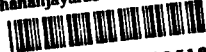


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**A SURVEY OF THE TRADE IN RUBBER
MANUFACTURED GOODS.**

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TRADE SURVEY.—RUBBER MANUFACTURED GOODS.

We, the Imperial Economic Committee, appointed by the Governments of the United Kingdom, the Dominions, India, and the Colonies and Protectorates, acting under a Resolution of the Imperial Conference of 1926, beg leave to present to the Governments of the Empire this our fourteenth report—A Survey of the Trade in Rubber Manufactured Goods.

I.—INTRODUCTION.

1. Under the resolution of the Imperial Conference of 1926, which renewed our Mandate, we have been directed by the Governments of the Empire to prepare a survey of Empire trade in rubber manufactured goods.

2. This survey follows on the lines which we adopted in our eleventh report—A Survey of the Trade in Agricultural Machinery.

3. As in the case of our previous trade survey, we have found, in the course of our enquiry, that interpretation of the trade statistics by those of wide experience of the trade was needed. We acknowledge the assistance we have received in this respect from the officials of the Governments of the United Kingdom and other parts of the Empire, from the India Rubber Manufacturer's Association, from the Research Association of British Rubber Manufacturers, and from the Rubber Growers' Association.

A.—THE COMPETITIVE POSITION.

II.—COMPARISONS OF THE STATISTICS OF DIFFERENT COUNTRIES.

Differences
in com-
pilation.

4. We have found very great difficulties in comparing the published statistics concerning the trade in rubber goods in the various countries, on account of important differences in classification and compilation. In the note in Appendix III to this survey we have detailed the more significant of these difficulties.

Statistics
of produc-
tion.

5. As regards production it is impossible to present any comparisons. Statistics of production are not published by some of the chief manufacturing countries. In those instances in which production figures are published, the Census of Production has not been held in the same year, nor, what is more important, in a recent year. The rubber industry is advancing with such rapidity that statistics very quickly become out of date and thus cease to have any important significance.

Imports and
Exports.

6. Statistics of imports and exports naturally form the basis of a trade survey, but in the rubber manufacturing industry, and

particularly in the trade in rubber tyres, comparisons based on these trade returns must be qualified by considerations of the organisation of the industry. These considerations we deal with in the section on the rubber tyre industry below.

III.—CHARACTERISTICS OF THE RUBBER INDUSTRY.

7. At times the rubber manufacturing industry is referred to as if it were synonymous with the tyre industry. This loose description has this justification; about 75 per cent. of the raw rubber used in industries in the world is absorbed in the manufacture of tyres. Rubber, however, enters into the manufacture of many different articles, some of which, under no ordinary system of trade classification, would be treated as rubber goods. It is used in the manufacture of :—

Variety of
Manu-
factures.

(a) Tyres—pneumatic and solid.

(b) Mechanical goods—belting, hose, tubing, valves, washers, and packing.

(c) Footwear—boots, shoes, soles and heels.

(d) Miscellaneous—

Waterproofed goods—apparel and fabric.

Surgical and hygienic—surgeons' and other gloves, syringes, douches, hot-water bottles, sponges, water and air beds.

Sports—both indoor and outdoor—golf, tennis, football, bathing caps.

Toys—balls of all colours, dolls, models, aquatic toys, balloons.

Rubber thread—for elastic webbing.

Stationery—rubber bands, erasers.

Hard rubber (vulcanite, ebonite, etc.)—for electrical apparatus, telephones, switchboards, wireless; for fountain pens and parts of surgical and hygienic requisites such as nozzles, stoppers, handles.

Electrical insulation—cables, wires.

Noise and vibration insulation—shock absorbers on railways, motor vehicles, aeroplanes—road surfaces.

Floor covering and matting—in houses and buildings, in cars, ships, aeroplanes.

Decorative purposes—artificial flowers, ornaments.

8. Although rubber forms an essential part of all of these goods, yet they differ widely not only in the quantity of rubber used in them, but also in the proportion of the cost of the rubber used to the cost of the finished article. In tyres both the quantity of rubber used and the proportion of its cost to that of tyres is considerable. In waterproofed apparel the quantity of rubber used

Varying
proportion
of rubber
used in
Manufac-
ture of
different
articles.

in each garment is small. In electrical cables and wires the cost of the rubber used for insulation forms but a small part of the final cost.

To consolidate the trade statistics for all these greatly differing industries as if they were all equally important branches of a rubber manufacturing industry would clearly be of no value. We therefore, later in this report, deal separately with those sections—tyres, mechanical rubber goods, rubber footwear and rubber soles and heels—for which separate figures are available in the trade returns of the more important manufacturing countries and then bring together in a separate section the information we have been able to collect regarding the other miscellaneous uses of rubber. We have omitted any detailed treatment of the trade in wires and cables, in which articles rubber forms only a small fraction of the final cost.

Dependence
on other
industries.

9. A brief consideration of the uses of rubber enumerated in paragraph 7 brings out another characteristic of the industry—its dependence on other industries. Certain of the articles mentioned there, frequently many of less importance such as rubber balls, erasers, fountain pens, hot-water bottles, are in demand by the public independently of the fluctuating conditions in other industries, but for many of the main uses to which rubber is put, as for instance in belting, in valves, in electrical installations, in telephones, in wireless and even in tyres, the progress of the rubber manufacturing industry largely depends on the progress of other industries, such as the development of the telephone service or the enterprise of the motor car trade. The rate of development of the rubber manufacturing industry in any country is thus dependent to a great extent on the rate of development of other industries over which it can exercise no control. In tyres, for example, a contract for first equipment of a car has an added importance to the tyre manufacturer from the advertisement it gives him when the car is sold. Thus tyre manufacturers in countries in which the motor car industry is rapidly extending have an advantage over those in which progress is not so rapid.

Dominant
position of
the United
States.

10. The tyre industry of the United States possesses an almost overwhelming advantage on account of the size of the home market for motor vehicles. During 1926, 1927 and 1928 more than 78 per cent. of the motor vehicles registered in the world were in the United States, while the American share in the world production of motor vehicles, has been during the same period 85½ per cent. in 1926, 81 per cent. in 1927 and 83½ per cent. in 1928. In motor vehicles the United States also has a large share in the world export trade. That share, including assemblies in foreign countries, was 69 per cent. in 1926, 80½ per cent. in 1927 and 84 per cent. in 1928. The tyre industry largely follows the motor vehicle trade and the United States thus has also a dominating

position in the tyre industry of the world. In the years 1925 to 1928, 54 per cent. of the crude rubber used industrially in the world was utilised in the manufacture of tyres in the United States. In those years, United States industries used, in the manufacture of all kinds of rubber goods twice as much crude rubber as the industries of the rest of the world.

11. The tyre section stands apart from most of the other sections of the industry in other particulars than in the quantity of rubber it absorbs. It is on the whole a modern development of the trade and requires large scale units for economical production. It demands a widespread sales organisation in which the trade is sufficiently large to permit of specialisation. The number of firms competing for world trade are comparatively few in number. Many of these own branch factories or have working arrangements with factories in countries other than those in which the parent company is domiciled. The British Goodrich Company was established in England in May, 1924, and during 1927 and 1928 several other foreign manufacturers such as Michelin, Firestone, Goodyear, Pirelli and others have established factories in the United Kingdom for producing their own tyres. Similarly the Dunlop Tyre Company of Great Britain has branch factories or is in association with linked factories in the United States, Germany, France, Australia, Canada and Japan. These world-wide associations do not occur to a similar degree among manufacturers making other forms of rubber goods.

Special characteristics of the tyre industry.

12. Trade statistics of imports and exports do not reveal changes in policy on the part of the large firms of international character, who in their turn are more interested in the progress and developments of their competitors than in the totals of imports and exports of different countries. A change in policy of any one of these large firms may affect very notably the import or export trade figures of any given country in a particular year. A case in point has occurred recently in the United Kingdom.

Effects of policy of large firms.

As will be seen later in this report the average annual value of tyres and tubes imported into the United Kingdom in the four years 1924 to 1927 was £3,450,000. In 1928, due mainly to the opening in the United Kingdom of factories owned or controlled by foreign firms, recorded imports fell to less than £1,000,000. Even if, in order to avoid any overstatement of the effect on imports caused by this change of policy on the part of these foreign firms, it be assumed that all imported cars were landed with a full new equipment of tyres (which is not the case), and that these were omitted from the recorded imports of tyres, the total imports of tyres could not exceed £1½ millions as compared with an average of nearly £3½ millions in the preceding years. Conversely a change in policy of these large firms as a result of which they should close their local factories in the United Kingdom might lead to another expan-

sion in imports. Considerations of the prospects of the market or of the incidence of import duties in a particular country will weigh with these firms in reaching a decision to establish factories in that country. Thus, in the case we have quoted, the Goodrich Company had been established and the Michelin Company had commenced work on their factories in England prior to the imposition of the 33½ per cent. ad valorem import duty on the 12th April, 1927, whilst the other foreign firms commenced work on their factories after that date.

13. Another instance of the manner in which figures of exports and imports may be temporarily affected by causes other than those of true market demand is furnished by the exports of tyres from the United States in 1924 and in 1925. Exports of outer covers were 28 per cent. higher in 1925 than in 1924. To some extent this was due to a true increase in demand, but it was also largely due to the decision of the Ford Company to equip their cars with low pressure instead of high pressure tyres. Tyre manufacturers in the United States were therefore compelled to reduce rapidly their stocks of tyres of the old type and in doing so unloaded them on foreign markets.

Different considerations in tyre industry and general rubber manufactures.

14. In analysing the import figures of tyres in different countries care has clearly to be taken to avoid ascribing to changes in demand, variations which may be due to entirely extraneous causes. Similar considerations do not occur to the same extent in regard to other kinds of rubber goods. In the first place the factories which supply them are not organised on a similar scale. In fact for making some of these goods to meet a local demand a small factory involving comparatively small initial expense—some £4,000—is sufficient. Further, sales organisation is not under the control of the manufacturer to the extent that it must be in the tyre trade, in which arrangements for local stocks, service and advertisement are important. Many of the other rubber goods must necessarily be sold to other industries, as for instance belting. In some cases they must be sold through factors or merchants specialising in the needs of different classes of retailers. Thus, for example, hot-water bottles are sold through those supplying chemists' shops, rubber bands and erasers through dealers in stationery stores, and water-proofs through the channels supplying drapers and clothiers. This side of the industry thus differs entirely from that of tyres both in the scale of its organisation, in the methods of sale and distribution of its products and in the degree to which standardisation in manufacture has been attained.

Arrangement of the Survey.

15. This survey therefore deals with a varied industry for several sections of which detailed information regarding conditions in competing countries is not forthcoming. We deal first and briefly with the growth of the rubber producing industry and the absorption of raw rubber by industry in the chief manufacturing

countries. These figures afford the only means of measuring the progress of the rubber manufacturing industries as a whole, whether in competing countries or in the world. We then compare the exports of the most important manufacturing countries, notably the United Kingdom, Canada, the United States and Germany in tyres, "mechanical" rubber, footwear and miscellaneous goods. Owing to the peculiarity in its statistics the exports from France cannot be put in the same mould for purposes of comparison and have to be treated separately. We then give further notes on the industries in these countries as well as in Italy, Belgium, Japan, and Australia, in which the manufacture is of importance but the export trade is not so large as in those first mentioned. We close the survey with some brief notes on labour, standardisation, research and tendencies in the Rubber Industry.

IV.—GROWTH OF THE RUBBER MANUFACTURING INDUSTRY.

16. The rubber manufacturing industry as we know it to-day is of comparatively recent growth. It is true that it had its historical beginnings in the remote past. Mr. Porritt in his "Early History of the Rubber Industry"* states, on the authority of the historian Antonio de Herrera, that Christopher Columbus, during his voyage to the New World between 1493 and 1496, observed the natives of Haiti using in their games balls prepared from the gum of a tree. Whatever justification there is for the assumption that this was rubber, it is certain that the Spanish conquerors in Central and South America speedily became acquainted with the local custom of coating garments with rubber and of fashioning from it crude articles such as bottles and shoes. These uses were not, however, introduced into Europe until some 250 years later when the French began to investigate the possible uses of the rubber latex. By the end of the eighteenth century, chiefly as the result of researches by French scientists, the general properties of rubber became known but the lack of solvents and suitable machinery prevented any considerable use of the material. Even by 1840 the imports of crude rubber into the United Kingdom only amounted to 332 tons. The real beginning of the modern rubber manufacturing industry may be said to date from 1845, by which year the standard processes for the manufacture of rubber goods had been discovered, almost entirely as the result of British invention. These improvements in processes led to a steadily widening use of rubber, the imports of which into the United Kingdom in 1870 reached 7,605 tons. In 1875, rubber plants were acclimatised in the East, but the plantation industry, of the growth of which we give an

Early
History.

* The Early History of the Rubber Industry, by B. D. Porritt, M.Sc., F.I.C., F.R.S.E., F.I.R.I., published by the Rubber Growers' Association, Inc.

account in Appendix I, met with little success until the development of cycling and motoring after 1900.

Effect of the motor industry on rubber production.

17. The rapid increase in the use of bicycles and tricycles followed the invention of the pneumatic tyre by J. B. Dunlop in 1888* and its still greater future use on motor vehicles was foreshadowed in 1895, when a car equipped with such tyres competed in the Bordeaux-Paris trials. These new uses for rubber caused a phenomenal growth in the plantation industry and a great improvement in the cleanliness and manner in which the raw product was marketed. In 1887, just before Dunlop's invention, the gross exports of rubber from producing countries was estimated at 17,280 tons, of which anything from a quarter to a third was dirt and impurities. Thirteen years later in 1900 the total world supply had reached 40,000 tons of clean rubber and a small quantity of plantation rubber—4 tons—appeared for the first time in London as a marketable product. Meanwhile the price, which in 1887 had averaged 2s. per lb., had risen, in 1900, for Fine Para to 4s. 3d. and for poorer qualities to 2s. 5d. After another 13 years, in 1913, plantation rubber accounted for 47,600 tons out of a world production of 108,000 tons. Fifteen years later, in 1928, the production of plantation rubber was 620,168 tons out of a world total of 649,674 tons. The figures for recent years are as follows:—

World Production of Rubber.¹

—					Plantation.	Brazil.	Other (Africa and Central America).	Total.
					tons.	tons.	tons.	tons.
1913	...	...	...	...	47,618	39,370	21,452	108,440
1919	...	...	...	...	285,225	34,285	7,350	326,860
1925	...	...	...	...	481,955	27,386	6,735	516,076
1926	...	...	...	...	576,955	26,433	11,390	614,778
1927	...	...	...	...	567,504	30,952	6,740	605,196
1928	...	...	...	...	620,168	24,556	4,950	649,674

¹ Figures supplied by the India Rubber Manufacturers' Association.

The production of crude rubber in 1929 is estimated at 860,000 tons, of which some 835,000 tons would be plantation and 25,000 tons wild rubber.

V.—ABSORPTION IN DIFFERENT COUNTRIES.

Distribution of crude rubber.

18. A trade estimate of the quantities of crude rubber bought by the manufacturing industries in different countries has

* An earlier invention of a pneumatic tyre by R. W. Thomson in 1845 had borne no commercial results.

been supplied to us by the Rubber Grower's Association. It is possible that these figures, except as regards the United States, slightly underestimate the quantities of crude rubber actually used in those industries in 1928, as many manufacturers allowed their normal stocks to be depleted in that year, expecting to replenish them more cheaply in 1929, when it was anticipated that the accumulations inside the "restriction area" would come to market. The estimate is as follows:—

*Absorption of Crude Rubber by the Industries of
different countries.*

Country.	1925.	1926.	1927.	1928.	1929.	Percentage off-take, in 1929.
United States ...	390,000	365,000	375,000	440,000	470,000	58.36
United Kingdom	30,100	39,700	44,800	48,500	72,000	8.94
France ...	37,500	36,900	36,000	38,000	61,800	7.67
Germany ...	33,900	22,800	38,900	37,900	49,100	6.10
Canada ...	19,800	20,200	26,400	30,900	35,500	4.41
Japan ...	11,700	17,100	18,700	25,000	34,000	4.22
Italy ...	11,400	9,800	11,300	12,400	16,200	2.02
Australia...	5,000	9,000	9,500	8,400	16,000	1.99
Russia ...	7,500	6,800	12,500	8,000	12,700	1.58
Belgium ...	2,900	2,500	6,500	7,900	9,400	1.17
Austria and Hun- gary.	2,500	3,000	3,300	3,500	4,500	0.56
Spain ...	1,500	2,200	2,100	3,000	3,000	0.37
Scandinavia ...	2,900	3,300	3,400	3,700	5,400	0.67
Netherlands ...	900	2,700	600	2,200	3,200	0.39
Other countries ...	3,000	4,000	5,000	8,000	12,500	1.55
Total ...	560,000	545,000	594,000	677,000	805,300	100.00

The "other countries" in 1928 included Czecho-Slovakia and Poland (each 3,000 tons), Finland (800 tons), Latvia and Esthonia (700 tons), Denmark (600 tons), South Africa and Algeria (400 tons each), China (300 tons), Argentina and Yugo-Slavia (200 tons each) and Greece, Portugal, Rumania and Switzerland (50 tons each).

* The figures for the United States are based on returns from manufacturers collected by the Rubber Association of America; those for the United Kingdom on net imports, adjusted for the variation of stocks in the public warehouses in London and Liverpool; those for other countries on net imports.

The figure of 8,000 tons for Russia is much less than the Russian official figures for the year ending 30th September, 1928, would indicate, but it is all that can be traced as going to that country during 1928. It is possible, however, that some of the rubber imported into the adjacent countries (e.g. Poland) was re-exported to Russia, but the re-exports from these countries are not published. It is unlikely that the rubber manufacturers in Poland used 3,000 tons in 1928.

This total for 1928 is greater than the amount shown in paragraph 17 to be the total world production in that year, as it includes withdrawals from stocks accumulated in previous years.

In some of the figures above, including those for France, Italy, Canada and Japan small quantities of Gutta-Percha, Balata, etc., are included. These are probably between 2,000 and 3,000 tons. Some 96 per cent. of the crude rubber produced is absorbed by the industries of 10 countries. It is with the industries in these 10 countries— with the exception of Russia for which no recent information has been obtained—that we shall deal in this survey. The predominant position of the United States which alone absorbs about 60 per cent. of the production of crude rubber stands out clearly.

VI.—USE OF RUBBER IN DIFFERENT BRANCHES OF THE INDUSTRY.

In the
United
Kingdom.

19. Crude rubber is absorbed in the various branches of the industry in very different proportions in different countries. Figures based on manufacturers' returns are available only for the United States. It is estimated that about 75 per cent. of the raw rubber absorbed in the United Kingdom industry is used in the manufacture of tyres. The remainder is about equally divided between mechanicals (belting, hose, packing, etc.); waterproof garments and rubber footwear; sports, surgical and hard rubber goods; and the requirements of other industries such as the insulation of wires and cables in the electrical industry, and elastic for the textile industry.

In the
United
States.

20. The following table, published by the Rubber Association of America shows how the rubber used in the United States is distributed. The figures represent over 90 per cent. of the rubber industry of the United States.

Crude rubber consumed in the manufacture of rubber products in the United States during 1928.

<i>Tyres and Tyre Sundries..</i>	<i>Tons.</i>	<i>Percentage of Total.</i>
Automobile and Motor Truck Pneumatic Casings	271,487	66.70
Automobile and Motor Truck Pneumatic Tubes	56,403	13.90
Solid and Cushion Tyres	12,220	3.00
Tyre Sundries and Repair Materials ...	6,101	1.50
Bicycle Tyres (Single tubes, casings and tubes)	966	0.20
Other Solid Tyres	634	0.15
Motor cycle Casings and Tubes	412	0.10
Aeroplane Casings and Tubes	116	0.05
Total—Tyres and Tyre Sundries ...	348,339	85.60

<i>Other Rubber Products.</i>	<i>Tons.</i>	<i>Percentage of Total.</i>
Mechanical Rubber Goods	17,894	4.40
Boots and Shoes	16,894	4.15
Heels and Soles	5,591	1.40
Insulated Wire and Insulating Com- pounds	3,444	0.80
Miscellaneous rubber articles n.e.i. ...	3,214	0.80
Rubberised Fabrics n.e.i.	2,237	0.50
Druggist Sundries, Medical and Sur- gical rubber goods	1,577	0.40
Sporting goods, Toys and Novelties ...	1,380	0.40
Stationers' Rubber Goods	1,271	0.30
Rubber Clothing	1,248	0.30
Hard Rubber Goods	1,110	0.30
Rubber Flooring	1,062	0.30
Automobile Fabrics	961	0.20
Bathing Apparel	627	0.15
Total—Other Rubber Products ...	58,510	14.40
Grand Total	406,849	100.00

21. Thus, in the United States more than 85 per cent. of the rubber absorbed in industry is used in the manufacture of tyres. In other countries the proportion is somewhat less. In the United Kingdom, Canada, Australia and France it is probably between 70 per cent. and 75 per cent. In most other countries it is below this figure, but in all the important manufacturing countries it is the chief use to which rubber is put. As already stated it is estimated that the tyre industry of the world absorbs some 75 per cent. of the total production of crude rubber. The needs of all the other varied rubber industries are satisfied by 25 per cent. of the crude rubber available.

VII.—RECLAIMED RUBBER.

22. The foregoing paragraphs deal with the production and distribution of crude rubber. Reclaimed rubber is also used in industry, although experience has not been sufficient to prove that it is a satisfactory substitute for crude rubber. No countries except the United States, in which rubber reclaiming has been further developed than elsewhere, compile statistics of the quantities absorbed. In the United States 150,000 tons of reclaimed rubber were used in 1925 in addition to the 440,000 tons of crude rubber. For certain minor products reclaimed rubber is said to be not only

Use in th
industry
generally.

more economical in price but also more suitable. In the United States it is largely used in combination with crude rubber in the manufacture of hose and packing, mats, footwear, heels and soles and hard rubber goods. The proportion tends to decrease in times of low prices for crude rubber, but its use is now firmly established. Both in scrap and reclaimed rubber a certain amount of international trade has grown up, particulars of which are given in Appendix II.

Use in
the tyre
industry.

23. As far as can be ascertained, it is only in the United States that reclaimed rubber has been used in the manufacture of tyres. Following the high prices in 1925, when crude rubber touched 4s. 8d. a pound, the tyre manufacturers in the United States produced in 1926, and again in the early part of 1927, large numbers of cheap, second grade outer covers containing a high proportion of reclaimed rubber. It is calculated that for every 100 pounds of crude rubber used in 1926 in tyre manufacture in the United States 20 pounds of reclaimed rubber were used. Experience soon showed that these cheap second grade tyres, which were sold as such, were unsatisfactory and the demand turned in favour of the high quality article. Although the use of reclaimed rubber in the manufacture of tyres in 1926 and 1927 temporarily reduced the demand for crude rubber, it increased it during 1928 and 1929 through the need for more early renewals.

VIII.—MOTOR TYRE INDUSTRY.

Inter-
national
competi-
tion.

24. Competition in international trade in tyres is between seven large companies rather than between industries in different countries. One of these is of British origin, Dunlop, one of French, Michelin, and five of United States, Goodyear, Firestone, Goodrich, the United States Rubber Company and Fisk. Two others of note are Pirelli of Italian origin and Englebert of Belgium. There are many smaller manufacturers, but they do not enter largely into international trade and the volume of their oversea trade does not materially affect the position. The seven big competing firms all work on the same principle of large scale production and the establishment of factories in countries overseas. The factories established overseas employ local labour and other services, but their activities and policy are, in the last resort, directed by the authorities controlling the home or foundation company. These decisions of policy may greatly affect the output and export returns of tyres of a particular manufacturing country from year to year.

25. It would clearly be misleading to ignore the effect of changes of policy on the part of these firms when analysing the statistics of export or import trade of different countries. These are not, however, the only considerations which must be borne in mind in an examination of the national statistics of the trade in tyres.

26. The decision of an important car manufacturer to open a factory in another country may result in an increase in the export of tyres from the country in which the parent car firm is operating and an increase in the import of tyres in the country in which the branch car factory has been established, although no real change in the volume of trade in tyres has resulted. Thus the sudden rise in French exports of tyres to England in 1926 was in part due to the establishment in England in that year of branch works of the Citroën car company. Michelin supplied the main Citroën works in France from its French factory and continued to supply the first equipment to Citroën cars manufactured in England. As, however, Citroën cars had previously been arriving in England fitted with Michelin tyres, the additional exports of tyres from France to England, resulting from the change in place of delivery did not represent any true increase in the French export trade in tyres. Changes in the practice of shipping cars with or without tyres may have similar effects on the trade returns.

Effect of branch factories on national trade statistics.

27. In a different category come the variations in the trade returns caused by changes in stocks arising either from changes in the agencies of distribution or from changes in car design.

Effect of transfers of stocks.

28. The imminence of a tariff duty or an alteration in the rate of tariff may also temporarily affect the flow of exports and imports. Large shipments of tyres from the United States arrived in the United Kingdom too late to enter duty free when duties on tyres were imposed, in 1927, in the United Kingdom. These tyres were transferred to the Irish Free State which at that time was a free market. The imports of the Irish Free State were therefore temporarily inflated.

Effect of imminence of tariff duties.

29. Statistics of values of the exports of tyres are also affected in varying degree according to the extent to which the tyres exported are shipped in fulfilment of "first equipment" orders. "First equipment" orders are important to tyre manufacturers, not only for the advertisement they afford, but as providing large running orders. It is customary therefore to supply "first equipment" orders at prices below those for replacement. The difference between the two scales of prices is probably greater in the United Kingdom and in the United States than in France. Where car manufacturers have established assembly plants in other countries, the tyre manufacturer which supplies the parent company with "first equipment" frequently holds the contract for supplying the foreign branch, either at the price charged for first equipment in the country of origin or at the lowest rate prevailing for first equipment business in the country in which the assembly works are situated. As first equipment prices are below those for replacement, the recorded value of exports from a country which is making large shipments for first equipment, will appear

Different value of "first equipment" and "replacements."

low in comparison with those of another country in which that trade is not so important.

Favourable buying of raw rubber.

30. Values of exports may further vary considerably from time to time according to the state of internal competition in the exporting country and also if the manufacturers of the country have been able to buy rubber at favourable prices. The price of raw rubber has fluctuated considerably in recent years, and, as manufacturers buy rubber ahead of their requirements to the extent of 50 to 70 per cent. it can happen that a firm may have obtained its raw material at a relatively low price. Rubber at 1s. a pound represents about 40 per cent. of the works cost.

Interpretation of national statistics.

31. Conclusions regarding the progress of an industry in a particular country drawn from a mere comparison of the trade statistics of exports and imports for two or three years may therefore be vitiated by all or some of these causes. None the less, the survey of national statistics over a period of years furnishes very important information regarding the capacity of the importing markets, the indications of their growth and strength and the nature of the competition therein. It is these aspects of the statistics which we stress in the paragraphs we devote to a survey of the rubber tyre industry.

Chief manufacturing countries.

32. Concurrently with a great expansion in the production of tyres in countries already manufacturing those goods before the War, the number of countries in which they are now manufactured has also increased. Motor tyres are now manufactured in 20 countries namely:—

In the British Empire : United Kingdom, Canada, Australia, South Africa and British Malaya.

In foreign countries : United States, France, Italy, Belgium, Japan, Germany, Czecho-Slovakia, Austria, Hungary, Denmark, Sweden, Russia, the Netherlands, Spain, and Mexico.

Of these countries only eight enter seriously into competition in international trade. They are the United Kingdom, Canada, the United States, France, Italy, Belgium, Japan and Germany. Australia practically reached, in 1927, a stage of self-sufficiency in tyre manufacture. The general picture is therefore one of fairly rapidly growing world demand, which is gradually being satisfied more and more in many countries by increasing local production, but still leaving a large surplus demand unsatisfied, for which at present eight countries chiefly compete, but for which more may compete in the future.

International trade in outer covers.

33. The shares of these eight countries in each branch of the tyre trade cannot be shown statistically owing to differences in classification in their returns of export trade. France until recently, Italy, Belgium and Japan, for instance, make no distinction between outer

covers and inner tubes and only record totals of weight exported and not numbers of tyres and tubes.

The United States Commerce Department, however, publish a table showing for all these eight countries the number of outer covers exported by each of them. This table furnishes the nearest approach to a comparative statement available. The compilers of this table have not made allowance for the fact that since the 12th April, 1927, the returns of the United Kingdom exclude tyres exported with complete vehicles, chassis or wheels. The figures given for the United Kingdom in 1927 and 1928 in the table which is reproduced below have therefore been increased by the estimated number of outer covers so exported:—

Motor Vehicle Outer Covers exported from the Principal Producing Countries.

(Thousands of covers.)

From	1919.	1921.	1923.	1924.	1925.	1926.	1927.	1928.
United Kingdom	484	163	397	550	872	904	983	1,047
Canada ...	185	119	480	500	848	1,152	1,679	1,675
United States...	1,000	840	1,363	1,389	1,770	1,654	2,811	2,693
France* ...	655	1,079	1,510	1,677	1,872	1,902	2,112	1,812
Italy ...	213	227	490	667	801	720	726	744†
Belgium ...	44	30	72	86	144	193	296	447
Japan‡ ...	155	94	135	118	295	138	165	202†
Germany ...	25	150	252	144	175	209	154	180.
Total ...	2,761	2,702	4,689	5,131	6,777	6,872	8,926	8,000

* Estimated from weight on the basis of one outer cover to 13 kilogs. of total exports of tyres and tubes.

† Estimated on the basis of eleven months returns.

‡ Estimated from weight.

This table shows:—

(a) the rapid growth of the export trade during the last eight years, in spite of increased local manufacture;

(b) the phenomenal development of Canadian and French exports;

(c) the great advance made by the United Kingdom after the disastrous slump of 1921;

(d) the great increase in Belgian exports which are rapidly bringing that country into the group of principal exporting countries;

(e) the exceptional exports from the United States in 1927 and 1928.

In view of the differences in the classification of exports from the chief producing countries, it is not possible to prepare a comparative table analysing the destinations of these exports. The estimates given in the above table of the total number of outer covers exported is reasonably accurate, but estimates calculated on similar bases and applied to the exports to particular markets would be very misleading.

Inner tubes,
solid tyres,
bicycle
tyres.

34. Tables prepared on the basis of similar estimates regarding inner tubes for motor tyres, solid tyres and bicycle tyres would be less accurate. They would probably furnish no further information, except that in exports of bicycle tyres, the United Kingdom, Belgium and Germany would be in higher relative places. Motor car outer covers form by far the most important and valuable branch of the tyre industry and the relative importance of the exporting countries in this trade is consequently of chief significance.

Comparison
of exports
of all kinds
of tyres.

35. Although it is not possible to analyse in one form the exports of all kinds of tyres from these eight countries, a comparison of the total value of the exports from these countries, to the chief destinations can be made. In addition to the reservations made in paragraphs 22 to 30, it must be remembered that such figures of value are very differently constituted for different countries. The value of two bicycle tyres is much less than that of a set for a motor car. The export trade of a country may appear in the table to be comparatively small compared with that of other countries, yet it may none the less describe a very wide and extensive trade in the cheaper articles, perhaps cycle tyres.

The following table shows the countries to which any of the eight chief countries exported tyres exceeding £40,000 in value in 1928.

Markets for Tyres and Tubes, in 1928.
Arranged in descending order of value.

United Kingdom.*	Canada.	United States.	France.†‡
Total Exports ... (3,420)	(4,054)	(7,578)	(4,812)
Figures in brackets are values in £'000.			
India ... (417)	New Zealand (533)	Argentina ... (624)	Switzerland (520)
South Africa (319)	India ... (344)	Spain ... (384)	Spain ... (426)
Irish Free State (252)	Argentina (338)	Germany ... (365)	Belgium ... (383)
New Zealand (176)	United Kingdom (336)	Brazil ... (333)	United Kingdom (288)
Argentina (170)	South Africa (336)	Denmark ... (318)	Italy ... (211)
Poland (and Danzig) (155)	Brazil ... (279)	Mexico ... (316)	Australia ... (194)
British West Africa (145)	Dutch East Indies (230)	Philippines (312)	India ... (182)
Sweden ... (106)	Denmark ... (90)	Japan ... (310)	Morocco (165)
Denmark ... (106)	Sweden ... (81)	Italy ... (239)	
Spain ... (94)	Belgium ... (80)	India ... (229)	
Italy ... (92)	Belgium ... (80)	Belgium ... (223)	
Netherlands (86)	British West Indies (70)	Netherlands (186)	
Straits Settlements (86)	Uruguay ... (69)	Colombia ... (185)	
France ... (77)	Venezuela (61)	Dutch East Indies (158)	
Belgium ... (68)	Straits Settlements (54)	British Malaya (155)	
Ceylon ... (64)	Australia ... (53)	Poland (and Danzig) (153)	
Brazil ... (62)	Switzerland (45)	United Kingdom (135)	
Germany ... (57)	Chile ... (43)	Australia ... (132)	
Dutch East Indies (54)		Rumania ... (119)	
Australia ... (46)		Chile ... (116)	
Czecho-Slovakia (45)		Czecho-Slovakia (109)	
		Switzerland (108)	
		Austria ... (104)	
		China ... (103)	
		Uruguay ... (98)	
		South Africa (92)	
		Venezuela (89)	
		Finland ... (80)	
		Peru ... (79)	
		France ... (79)	
		Norway ... (72)	
		Greece ... (61)	
		British West Africa (60)	
		Canada ... (52)	
		Egypt ... (51)	
		New Zealand (48)	
		Portugal ... (46)	
		British East Africa (41)	

For footnotes see following page.

Italy.†	Belgium.	Germany.	Japan.
(2,416)	(1,494)	(1,213)	(572)

Figures in brackets are values in £'000.

India and Ceylon (221)	Netherlands (270)	Argentina (135)	China ... (234)
Spain ... (200)	France ... (252)	Czecho-Slovakia (121)	Dutch East Indies (158)
Argentina (168)	Germany ... (208)	Dutch East Indies (109)	Straits Settlements (93)
Brazil ... (144)	United Kingdom (108)	Denmark ... (107)	Kwantung Province (47)
Belgium ... (144)	Switzerland (98)	Spain ... (102)	
Dutch East Indies (136)	Italy ... (64)	India ... (100)	
United Kingdom (131)	Sweden ... (56)	Austria ... (81)	
Denmark ... (115)		Netherlands (64)	
Australia ... (64)		Switzerland (49)	
		British Malaya (44)	
		Jugo-Slavia (44)	
		United Kingdom (43)	
		Hungary ... (40)	

* The United Kingdom returns do not show exports to each country under all the headings comprising tyres and tubes. Some exports of these goods to the countries mentioned above may therefore have been included under the omnibus headings "Other British countries" and "Other foreign countries." The amounts by which the above figures fall short of the total in any case are comparatively very small.

† Calculated from weight.

‡ The annual trade returns of France for 1928 are not yet available. The details given are taken from the monthly return for December 1928 which gives provisional figures for the whole year. Only a few of the most important markets for tyres are given in this return. In 1927, French exports of tyres to 22 different countries exceeded £40,000 in value.

This table shows:—

(a) the very wide distribution of this trade throughout the world. No less than 50 countries appear in this table as being destinations for tyres to the value of £40,000 in 1928;

(b) the importance to the United States of the European and South American markets;

(c) the wide distribution of the exports of the United Kingdom, Canada, the United States and France;

(d) the great importance of the Empire markets to the United Kingdom and Canada.

(e) Russia (U.S.S.R.) is a small market for the chief exporting countries and is not included in this table.

36. The countries to which the countries shown in the foregoing table exported the greatest value of tyres (both pneumatic and solid) and tubes in 1927 and 1928, and the total value of such exports were :—

<i>Exported to.</i>	1927.	1928.
	£	£
India	1,687	1,493
Argentina	1,744	1,435
United Kingdom	3,256	1,041
Dutch East Indies	864	845
Brazil	1,025	818
New Zealand	781	757
Denmark	727	736
Netherlands	829	606
Australia	1,020	489
British Malaya	513	432

The shares of those countries, in 1928, in these total exports were, in each case, as follows :—

Importing Market.	United Kingdom.	Canada.	United States.	France.	Italy.	Belgium.	Germany.	Japan.
			Percentage share.					
EMPIRE :—								
India	27.9	23.0	15.3	12.2	14.8	—	6.8	—
United Kingdom	—	32.2	12.9	27.7	12.7	10.4	4.1	—
New Zealand	23.3	70.4	6.3	—	—	—	—	—
Australia	9.4	10.8	27.0	39.7	13.1	—	—	—
British Malaya	19.9	12.5	36.0	—	—	—	9.8	21.6
FOREIGN :—								
Argentina	11.9	23.6	43.4	—	11.7	—	9.4	—
Dutch East Indies	6.4	27.2	18.7	—	16.1	—	12.9	18.7
Brazil	7.5	34.2	40.7	—	17.6	—	—	—
Denmark	14.4	12.2	43.2	—	15.6	—	14.6	—
Netherlands	14.3	—	30.6	—	—	44.5	10.6	—

37. The position of the United Kingdom market which in the preceding paragraph was shown to be, in 1927, the largest single importing market in the world, has undergone a complete change. The extent of the change may also be seen in the import returns of the United Kingdom. The total value of the imports of tyres and tubes into the United Kingdom during recent years has been as follows :—

Change in the position of the United Kingdom market.

Imports of Tyres and Tubes into the United Kingdom.

Year.	£000.
1924	3,037
1925	3,867
1926	4,849
1927	3,125
1928	973
1929	616

Although the marked decline in imports in 1927, 1928 and 1929 shown in this table, is partly due to a change in the method of recording the statistics (see the following paragraph), it is still more due to the joint effect of the recent establishment of factories in the United Kingdom by oversea manufacturers and of the imposition of a duty in 1927.

Imports of
the United
Kingdom.

38. The following table shows the value of the imports into the United Kingdom of all kinds of rubber tyres and tubes from the six principal countries from which these are imported. Imports from Empire and foreign sources are also shown. The import figures for the six countries may not be complete, as the returns of the United Kingdom do not specify the imports from each of these countries under all the headings, and there may consequently be a small amount of imports from some of these countries included under the headings "from other British countries" and "from other foreign countries." These amounts would be small enough not to affect the total figures materially.

Imports of Rubber Tyres and Tubes into the United Kingdom.

Imports from	1924.	1925.	1926.	1927*			1928.
				Jan./12th April.	13th Apl./ Dec.	Total.	
	£000	£000	£000	£000	£000	£000	£000
Total Empire ...	447	517	559	232	594	826	284
Total Foreign ...	2,590	3,350	4,290	1,657	641	2,299	689
Total Imports ...	3,037	3,867	4,849	1,889	1,235	3,125	973
Canada ...	418	498	539	225	591	816	281
United States ...	890	1,077	895	449	256	705	187
France ...	967	1,225	2,099	826	153	979	196
Italy ...	444	711	726	252	268	520	82
Germany ...	106	88	196	38	28	66	40
Belgium...	115	156	253	65	93	158	122

* From the 12th April, 1927, tyres and tubes imported into the United Kingdom have been liable to a 33½ per cent. ad valorem duty

From 13th April, 1927, the returns of the United Kingdom have ceased to include tyres and tubes imported with complete vehicles or chassis as part of their equipment, or fitted on wheels separately imported. The figures since this date cannot, therefore, be compared with those for earlier periods.

IX.—THE MECHANICAL RUBBER GOODS INDUSTRY.

39. The next most important branch of the rubber industry is that known technically as "mechanicals," which comprise driving-belts, hose, valves, packings and various shock-absorbers and other rubber goods used in connection with machinery. They form an important and growing branch of the rubber manufacturing industry. From the particulars published in the report of the Census of Manufactures : 1927, issued by the United States Department of Commerce, the value of "mechanicals" manufactured in the United States, has been as follows :—

Mechanical Rubber Goods.	1924.	1925.	1926.	1927.
	£000	£000	£000	£000
Belting	2,680	4,990	4,875	4,500
Hose	3,722	6,980	7,325	8,490
Packing	915	1,157	916	996
Other	*	*	*	6,520
Total	7,317	13,127	13,116	20,506

* Not available.

In the Preliminary Report on the Census of Production in Great Britain in 1924, the following particulars of the output of the manufacturers of mechanical rubber goods are given :—

Kinds of Goods.	Production 1924.		
	Quantity.	Value £000.	Percentage of total value of rubber manufactures.
Piping and Tubing : Hose	5,258,000 yds.	720	3.35
Piping and Tubing : Mechanicals	3,600 tons.	1,043	4.86
Machinery Belting	1,485 tons.	568	2.65

40. Comparatively few countries engage in the export trade in mechanical rubber goods. The chief exporting countries are the

Exporting Countries.

United Kingdom and Canada, in the British Empire, and the United States, Germany and France among foreign countries. Other countries, chiefly Czecho-Slovakia, Belgium, Italy and Austria, do a small export trade in certain of these kinds of goods, but the trade is mostly confined to their near neighbours.

Owing to differences of classification, detailed in Appendix III, it is not possible to compare the export trade of even the principal exporting countries in mechanical rubber manufactures as a whole. In the following sections on Machinery Belting and Rubber Hose, an analysis of the world export trade, as far as possible, is presented. The export returns of France, however, include all the mechanical rubber manufactures under one heading. The export trade of France in these goods, as well as in other kinds of rubber manufactures, have therefore been analysed in a separate section.

**Machinery
Belting.**

41. Belting for machinery may be made of canvas, leather or rubber. The United Kingdom has the largest share of the export trade in machinery belting as a whole, including therein belting made of leather, rubber, balata or fabric. This position is primarily due to the large share which the United Kingdom has in the export of canvas and woven belting. Taking all kinds of belting together the United Kingdom supplied 55 per cent. and 45 per cent. in 1920 and 1921 of all the machinery belting entering international trade. In 1927 the percentage had fallen to 34 per cent., the reduction being chiefly due to renewed competition since the war from European countries, to increasing exports from the United States and Canada and to growing local competition from small belting manufacturers in nearly every consuming market. The United States exported 24 per cent. of the total exports of machinery belting in 1927.

**(Increasing
trade in
rubber
belting.**

42. The world depression of 1921 and 1922 caused a great decrease in the exports of belting throughout the world. Since those years the quantity of belting exported from the 16 chief manufacturing countries of the world has steadily grown until in 1927 it very nearly reached the same figure as in 1920. But a change is coming over the kind of belting most in favour. A steadily increasing proportion consists of rubber or balata belting. This type of belting is largely used on elevators and conveyors. No distinction is made in the returns of many countries between rubber and balata belting, and consequently they have to be taken together when making comparisons. This change in demand is shown in the following table, which is based on the export figures of 16 countries; the United Kingdom, the United States, Germany, France, Belgium, Canada, Czecho-Slovakia, Netherlands,

Norway, Austria, Japan, Italy, Sweden, Switzerland, Denmark and Australia.

<i>Year.</i>	<i>Total Exports of Machinery Belting.</i>	<i>Exports of Rubber Belting.</i>	<i>Percentage.</i>
	1,000 cwts.	1,000 cwts.	
1920	265	84	35.6
1921	151	51	33.8
1922	185	63	34.0
1923	231	86	37.2
1924	233	87	37.3
1925	239	97	40.6
1926	241	98	40.7
1927*	252	108	42.9

* Estimated from slightly incomplete figures.

43. Nearly 80 per cent. of the rubber and balata belting entering international trade is exported by the four countries, the United Kingdom, Canada, the United States and Germany, of which the United States is the chief exporter and the United Kingdom the second. However, as the following table shows, the exports from the United Kingdom of this form of belting for which the demand is steadily increasing, did not, up to 1927, expand as rapidly as those from any of the chief competing countries.

Chief Countries exporting belting.

Exports of Rubber and Balata Belting.

Quantity—cwts.

—	1924.	1925.	1926.	1927.	1928.
United Kingdom	23,744	25,724	23,889	22,670	28,258
United States	31,800	36,400	37,200	44,600	43,636
Germany	—	6,426	6,643	8,875	13,411
Canada	Fiscal Year ended 31st March.			Calendar Year.	
	1925.	1926.	1927.		
	7,665	11,176	9,532	10,951	10,940

44. In 1927 the exports from these four countries were distributed as follows :—

Countries to which Rubber and Balata Belting, exceeding £5,000 in value, were exported in 1928 from any of the chief manufacturing countries :—

Chief markets in descending order. Figures in brackets are £000.

United Kingdom.	Canada	United States.	Germany.
Total Weight 28,258 cwts.	Total Weight 10,940 cwts.	Total Weight 43,635 cwts.	Total Weight 9,375 cwts.
Total value £463,910	Total Value. £96,893	Total Value £572,000	Total Value £127,500
South Africa (77)	Argentina ... (19)	United Kingdom (70)	Poland and Danzic (34)
India ... (50)	United Kingdom (16)	Mexico ... (49)	Denmark ... (23)
Argentina ... (30)	New Zealand (12)	Chile ... (37)	Czecho-Slovakia (16)
Australia ... (21)	Brazil ... (10)	Brazil ... (34)	Sweden ... (14)
Sweden ... (20)	Denmark ... (9)	Canada ... (32)	United Kingdom (13)
Irish Free State (17)	Australia ... (5)	South Africa (29)	France ... (10)
Brazil ... (16)	South Africa (5)	Argentina ... (27)	Austria ... (10)
New Zealand (15)		Australia ... (22)	Netherlands (10)
Netherlands (15)		Phillippines (20)	Italy ... (8)
Finland ... (12)		Sweden ... (18)	Rumania ... (7)
Canada ... (12)		Denmark ... (16)	Argentina ... (7)
Denmark ... (12)		Mozambique (16)	Brazil ... (6)
Spain ... (11)		India ... (16)	Switzerland (5)
Italy ... (9)		France ... (13)	Latvia ... (5)
France ... (9)		Peru ... (13)	
Belgium ... (8)		Belgium ... (13)	
Germany ... (8)		Cuba ... (12)	
Norway ... (8)		Bolivia ... (12)	
U.S.A. ... (6)		Japan ... (11)	
		Germany ... (9)	
		China ... (9)	
		Spain ... (9)	
		Finland ... (8)	
		Dutch East Indies (7)	
		Netherlands (6)	
		Uruguay ... (6)	
		Poland and Danzic (5)	
		Colombia ... (5)	
		Newfoundland (5)	

Principal countries importing belting.

45. The countries which imported over £40,000 worth of these goods from these four countries were, in 1928 :—

	£'000
South Africa	111
The United Kingdom	99
India	66
Brazil	66

Argentina	...	...	...	...	...	64
Denmark	...	...	...	...	...	60
Sweden	...	...	...	...	...	52
Mexico	...	...	...	...	...	49
Australia	...	...	...	...	...	48
Canada	...	...	...	...	...	44

Thus although rubber and balata belting is exported to nearly every country in the world, these ten countries received in 1928 53 per cent. of the exports from these four large exporters.

From the preceding analysis it will be seen that—

(a) the special mining industries in South Africa and Mexico afford large markets for this class of belting;

(b) United States exports are very widely distributed but are especially strong in Central and South America;

(c) 50 per cent. of the exports from the United Kingdom went to Empire countries;

(d) the bulk of the German export trade (over 70 per cent.) is with European countries, including the United Kingdom;

(e) the Canadian trade is concentrated in comparatively few markets.

46. The world export trade in rubber hose in 1927 was estimated to be 7,250 tons, valued at £1,380,200. The United States is the largest exporter, having exported nearly 44 per cent. by weight and 40 per cent. by value of the total world exports of rubber hose in 1927. Germany is the next in importance, having exported 22 per cent. of the total volume. The United Kingdom is third, having exported 13 per cent. Then follow France and Canada. Italy, Austria, Belgium and Czecho-Slovakia are also important producers. Rubber
Hose.

47. The United Kingdom has been consistently for some years the chief market for American rubber hose, having taken 19 per cent. of the total volume of United States exports of hose in 1925, 16 per cent. in 1926, 19 per cent. in 1927 and 15 per cent. in 1928. Nevertheless the production of rubber hose in the United Kingdom is large (page 89). Both imports and exports are considerable, but it is possible that they relate to different types of goods. The following table shows the imports and exports of rubber piping and tubing of the United Kingdom from 1925 to 1928. The re-exports are negligible. United
Kingdom
trade in
rubber hose.

Year.	Quantity—tons.				Value—£'000.			
	1925.	1926.	1927.	1928.	1925.	1926.	1927.	1928.
Imports	597	596	752	762	112	119	121	114
Exports	761	923	934	1,054	202	239	233	249

Chief
countries
exporting
rubber hose.

48. The following table shows the exports of rubber hose, in 1928, from four of the principal manufacturing countries, the United Kingdom, the United States, Germany and Canada. In the French official statistics, rubber hose is not specified. The table also gives the chief markets, in descending order of importance.

Countries to which Rubber Hose was exported in 1928 from the chief manufacturing countries.

United Kingdom.	Canada.	United States.	Germany.
Total £249,199	£52,904	£540,000	£365,700

Chief markets in descending order of value. Figures in brackets are £000.

India ... (44)	New Zealand (12)	United Kingdom (68)	Netherlands (63)
South Africa (39)	United States (10)	Mexico ... (41)	Switzerland (40)
Australia ... (20)	United Kingdom (10)	Canada ... (36)	United Kingdom (39)
Argentina (20)	South Africa (7)	South Africa (31)	Denmark ... (20)
Norway ... (11)		Cuba ... (26)	Sweden ... (19)
Irish Free State (11)		Japan ... (24)	Czecho-Slovakia (18)
New Zealand (8)		Australia ... (23)	United States (13)
Netherlands (6)		Chile ... (23)	Austria ... (12)
Chile ... (5)		France ... (23)	India ... (11)
Persia ... (4)		Venezuela ... (22)	Belgium ... (10)
Belgium ... (4)		Argentina ... (22)	Poland and Danzig (9)
France ... (3)		Brazil ... (19)	Brazil ... (9)
Denmark ... (3)		Dutch West Indies (17)	Argentina ... (9)
Spain ... (3)		Belgium ... (15)	Spain ... (8)
Egypt ... (3)		Colombia ... (13)	Norway ... (8)
Sweden ... (3)		Dutch East Indies ... (11)	Italy ... (7)
Ceylon ... (3)		Panama ... (10)	Chile ... (7)
Brazil ... (2)		Netherlands (9)	Uruguay ... (5)
Straits Settlements (1)		Peru ... (9)	France ... (5)
		Sweden ... (6)	Portugal ... (5)
		Spain ... (5)	Mexico ... (5)
			Hungary ... (4)
			Saar District (4)
			Rumania ... (4)
			Yugo Slavia (3)
			Dutch East Indies (3)
			Colombia ... (3)
			Lithuania ... (2)
			Egypt ... (2)
			China ... (2)
			Finland ... (2)
			Greenland ... (1)
			Japan ... (1)
			Cuba ... (1)
			Peru ... (1)
			Australia ... (1)

49. This table shows that—

(a) Most of the United Kingdom exports of rubber hose go to Empire countries. India took 17.7 per cent. of the total value, South Africa 15.7 and Australia 8.0. The most important foreign market was Argentina, which took 8.0 per cent. Thus the first four markets took 45 per cent., and three of these markets are in the Empire.

(b) Exports of rubber hose from Canada go mostly to Empire markets.

(c) German rubber hose is exported chiefly to European markets. Out of the 36 markets in the table, 20 (including the United Kingdom) are in Europe. Seven of the remaining markets are in Central and South America.

50. Rubber hose is produced in large quantities by Italian manufacturers, who supply nearly two-thirds of the local consumption. The locally made hose is used mostly for industrial purposes. Domestic production supplies the greater portion of the demand for rubber hose in Czecho-Slovakia, but the superior qualities are imported. Exports of Czecho-Slovakia increased from 10 tons in 1926 to 16 tons in 1927 and the chief markets were Germany, Belgium, Austria and Spain.

Minor
producing
countries.

Exports of rubber hose from Belgium increased from 98 tons in 1926 to 105 tons in 1927 and to 147 tons in 1928. Consumption of rubber hose in Austria is met largely by the local product which is of good quality.

The production of rubber hose in South Africa—principally by the South African Rubber Manufacturing Co., of Natal—is increasing.

51. Exports of rubber hose from the United States increased from 3,380 tons valued at £561,834 in 1928, to 4,189 tons valued at £643,977 in 1929.

United
States
exports of
rubber hose
in 1929.

52. Thus both in belting and hose, the only two sections of "mechanicals" for which comparable trade statistics are available, the United States is the chief exporting country, followed by the United Kingdom in regard to belting, and Germany in regard to hose. In both cases the Empire markets overseas are most important to the United Kingdom and to Canada. The trades generally are expanding and in all cases, except Canada, the exports from manufacturing countries go to a large number of

Important
markets.

countries. In both cases, the United Kingdom, besides being a large exporter, is also a large importer.

X.—THE RUBBER FOOTWEAR INDUSTRY.

Position
of the
industry.

53. The rubber boot and shoe trade makes the third greatest demand on supplies of raw material in the rubber industry. A wide range of footwear is included under this heading, from heavy rubber wading boots and wellingtons to the light canvas shoe with rubber sole, used for lawn-tennis and other sports and in tropical and sub-tropical countries. We have not included under this heading rubber soles and heels, in which there is an important trade.

Principal
manu-
facturing
countries.

54. Of the six principal rubber manufacturing countries, four lead in the production and export of rubber boots and shoes, namely, the United States, Canada, France and the United Kingdom. Japan and British Malaya export large numbers of the cheaper kinds and on account of price compete, in the Far East, with the four great producers. Germany, Sweden, Czecho-Slovakia and Latvia have a substantial export trade in rubber boots and shoes, which are also exported from several other European countries. Several of the South American countries also manufacture rubber shoes, but mainly for their own consumption.

Production.

55. Statistics of production of rubber footwear are available for the United Kingdom, Canada and the United States, but not for France. The following table shows the production in the most recent year for which details are available.

Year of Census.	United Kingdom.	Canada.	United States.
	1924.	1926.	1927.
Thousand dozen pairs ...	905	1,626	8,812

Exports of
rubber
footwear.

56. The following table shows the total value of the export of rubber boots and shoes from the chief exporting countries, in 1928, and their principal markets:—

*Export of Footwear—Rubber Boots and Shoes and Canvas Shoes
with rubber soles (not including rubber soles and heels).*

United Kingdom.	Canada.	United States.*	Germany†.
Total ... £456,255	Total £1,786,829	Total £1,895,300	Total ... £88,586

Chief markets in descending order. Figures in brackets are £000.

Denmark ... (39)	United Kingdom (714)	United Kingdom (455)	United Kingdom (22)
South Africa (37)	Argentina ... (262)	Philippines (194)	Denmark ... (20)
Irish Free State (37)	New Zealand (160)	Germany ... (141)	Italy ... (5)
India... ... (35)	India ... (91)	Cuba ... (121)	Latvia ... (4)
Egypt ... (25)	British West Indies (89)	Denmark ... (100)	Brazil ... (4)
New Zealand (22)	Denmark ... (78)	Canada ... (83)	Switzerland (3)
Netherlands (19)	South Africa (46)	India ... (68)	Belgium ... (3)
Italy ... (17)	Newfoundland (45)	Argentina ... (67)	Norway ... (3)
Norway ... (13)	Australia ... (32)	Norway ... (54)	Czecho-Slovakia (3)
Sweden ... (13)	Germany ... (29)	Switzerland ... (49)	Lithuania ... (2)
Australia ... (13)	Chile ... (26)	Mexico ... (40)	Sweden ... (2)
France ... (12)	France ... (21)	Sweden ... (40)	Argentina ... (2)
Argentina ... (12)	Uruguay ... (20)	Newfoundland (39)	Netherlands (2)
Austria ... (9)	British Guiana (20)	Colombia ... (37)	Austria ... (2)
Belgium ... (8)	Colombia ... (18)	Italy ... (26)	Norway ... (2)
Germany ... (7)	Mexico ... (12)	Australia ... (33)	Chile ... (1)
Turkey ... (7)	Dutch East Indies (10)	China ... (26)	Uruguay ... (1)
Hungary ... (6)	Dutch West Indies (9)	Austria ... (25)	Irish Free State (1)
United States (2)	Italy ... (9)	Chile ... (25)	
Straits Settlements (2)		Dutch West Indies (21)	
		South Africa (17)	
		Iceland ... (16)	
		Uruguay ... (15)	
		New Zealand (14)	
		Spain ... (13)	
		France ... (13)	
		Panama ... (13)	
		Belgium ... (13)	
		Finland ... (12)	
		British West Indies (10)	
		Nicaragua ... (9)	
		British Malaya (9)	

* Complete list of all markets worth more than £9,000 in 1927. The United States finds considerable markets in practically every country in the world.

† Goloshes only (Gummischuhe).

(a) The outstanding feature of this table is the large market for imported rubber footwear afforded by the United Kingdom, which is the chief export market for these products from the

United States, Canada and Germany—the three largest export countries. Other important markets were Argentina, Denmark, New Zealand, India, the Philippines, Germany, Cuba and South Africa.

(b) 50 per cent. of the exports from the United Kingdom are directed towards parts of the British Empire.

(c) The United States exports are very widely distributed.

(d) The German trade is almost wholly with Europe. Exports of rubber footwear, in 1928, from France were valued at £431,707. 79 per cent. of the total exports from these five chief export countries were the products of Canadian and United States manufacture.

United Kingdom market for rubber footwear.

57. Although the United Kingdom is thus one of the principal exporters of rubber boots and shoes it is by far also the large single import market. Since 1925 imports have exceeded exports thus :—

Year.	Exports.		Imports (retained).	
	£000	Doz. pairs.	£000	Doz. pairs
1923	363	223,376	258	142,766
1924	412	259,406	517	225,446
1925	450	281,708	818	321,660
1926	395	228,788	1,142	457,128
1927	407	248,384	872	415,728
1928	456	270,814	1,599	756,633
1929	559	343,786	1,623	1,027,291

The chief sources from which rubber boots and shoes were imported into the United Kingdom were, in 1928 :—

Country.	Thousand doz. pairs.
Canada	234
Belgium	156
United States	129
France	101
Germany	85
Sweden	33
Poland (including Danzig)	22

Only very small quantities of rubber footwear are imported into Canada, the United States and France.

58. The export trade in rubber footwear of the four principal manufacturing countries, during 1928, was as follows:—

Export
trade
in 1928.

Quantity (thousand pairs).				Value £000.			
Kingdom. United	Canada.	United States.	France.	United Kingdom.	Canada.	United States.	France.
3,250	9,423	9,102	4,379*	456	1,770	1,903	432

* Estimated from weight, at $1\frac{1}{4}$ pairs per kg.

59. In the Canadian and United States export returns canvas shoes with rubber soles are separated from other kinds of rubber footwear. It is, therefore, possible to compare more fully the export trade of those two countries in rubber footwear.

Comparison
of Canadian
and United
States
exports.

The average export value per pair of canvas shoes with rubber soles was approximately the same in both countries for 1928—2s. 10d. a pair. Canada exported in that year 7,376 thousand pairs valued at £1,048,000. The United States exported in the same year 5,313 thousand pairs valued at £756,000. Of the remaining kinds of rubber footwear exported, Canada exported during 1928, 2,047 thousand pairs valued at £722,000, or approximately 7s. a pair, while the United States exported 3,789 thousand pairs, valued at £1,147,000, or about 6s. a pair.

In the returns of the United Kingdom and France, all kinds of footwear involving the use of rubber are included under one heading only.

XI.—RUBBER SOLES AND HEELS.

60. A feature common to all branches of the rubber industry with which we have so far dealt in detail, lies in the fact that the centres of the industry in each are located in comparatively few countries. This condition does not hold for rubber soles and heels. In nearly every country in which there is any rubber manufacturing industry at all, soles and heels are made. Manufacturers exporting to these countries therefore have to face considerable competition from the local manufacturers. Very little skill is required in the manufacture of rubber soles and heels, the only difficulty being the preparation of the correct rubber mixture. A

Character-
istics of the
industry.

considerable proportion of reclaimed rubber is used in their manufacture. The machinery is comparatively inexpensive, a factor needing about £10,000 capital. There is a considerable demand for rubber soles and heels throughout the world, but it is impossible to obtain any reliable estimate of the amount of crude rubber absorbed in this industry. In the United States, in which the manufacture is on a very large scale 5,591 tons of crude rubber were absorbed in 1928* in the manufacture of soles and heels, being 1.4 per cent. of the total absorption of crude rubber, and 9.6 per cent. of the amount of crude rubber absorbed in the manufacture of rubber goods other than tyres and tubes. Since 1927, the manufacture of rubber composition soles and heels has greatly increased. These are mainly produced in Canada, see paragraph 78, and the United States, but chiefly for export. The recent increase in the exports of these articles from these two countries is very noticeable. In the export returns of the United States they are included with rubber soles and heels, but in the Canadian returns rubber soles and heels are not specified. A similar kind of composition sole and heel is also being made in the United Kingdom.

Inter-
national
trade.

61. The United States and Canada are the largest exporters of rubber soles and heels, and there are considerable exports from the United Kingdom, France and Germany. Other countries also export smaller quantities of soles and heels chiefly to their neighbouring countries—Czecho-Slovakia, Belgium, Russia and Austria are the chief exporters in this group. In the export trade returns however, only the United States and the United Kingdom specify the exports of rubber soles and heels. In the returns of most of the other producing countries they are included with other articles and are indistinguishable.

Exports of
the United
Kingdom
and the
United
States.

62. The table on the following page shows the exports of rubber soles and heels from the United States and from the United Kingdom, in 1928, as well as the principal markets for them arranged in descending order of importance. The total values of these exports in 1927 were:—

	£
United Kingdom	76,040
United States	392,137

The United States exports in 1928 were 27 per cent. greater than in 1927.

* See paragraph 20.

Exports of Rubber Soles and Heels in 1928.

Chief markets in descending order of value. Figures in brackets are £000.

United Kingdom.		United States.	
Total Value ...	£76,040	Total Value ...	£392,137
Total Weight ...	149 tons	Total Number	1,469,635 dozen pairs.
Irish Free State ...	(16)	United Kingdom ...	(66)
Netherlands ...	(13)	France ...	(39)
Australia ...	(10)	Germany... ..	(29)
New Zealand ...	(6)	Colombia... ..	(28)
South Africa ...	(4)	Canada	(27)
France	(4)	Sweden	(22)
Spain	(3)	Philippines	(21)
Switzerland	(2)	Argentina	(19)
Canada	(1)	Cuba	(18)
India	(1)	Norway	(13)
Belgium	(1)	Belgium	(12)
Denmark	(1)	Finland	(8)
Other Countries—		South Africa	(8)
Empire	(4)	Denmark... ..	(7)
Foreign... ..	(10)	Chile	(7)
		Uruguay... ..	(6)
		Netherlands	(5)
		Salvador	(5)
		Costa Rica	(4)
		Nicaragua	(4)
		Guatemala	(3)
		Switzerland	(3)
		Honduras	(3)
		Newfoundland	(3)
		Brazil	(2)
		Panama	(2)
		Haiti	(2)
		Australia... ..	(2)
		And 45 other markets worth less than £1,000 in 1928.	

The foregoing table shows that:—

(a) The United States finds very large markets in the North and South American Continents.

(b) The United Kingdom finds its markets in Empire countries and in Europe.

(c) The United Kingdom is by far the largest market of the United States.

(d) Other manufacturing countries, France, Germany, Canada, and Belgium obtain considerable quantities from the United States.

(e) South Africa imports from the United Kingdom were valued at £4,000 and from the United States at £8,000.

XII.—OTHER RUBBER MANUFACTURES.

Statistics
not com-
parable.

63. When considering tyres, mechanical rubber goods and footwear, we have dealt with fairly well defined classes of goods, the international trade in which is generally of such importance that they are separately returned in the import and export statistics of the chief manufacturing countries. The remaining classes of rubber manufactured goods are by no means so clearly defined. The headings in the trade returns describe them differently and many of the classes are included under composite headings from which it is impossible to ascertain at all accurately which classes are included. Rubber manufactures which may broadly be described as sports goods are shown in the returns of the United Kingdom and the United States, but not in those of the other countries. The wide range of surgical rubber manufactures are detailed in the returns of the United States only. Rubber waterproofed fabric is specified in the returns of the United States and partly in the returns of the United Kingdom. Comparisons similar to those in Sections V, VI, VII and VIII are therefore impracticable.

64. We give such details as are available in the trade returns of the four countries—the United Kingdom, Canada, the United States and Germany—which make a partial classification of these miscellaneous rubber goods.

Total Value of Exports in 1928.

	From the United Kingdom.	£	From Canada.	£
Exports from four manu- facturing countries.	Rubber in Sheets and Threads, etc.	503,249		
	Elastic cords, webs, braids and fabrics.	332,217		
	Rubberproof cloth of which the chief value is rubber and sheeting of rubber.	595,102		
	Rubber Balls :—			
	Golf	332,737		
	Tennis	201,790		
	Others	44,131		
	Toys wholly or mainly of Rubber.	8,245		
	Mats, matting and tiling of Rubber.	40,585		
	Rubber Gloves	4,881		
	Fountain pens (including gold nibs).	105,069		
	Waterproof outer garments— Rubber proofed.	785,504	Clothing (rubber) including waterproofed.	6,000
	Other miscellaneous rubber manufactures.	564,029	Other miscellaneous rubber manufactures.	280,000
		3,386,719		286,000

From the United States.	£	From Germany.	£
Rubber thread	362,800	Rubber thread	178,000
Elastic webbing	266,200	Fabric with rubber thread; rubber goods with textiles.	1,075,000
Rubberized piece goods and hospital sheeting.	178,000	Rubber solution	26,750
Rubber toys and balls ...	41,800	Soft rubber paste and rolled sheets thereof; cuttings of rubber; rubber sheets with wire rolled in; all not vul- canized; reclaimed rubber; gutta-percha paper.	124,000
Rubber balloons	154,500	Cut sheets of rubber, not vul- canized, unmanufactured.	20,000
Rubber gloves	56,150	Wares of soft rubber n.e.i., floor coverings; rubber sheets combined with fabric; iron rollers coated with rubber.	1,838,000
Rubber water bottles and fountain syringes.	46,500	Rubber print cloths for fac- tories and card cloth for carding factories.	29,000
Other Druggists' rubber sundries.	88,500	Wagon covers of coarse fabric coated with rubber.	1,080
Fountain pens	380,000	Hard rubber :—	
Rubber bands and erasers ...	124,000	Paste, not vulcanised and for dental purposes.	5,650
Bathing caps	77,100	In sheets, bars, rough pressed goods unworked.	46,800
Electrical hard rubber goods	67,500	Tubes of hardened rubber, not further worked.	6,025
Other hard rubber goods ...	72,600	Other goods of hardened rubber.	474,000
Rubber and friction tape ...	99,250	Other miscellaneous rubber manufactures.	340
Waterproof outer garments ...	160,000		
Waterproof auto-cloth ...	266,000		
Other miscellaneous rubber manufactures.	538,000		
	2,978,900		3,824,645

XIII.—THE EXPORT TRADE OF FRANCE IN RUBBER MANUFACTURED GOODS.

65. The figures of French exports have been omitted from the foregoing comparative tables on account of material differences in the classification of the French trade statistics. Therefore, the export trade, which is large, must be treated separately. As may be seen from the table attached to Appendix III the headings in the French official export returns relating to rubber manufactures do not correspond with those of the other principal exporting countries, and details of the exports to different countries are only given for tyres and for the total of rubber manufactures. Even in the case of tyres, one heading includes all kinds of outer covers, inner tubes and solid tyres, and the exports to each country are given by weight only and not by number or value. The United States Department of Commerce, in discussing these French returns, assume that the outer covers for motor cars included in the return

French statistics not comparable with other

bear a constant proportion to the weight of all the kinds of tyres exported. On this method (see para. 33) they arrive at the probable number of outer covers exported, by dividing the total weight of exports in kilogrammes by 13. They consider this proportion to give reasonably close results when applied to the total French tyre exports, but to require modification in considering exports to particular countries. However reasonable a comparison this may give, similar estimates in regard to other classes of rubber manufactures are even more unsatisfactory.

The
Michelin
Company.

66. France enters into international competition in rubber manufactures chiefly through the operations of one great firm—the Michelin Company. This Company publishes no statistics. Like the other six large rubber manufacturing companies, it is international in character. It has a factory in Italy where it holds a strong position in the motor tyre industry of the country. It also has factories in England and the United States.

Exports
of France.

67. The following table based on official statistics gives the export trade of France in rubber Manufactured Goods for 1926, 1927 and 1928 :—

Exports from France of Manufactures of Rubber or Gutta-Percha.

Commodity.	1926.	1927.	1928.	1926.	1927.	1928.
	tons.	tons.	tons.	£'000.	£'000.	£'000.
Sheets of pure rubber not vulcanised and vulcanised rubber threads.	145	184	343	50·9	29·1	36·6
Elastic Tissues	178	140	189	190·9	61·5	93·7
Tissues in pieces... ..	506	424	670	482·0	111·0	159·5
Made up articles of rubber tissues.	21	21	32	21·9	10·0	19·6
Clothing and accessories of made-up clothing.	289	263	256	297·5	118·0	127·2
Hygienic rubbers			30			15·0
Tissues for cards, not fitted.	137	168	190	50·0	54·2	62·6
Footwear... ..	3,623	3,312	3,503	677·5	420·5	431·7
Belting, tubes, valves, etc.	2,446	2,544	3,083	444·0	388·0	431·6
Total ... ..	...	...	...	2,214·7	1,192·3	1,377·5
Outer Covers, Inner Tubes solid tyres :—						
United Kingdom	6,864	4,425	1,346	(Values not given in trade returns.)		
Belgo-Luxemburg E.U....	1,464	1,496	1,792			
Switzerland	2,575	3,528	2,428			
Spain	1,454	2,078	1,990			
Morocco	740	707	770			
India	919	1,424	851			
Australia	369	922	906			
Italy	979	1,477	986			
Other Countries	9,474	11,067	11,425			
Total	24,929	27,134	22,494	6,775·0	6,520·0	4,812·0

NOTE.—The figures for 1928 are provisional.

68. The total value of the exports of all rubber manufactures from France thus compares with the exports from the United Kingdom, Canada, the United States and Germany as follows :—

Comparison with other exporting countries.

Exports of Rubber Manufactures from	Value in £000.		
	1926	1927	1928
France	8,992	7,712	6,190
United Kingdom	8,679	7,762	7,981
Canada	5,440	5,874	6,262
United States	11,996	13,967	14,159
Germany	4,731	4,965	5,654

69. From the details given in para. 67 of the exports of tyres and tubes from France, it will be seen that in 1928 eight countries took nearly 50 per cent. of the tyres and tubes exported from France. These countries were, in order of importance, as follows :—

Markets for French tyres.

Country.	Percentage of tyres exported.	Country.	Percentage of tyres exported.
Switzerland	10·8	Italy	4·4
Spain	8·9	Australia	4·0
Belgo-Luxemburg E.U.	8·0	India	3·8
United Kingdom ...	6·0	Morocco	3·4

In 1926 and 1927 the United Kingdom was by far the most important export market for French tyres and tubes, taking, in 1927, over 16 per cent. and, in 1926, over 27 per cent. of the total quantity of exports of tyres and tubes. The Michelin Company, however, have founded a factory in England. The first contracts were placed in June, 1926 and the factory was completed in October, 1927. The first tyres were manufactured in this factory on the 15th November, 1927.

70. The following table gives the weight and value of all manufactures of rubber and gutta-percha, other than tyres, exported from France to her principal markets in 1926, 1927 and 1928. The table is arranged in descending order of quantity exported in 1927.

Markets for other French manufactures of rubber.

*Exports from France of Manufactures of rubber and gutta-percha,
other than tyres.*

Destination.	1926.	1927.	1928 (a).	
	Tons.	Tons.	Tons.	
United Kingdom	1,481	1,487	1,690	
Algeria	270	1,019	(b)	
Belgo-Luxemburg	942	872	1,340	
Switzerland	403	423	971	
Netherlands	186	315	} (b)	
Syria	260	308		
Czecho-Slovakia	40	219		
Austria	(b)	187		
Germany	85	164		
Egypt	319	155		
Turkey	182	155		
Indo-China	131	140		
Spain	127	134		172
Italy	296	120		221

(a) Provisional figures.

(b) Not available.

Exports of rubber manufactures other than tyres of less than 100 tons weight have been omitted.

Countries to which less than 100 tons of these "goods" were exported have been omitted. Yet the fourteen countries for which details have been given took 5,700 tons out of the 6,003 tons exported from France in 1927. In contrast with this total the exports of rubber belting alone from the United Kingdom in 1927 exceeded 11,000 tons (c.f. paragraph 43). The French export trade in rubber goods is predominantly a trade in tyres (c.f. paragraph 67). The markets for other rubber goods are mostly in the countries of Europe and the Mediterranean basin. The United Kingdom is the chief. In 1927 the exports to that market consisted of rubber footwear (822 tons), belting and mechanicals (486 tons), waterproofed clothing (84 tons), of elastic and elastic tissues (60 tons).

XIV.—SUMMARY OF THE FOREGOING ANALYSIS OF EXPORT TRADES.

71. This closes our analysis of the export trades of the chief countries competing in the international trade in rubber goods. Although the manufacture of tyres overshadows all other branches of the rubber industry, yet the foregoing analysis brings out the movement of the large tyre firms to establish their own factories in different countries and also the manner in which the international trade in other forms of rubber goods is developing. Rubber

belting is supplanting other forms of belting, the miscellaneous list of rubber articles exported is increasing and the trade in several articles on this list is growing. Although 75 per cent. of the rubber absorbed in industry is used in the manufacture of tyres, exports of tyres in 1928 from seven of the leading manufacturing countries formed by value only 56 per cent. of the total exports of rubber manufactures from those countries. The percentage varied greatly from country to country, being very high for Italy, Belgium and France and very low for Germany. In the United Kingdom and the United States exports, tyres form somewhat less and somewhat more respectively than half the total exports of rubber goods. The percentages are as follows :—

	<i>Per cent.</i>		<i>Per cent.</i>
United Kingdom ...	45	France	78
Canada	65	Italy	88
United States ..	53	Belgium	87
Germany	21		

72. We show in summary form the countries from which the chief importing countries of the Empire obtained, in 1928, the rubber goods they imported. Imports of
Empire
countries.

Commodity.	Imported into	Imported from						Total Import
		United Kingdom	Canada	United States.	France.	Italy.	Germany.	
Tyres ...	United Kingdom.	£000. —	£000. 230·8	£000. 187·5	£000. 195·8	£000. 81·8	£'000 39·6	£000 972·0
	Canada ...	1·3	—	65·1	1·4	—	—	67·8
	Australia* ...	224·4	150·6	450·1	133·6	113·6	0·9	1,082·0
	South Africa...†	356·4	324·6	268·2	32·9	37·4	2·1	1,057·6
	New Zealand	234·3	596·8	78·1	114·3	4·2	3·2	1,045·9
	India† ...	602·9	289·6	404·0	236·1	79·6	60·0	2,703·6
Other rubber manufactures	United Kingdom.	—	889·4	1278·8	314·9	17·2	625·1	3,531·5
	Canada ...	121·9	—	599·2	3·7	—	22·0	753·8
	Australia* ...	323·8	41·3	303·2	4·3	0·8	53·6	767·7
	South Africa...†	138·2	11·8	75·8	2·1	0·1	5·6	235·6
	New Zealand	81·1	209·5	48·2	0·3	—	3·8	374·7
	India† ...			(details not available).				

* Fiscal year ended 30th June, 1929.

† Fiscal year ended 31st March, 1929.

Greater details are given in Appendix IV, Table D, pp. 107-113.

B.—THE INDUSTRY IN DIFFERENT COUNTRIES.

XV. THE INDUSTRY IN THE UNITED KINGDOM.

Balance of
trade in
rubber
manufac-
tures.

73. We now give short descriptions of the rubber manufacturing industry in each of the principal manufacturing countries, taking first the Empire countries and then foreign countries. We begin with the United Kingdom. In our analysis of international trade given in the earlier section of this Survey, the United Kingdom has repeatedly occupied a prominent position as a destination of the exports of other countries. But on balance the United Kingdom is an exporter of rubber goods. This is clear from the following table. Imports into the United Kingdom, however, in 1928, exceeded exports in seven classes of rubber goods, in boots and shoes, soles and heels, balls (other than golf or tennis balls), rubber gloves, overalls and aprons wholly of rubber, vulcanite and ebonite rods, tubes, sheets, etc., and toys, wholly or mainly of rubber. In all other varieties of rubber goods, exports exceeded imports. The position in 1928 was as follows:—

Articles.	Exports.	Imports.	Re-exports	Net Imports.	Balance.*
	£000.	£000	£	£000	£000
<i>Tyres:—</i>					
Outer Covers for—					
Motor Cars	2,198·5	558·8	135,722	423·1	1,775·4 *
Motor Cycles	94·1	57·8	1,103	56·7	37·4 *
Cycles	405·6	120·7	13,437	107·3	298·3 *
Inner Tubes for—					
Motor Cars	352·2	72·5	25,437	47·1	305·1 *
Motor Cycles	22·9	6·7	189	6·5	16·4 *
Cycles	125·6	64·8	4,578	60·2	65·4 *
Solid Tyres for—					
Motor Cars and Cycles ...	220·4	88·9	4,898	84·0	136·4 *
Other vehicles	5·7	2·4	113	2·3	3·4 *
<i>Mechanicals:—</i>					
Belting	221·0	79·0	3,243	75·8	145·2 *
Piping and Tubing	249·2	114·1	3,759	110·3	138·9 *
<i>Footwear:—</i>					
Boots and Shoes	456·3	1,622·5	26,900	1,595·6	1,139·3 †
Soles and Heels	76·0	266·5	4,475	262·0	186·0 †
<i>Miscellaneous:—</i>					
Rubber Balls for Golf ...	332·7	0·6	6	0·6	332·1 *
" " Tennis	201·8	7·3	15	7·3	194·5 *
" " Other	44·1	91·1	3,216	87·9	43·8 †
Rubber Gloves	4·9	25·4	935	24·5	19·6 †
Rubber mats, matting and tiling.	40·6	13·3	943	12·4	28·2 *
Rubberproof Cloth and Sheet- ing.	595·1	45·3	1,023	44·3	550·8 *

* means exports exceed net imports.

† means net imports exceed exports.

Article.	Exports.	Imports.	Re-exports.	Net Imports.	Balance.*
Apparel—rubber water-proofed.	785·5	107·0	9,137	97·9	687·6 *
Overalls and Aprons wholly of rubber.	2·4	93·3	7,798	85·5	83·1 †
Vulcanite and Ebonite in rods, tubes, sheets, etc.	34·1	47·3	562	46·7	12·6 †
Fountain pens (including gold nibs).	105·1	9·2	12,896	‡	105·1 *
Elastic cords, webs, braids, and fabrics.	332·2	263·8	10,427	253·4	78·8 *
Sheets, threads, etc., wholly of rubber.	503·2	197·3	58,648	138·7	364·5 *
Toys, wholly or mainly rubber	8·2	104·7	4,551	100·1	91·9 †
Rubber manufactures, n.e.s.	564·0	453·3	29,462	423·8	140·2 *
Total	7,981·4	4,513·6	—	4,154·0	3,827·4 *

* means exports exceed net imports.

† means net imports exceed exports.

‡ re-exports exceeded imports.

Thus in 1928, exports of rubber goods exceeded imports by £3,827,400.¹

74. As we have already shown in paragraph 18, the United Kingdom industry absorbs more crude rubber than that of any country other than the United States. The absorption of rubber by manufacturers in the United Kingdom during recent years has been as follows :—

Year.	Absorption. Tons.
1923	29,002
1924	21,540
1925	30,100
1926	39,700
1927	44,800
1928	48,500
1929	72,000

¹ In the seven cases in which imports exceeded exports the chief supplying countries were as follow :—

Of the rubber boots and shoes £702,288 worth or 43 per cent. came from Canada, £512,980 worth or 31 per cent. from the United States and £116,773 worth or 7 per cent. from France. Other supplying countries were, in order, Germany, Belgium, Sweden and Poland. 63 per cent. of the soles and heels imported came from Canada, 34 per cent. from the United States. Of the rubber balls (other than golf or tennis) imported, 45 per cent. came from France and 23 per cent. from Germany. Others came from Sweden, Austria, United States and Belgium. Of the rubber gloves imported 67 per cent. came from the United States and 31 per cent. from Germany. Most of the rubber overalls and aprons (98 per cent.) came from Germany. 44 per cent. of the Vulcanite and Ebonite came from Sweden, 27 per cent. from the United States and smaller quantities from Germany and France. Of the toys imported, 54 per cent. came from the United States, 24 per cent. from Germany, 13 per cent. from France and small amounts from Sweden, Hungary, Japan, and Austria.

Production. 75. Details of the production of rubber manufactures in the United Kingdom for the last year in which a Census of Production was taken, 1924, are given in Appendix III. Firms that made their Returns on Schedules for the Rubber Trade in 1924 employed 39,350 operative staff and 7,215 managerial, scientific and clerical staffs. Their output was valued at £23,309,000, namely Tyres £10,382,000; Rubber Sheet and Thread £907,000 (part of which may have been duplicated in the value of other goods); Other Rubber Goods £9,715,000; Waterproofing, etc., done for the trade (chiefly for merchants) £514,000; Goods not of rubber £1,791,000. In addition waterproof garments to the value of £1,606,000 were returned by firms engaged in the Clothing Trades, and games, toys, etc., to the value of £800,000 by firms engaged in the Games and Toys Trades. The aggregate value of rubber goods of all kinds (except insulated cables and wires and some surgical and scientific instruments) made in 1924 was thus between 23 and 24 millions sterling. The value of production in the rubber industry returned in the United Kingdom Census of 1907 was £8,908,000. The rubber industry of the United Kingdom thus increased between 1907 and 1924 by some 160 per cent. As in 1924 the price of raw rubber was only some 25 per cent. of what it had been in 1907, the volume of output had probably increased tenfold. Although no details of production for years subsequent to 1924 are available, the figures of absorption of raw rubber indicate that in 1928, the output of rubber factories in the United Kingdom was more than double that in 1924. Further expansion occurred during 1929, due largely to the great development in the tyre industry in this country. The India Rubber Manufacturers' Association estimate that, in 1928, some 60,000 workpeople were employed in 120 factories in the United Kingdom. Forty of these 120 factories probably account for 90 per cent. of the output.

Oversea
firms manu-
facturing
in the
United
Kingdom.

76. The most notable feature of the rubber tyre industry of the United Kingdom is that, since 1927, several of the more important foreign tyre manufacturers have set up factories in the United Kingdom. Those that have already done so are:—

Goodrich Tyre Co.; Firestone Tyre & Rubber Co. (1922), Ltd., at Brentford; Goodyear Tyre & Rubber Co. (Great Britain), Ltd., at Wolverhampton; Indian Tyre & Rubber Co. (Great Britain), Ltd., at Inchinnan; Industrial Rubber Manufacturers, Ltd., licensed to make and sell Miller tyres; Michelin & Co., at Stoke-on-Trent; Pirelli, Ltd., at Burton-on-Trent.

These companies are in a position to use their branches in the United Kingdom to supply Empire markets and those which are

affiliated with American firms may use them to supply certain European markets.

XVI.—THE INDUSTRY IN CANADA.

77. The rubber manufacturing industry in Canada takes the fifth place in the world. As we have shown in paragraph 18, Canada absorbed, in 1929, 35,500 tons of crude rubber, or 4.41 per cent. of the world supply. The Canadian industry has grown rapidly both for the home market and for export due largely to the increase of motor transport and the necessity for rubber footwear. In Canada more than one million motor vehicles are in use, and rubber footwear is used to a very great extent, particularly in the winter months. In 1928, 45 establishments were engaged in the industry. The capital invested in the industry was £14,500,000 of which the section engaged primarily in the manufacture of tyres accounted for £11,000,000 and the section chiefly making footwear for £3,000,000. Employees numbered 17,095 and salaries and wages amounted to £3,900,000.

Position
of the
industry.

78. The gross value of production in the Canadian rubber industry in 1928 was £20,020,000, including £10,200,000 for tyres, £6,670,000 for footwear and £3,150,000 for other rubber manufactures. In each section these figures were an increase on the value of production in 1927. Certain details of the quantities of rubber goods manufactured in Canada in 1928 are also available. In the tyre section 4,338,578 outer covers and 4,638,429 inner tubes, in addition to 17,377 solid tyres for motor vehicles were manufactured. 186,623 outer covers and 207,747 inner tubes for bicycles and 36,467 outer covers and 22,394 inner tubes for motor-cycles were also produced. Manufactures of footwear totalled 23,941,164 pairs. Manufactures of rubber goods other than tyres or footwear included rubber clothing—64,952 coats and 16,333 pieces of headwear as well as other miscellaneous rubber clothing valued at £118,000. Rubber and composition soles produced reached 3,534,885 pairs; half-soles, 499,163 pairs and heels 20,600,402 pairs. 2,660 tons of belting, valued at £624,000 and 2,280 tons of rubber hose worth £430,000 were also manufactured. Other products involving the manufacture of rubber made in Canada included, tyre repair materials, rubber mats and matting, tiling and flooring, sheet packing, battery jars, hospital sheeting, wringer rollers and fruit jar rings. Details of production compared with imports and exports are given in Appendix III, page 93.

Productio
in 1928.

79. Canada is on balance an exporting country as regards rubber goods. Only in rubber clothing and miscellaneous rubber articles do imports exceed exports and are high relatively to the local pro-

Imports a
exports.

duction of those articles. Total exports exceeded imports, in 1926, 1927 and 1928, as follows :—

All rubber manufactured goods.	1926.	1927.	1928.
	£000	£000	£000
Exports	5,440	5,874	6,262
Imports	660	689	753
Re-exports*	26	14	17

* These include the value of re-exports of raw rubber as well as rubber manufactures.

Rubber
companies
in Canada.

80. The development of the manufacturing industry in Canada is of special interest. Several of the principal companies in Canada were founded by United States companies and some are still controlled by their parent organisations, which, in several cases, have allocated to their Canadian branches the care of certain export markets. In Appendix V we give certain particulars of 15 of the larger Canadian companies, some of which have been Canadian from inception, whilst others though started by American interests have subsequently passed under Canadian control. The information in Appendix V shows that although the companies may concentrate on certain markets they do not concentrate rigidly on special lines of goods. Tyres and shoes or tyres and soles and heels are not uncommonly produced by the same company. The largest rubber manufacturing companies in Canada are the Good-year Tyre & Rubber Co., of Canada and the Dominion Rubber Co. The production of the former company is some 6,000 tyres a day. Both companies, in addition to tyres, manufacture footwear and mechanical goods. The Dunlop Tyre & Rubber Goods Co., of Toronto is associated with the Dunlop organisation of Great Britain and is engaged largely on tyres. The Gutta Percha & Rubber Co., Ltd., a purely Canadian concern, has a wide range of products covering most kinds of footwear, mechanical goods and tyres. With some firms the manufacture of goods other than tyres is the more important activity. As will have been clear from our analysis of the international trade in rubber goods, the Canadian industry has in the course of very few years achieved an important position among the countries of the world in which rubber goods are manufactured.

XVII.—THE INDUSTRY IN AUSTRALIA.

Manufacturing
companies.

81. In Australia there are some 60 factories in which rubber products are manufactured and which employ approximately 4,000 workpeople. The three principal Australian rubber manufacturing companies are :—

Dunlop-Perdriau Co.; North Australian Rubber Mills;
Hardies' Rubber Co.

The Dunlop-Perdriau Company is the result of a merger during 1929 of the Dunlop Company of Australia, the Perdriau Company, which was an Australian rubber manufacturing concern dating back to 1881, and the Barnet Glass Rubber Company. The merger involved paid capital of £4,694,151. In addition to all kinds of tyres, this firm manufactures mechanicals, waterproof clothing, rubber shoes and general rubber goods. It has branches in all the capital cities of the States and is by far the largest rubber manufacturing organisation in the Commonwealth. The Goodyear Company of the United States also have a factory in Australia.

82. About half the rubber manufactured goods consumed in the Commonwealth are made locally and the proportion of local manufacture is increasing. Tyres and tubes naturally form the largest class of imports. In 1928 severe falls occurred in practically all classes of imported rubber goods as will be seen from the following table which shows the total value of imports of each class of articles and the percentage which came from Empire countries. Imports.

Imports of rubber manufactured goods into Australia.

	1925-26.		1926-27.		1927-28.	
	Value.	Per cent. from Empire	Value.	Per cent. from Empire	Value.	Per cent. from Empire
	£000.		£000.		£000.	
Tyres (Pneumatic) ...	2,047	38	1,558	44	801	32
Tyres—rubber, other ...	313	35	319	36	193	40
Tyre fabric—rubbered ...	1	77	3	87	—	—
Tubes	321	47	224	56	88	50
Belting	18	42	15	39	15	33
Goloshes, rubber boots and shoes.	85	82	114	82	56	78
Elastic thread — boot and apparel.	252	58	259	48	314	55
Dental cements and trays	18	79	14	70	18	72
Syringes and surgical goods	13	75	22	70	23	68
Floor coverings and mats	13	38	22	55	10	30
Hard rubber in sheets ...	7	66	21	75	15	27
Rubber articles (n.e.i.) ...	268	42	327	39	317	42
Total	3,361	42	3,898	34	1,850	40

83. During the same period the imports of crude rubber and of rubber machinery have been increasing. In the three years 1925-26 to 1927-28 the imports of crude and reclaimed rubber

were respectively 3,400 tons, 10,300 tons and 10,000 tons and rubber machinery was imported to the value of £26,500; £65,500 and £120,600 respectively. The proportions of this machinery which were imported from Empire sources were respectively 78 per cent., 30 per cent. and 52 per cent. No details are forthcoming under different classes of goods but the total value of rubber goods manufactured locally in 1926-27 was reported to be £6,220,000. More recent figures should show increases, as 16,000 tons of crude rubber were absorbed in 1929.

Exports.

84. Exports of rubber manufactured goods from Australia are small and fluctuate considerably from year to year. In the three years 1925-26 to 1927-28 they totalled respectively £106,000, £54,000 and £68,000. Miscellaneous rubber goods comprise the greater portion of these. Thus:—

Value of Exports of Rubber Goods of Australian Manufacture.

	1925-26.	1926-27.	1927-28.
	£000	£000	£000
Hose	12	8	6
Tyres including tubes	24	7	12
Boots, shoes, etc.	—	1	1
Other rubber goods	70	38	49
Total	106	54	68

New Zealand and portions of the British Empire in the Southern Seas are the chief destination of these exports.

XVIII.—THE INDUSTRY IN OTHER PARTS OF THE BRITISH EMPIRE.

85. In several other parts of the British Empire factories exist for the manufacture of rubber goods. These mostly serve only part of the needs of the local market, and hardly participate at all in the export trade. Two of the largest of these factories are in South Africa and Singapore. In the Union the industry centres in the South African Rubber Manufacturing Company, Ltd., originally a subsidiary of the British firms of Spencer Moulton and Wood-Milne. Works were established in Natal in 1921, but later were moved to the outskirts of Johannesburg. "Mechanical" rubber, soles and heels are the chief products of the factory. In Singapore, in Mr. Tan Kah Kee's factory, rubber boots and shoes, bicycle tyres and various miscellaneous rubber

goods are manufactured, which not only command a local sale but are also exported to neighbouring countries.

XIX.—THE INDUSTRY IN THE UNITED STATES.

86. Imports of crude rubber into the United States in 1927 were 341,000 tons, or 3 per cent. more than in 1926. Owing to the continued use of reclaimed rubber, absorption of crude rubber by manufacturers in the United States increased but slightly, from 365,000 tons in 1926 to about 375,000 tons in 1927. In the last half of 1927 the demand for motor tyres was greatly reduced by the decline in motor vehicle production, but in 1928 absorption greatly increased again to 440,000 tons, and again, in 1929, to 470,000 tons. Tyres and tubes for motor vehicles form the greater portion of its manufactures. The percentage of the total absorption of rubber used for tyres rose from 70 per cent. in 1917 to 85.6 per cent. in 1928. In 1926 and 1927 the absorption of rubber in the United States was less than in 1925, due largely to the increased use of reclaimed rubber since 1925, and to the fact that the Ford Company was out of production during part of this period. The abnormal production in 1925 was due to the change over from high pressure to low pressure tyres. The increased imports of crude rubber in 1926 and 1927 were used chiefly to make up depleted stocks of raw material and to supply the growing re-export trade in rubber to Canada, Russia and other countries.*

87. The rubber manufacturing industry in the United States is larger than that of all other countries combined, absorbing some 60 per cent. of the estimated world production of rubber. This great industry is due to the development of the motor industry, which utilises more than 85 per cent. of the crude rubber imported.

* *Re-Exports of Crude Rubber from the United States.*

	1926.		1927.		1928.	
	Tons.	£000.	Tons.	£000.	Tons.	£000.
Total	17,671	4,625	27,775	5,080	32,160	3,730
Canada	17,365	4,550	25,177	4,680	} (no details available)	
U.S.S.R.	(not mentioned)		1,680	273		
Germany	39	7	478	74		
United Kingdom	139	27	232	35		
Other Countries	128	41	208	18		

The following table shows the growth of the industry in the United States between 1921 and 1927 :—

Year.	Establishments.	Wage Earners (average number).	Primary Horse Power.	Wages.	Cost of Materials.	Value of Product.
The industry as a whole :				£000.	£000.	£000.
1921	496	103,273	*	25,400	77,870	144,950
1923	529	137,868	605,634	37,460	103,050	196,900
1925	530	141,869	656,691	39,180	147,750	257,950
1927	516	141,997	790,622	40,700	135,700	252,000
Tyres and Inner Tubes :						
1921	178	55,496	*	15,420	60,000	102,000
1923	160	73,963	370,551	22,350	75,100	132,200
1925	126	81,640	403,227	24,800	115,000	190,000
1927	109	78,256	451,724	24,650	104,200	178,500
Boots and Shoes :						
1921	24	23,888	*	4,820	6,600	19,350
1923	25	29,435	56,184	6,930	9,300	27,100
1925	23	24,999	59,413	5,770	8,350	23,850
1927	22	26,848	68,359	6,600	8,900	25,600
Other rubber manufactures :						
1921	294	23,889	*	5,160	11,270	23,600
1923	344	34,470	178,899	8,180	18,650	37,600
1925	381	35,230	194,051	8,610	24,400	44,100
1927	385	36,893	270,539	9,420	24,190	47,500

* Not recorded in the 1921 census.

Production. 88. The value of rubber products in 1923 was thus 36 per cent. greater than in 1921; in 1925 it had increased by another 31 per cent. over 1923, chiefly as the result of the increase of £44,700,000 in the cost of materials. In the rubber tyre branch of the industry the value of the products in 1925 was £190,000,000, an increase of about 44 per cent. over the value in 1923. The decline in the number of establishments in the tyre branch, from 160 in 1923 to 109 in 1927, indicates the tendency towards centralisation of the tyre industry. There was also a decline in the number of establishments in the rubber boot and shoe branch, while for other rubber products the number showed an increase.

89. The total value of the output of the rubber industry in 1927 was slightly less than that for 1925, although greater than that for 1923. Reductions in tyre prices were responsible for this decline. The value of the output of boots and shoes, in 1927, was higher than that for 1925 although less than that for 1923. For other kinds of rubber manufactures the value in 1927 was higher than in previous census year.

90. The sharp drop in the production of motor vehicles at the end of 1927 was reflected in reduced tyre-production during the last four months of the year. Consignments of outer covers to car manufacturers, described as original equipment sales, have been as follows :—

Year.	Percentage of total consignments described as original equipment sales.			
	Per cent.			
1922	27.0
1923	37.0
1924	28.0
1925	30.6
1926	30.8
1927	23.6

Tyre manufacturers' stocks were smaller by 112,000 outer covers, 1,868,000 inner tubes, and 7,000 solid tyres at the end of 1927 than at the beginning of the year.

91. The fabric tyre is now obsolete in the United States, and the present trend indicates increasing concentration on the balloon type. Tyre manufacturers favour standardisation of tyre sizes in order to reduce the heavy moulding equipment required for differing sizes and types. Changes have occurred during the last seven years from fabric to cord tyres, from clincher to straight-side tyres, and from high-pressure to balloon tyres. These changes have resulted in greater durability of tyres and greater comfort to motorists, but have kept the tyre manufacturers constantly in the market for expensive moulding equipment. As old cars are superseded by new models the necessity for the continued production of obsolete tyre sizes will gradually disappear.

92. Absorption of crude rubber by manufacturers of belting, hose and packing amounted to 15,614 tons in 1927, which was 3 per cent. more than in 1926, but 17 per cent. less than the peak absorption of 1925. The figures indicate that an increasing amount of reclaimed rubber has been used in the manufacture of mechanical rubber goods.

The total value of rubber boots and shoes produced in 1927 was £21,375,000, which was smaller than in any recent year except 1922 and 1925. The total value of heels and soles produced amounted to £4,040,000 in 1927, compared with £3,780,000 in 1926; and the absorption of rubber in heels and soles declined from 4,276 tons in 1926 to 3,895 tons in 1927.

Although absorption of crude rubber for insulated wire and insulating compounds increased from 3,047 tons in 1926 to 3,481 tons in 1927, the total value of the products declined from £7,300,000 to £7,020,000.

Types of
tyres pro-
duced.

Output of
rubber
products
other than
tyres.
(a) Mechan-
ical rubber
goods.

(b) Boots
and shoes.

(c) Insulate
wire and
insulating
compounds

rubber goods. Absorption of crude rubber in hard-rubber goods in 1927 showed a decline of 72 per cent. from the amount in 1925, and the value of the products declined from £2,620,000 in 1925 to £1,660,000 in 1927. In all these classes of rubber manufactures, reclaimed rubber was used particularly to replace crude rubber during 1926 and 1927.

(e) Druggists' rubber goods. The output of druggists' sundries was greater in 1927 than in 1926. Absorption of crude rubber increased from 2,329 tons to 4,224 tons, and the value increased from £2,660,000 in 1926 to £2,900,000 in 1927.

(f) Proofed goods. The absorption of crude rubber for proofed goods increased 61 per cent. in 1927 over 1926, and the value of the products increased 21 per cent.

Price trend of rubber manufactures. 93. The general trend of wholesale tyre prices in the United States, which was downward from 1920 to 1924, turned sharply upward in 1925, during which year there were five general increases. In 1926 prices were reduced in February, July and November until the average wholesale price for four common sizes was lower than before the price increases of 1925. Tyre prices were further reduced by 5 per cent. on 1st November, 1927, bringing them to the lowest level in the history of the industry. The relatively low price of crude rubber was an important factor in keeping prices down from 1922 to 1924, but manufacturing and other economies were instituted during this period which enabled manufacturers to keep tyre prices stable for a considerable time, in spite of rising costs of crude rubber. The increases in prices of tyres in 1925 and the decreases in 1926 were largely a result of changes in the price of crude rubber, while the reduction in 1927 was caused primarily by intense competition.

94. Prices of rubber manufactures other than tyres also moved upward during 1925; fine rubber goods, such as druggists' sundries, toy balloons and gum-rubber specialities, reacted most rapidly to the advance in price of crude rubber. During 1926 and 1927 the prices of these products followed the decline in the price of crude rubber. Prices of mechanical rubber manufactures and rubber footwear were not so erratic as those for fine rubber goods, but decreased to generally lower levels at the end of 1927 than at the beginning.

Foreign trade. 95. The total value of exports of rubber manufactures from the United States increased almost steadily from about £1,000,000 in 1901 to about £3,000,000 in 1915. A much more rapid development occurred in the following years and the total value of exports increased from £7,220,000 in 1916 to £17,550,000 in 1920. The war, which brought foreign orders to the United States, was also responsible for very high prices of finished goods, and the quantities exported did not increase at the same rate as the inflated values.

The slump in 1921 reduced the total value of rubber goods exports to some £6,300,000 but since then it has more than doubled, being £14,392,000 in 1928 and £15,445,000 in 1929.

XX.—THE INDUSTRY IN FRANCE.

96. As we have shewn in Section XI France is one of the principal consumers of rubber in the world. The number of registered motor vehicles increased from 231,000 in 1920 to about 900,000 in 1927. The number of pedal cycles in France is nearly seven millions. Rubber manufacturers in France, in 1929, absorbed 61,800 tons or 7.67 per cent. of the world supply. During the War, French manufacturers greatly increased their equipment and power of production to meet the needs of national defence, and the rubber industry, notwithstanding the development of the export trade and of the home consumption, since the War, has probably not yet attained its full output capacity. It is impossible to measure the productive capacity of the industry, owing to the great variety of its products and the absence of any Census of Production. Between 50 and 60 thousand wage earners are employed in the industry. In 1926, exports of rubber manufactured goods, in weight, were 4.5 times those of 1913, while imports had hardly increased.

Position
of the
industry.

97. The principal firms engaged in the rubber manufacturing industry in France are:—

Principal
firms.

Société Michelin et Cie at Clermont Ferrand, founded in 1832.
Dunlop Rubber Co., Ltd., at Montluçon.
Bergougnan.
Etablissements Hutchinson.
India Rubber, Gutta-Percha and Telegraph Works Co., Ltd.,
Société Française, B. F. Goodrich Co.

The annual volume of business done by the Michelin Company is estimated at £7,400,000, about 50 per cent. of which is said to represent exports. With capital of 150 million francs, and employing over 10,000 workers, the firm is said to have an output capacity of 12,000 tyres a day. The firm also supplies the wheels. It has contracts with the large motor manufacturers like Citroën, Renault and Peugeot, under which it supplies both wheels and tyres for 70 or 80 per cent. of the output of these firms. In addition to advertising its products directly, the Michelin Company keeps itself before the public by the publication of road guides and the establishment of information bureaux. Michelin principally supplies pneumatic tyres—covers and tubes.

The Bergougnan firm, another large concern, specialises chiefly in solid tyres.

In spite of the name, the Hutchinson firm is entirely French. It employs over 6,000 people and has a large trade in cycle tyres

and solid tyres. Its manufactures are, however, very varied; including footwear, waterproofs, rubbered fabric for balloons and aircraft, hose, jointings, beltings and hygienic goods.

The Dunlop Company employs some 3,000-3,500 workers and has branches in about 20 towns in France. It is organised on the most modern scale, and has been making great headway in the French market. It practically confines itself at present to motor and cycle tyres. In the latter branch it enjoys perhaps half of the trade of the seven million pedal cycles in France. In general, every seller of tyres in France stocks the Michelin pneumatic tyres and the Bergougnan solid tyres. Most of them stock the Dunlop pneumatic tyres.

The India Rubber, Gutta-Percha and Telegraph Works Company is an English firm—the Silvertown Company—and produces all articles in rubber, ebonite and gutta-percha.

The Goodrich Company, a branch of the American firm, owns powerfully equipped works at Colombes.

Apart from these great firms there are several important companies which deal chiefly in rubber manufactures other than tyres.

Range of
French
production.

98. Production, in France, covers practically all rubber goods, with perhaps the exception of the sheeting known as English sheeting (*feuille anglaise*) and of vulcanised thread; and steps are being taken to introduce the proper methods of manufacturing these articles in France.

The French
market.

99. The French industry has practically the complete control of the home market. Imports have remained stationary in face of a manifold increase in the utilisation of rubber manufactures. It is a highly protected market, only those manufactures like sheeting, threads, etc., which are considered as raw materials, being subject to low import duties. The duty on pneumatic tyres is 250 francs per 220 lbs., on solid tyres 200 francs and on each pair of rubber soled shoes, 2.20 francs. The depreciated external value of the franc contributed greatly towards consolidating the control of the home market by French manufacturers.

Production
costs.

100. Production costs in France appear to be considerably lower than in most of the competing countries, particularly the United Kingdom and the United States. It has been stated to us in evidence that wages in France are about 25s. to 30s. for a week of 52-56 hours. It is notable, however, that the wages in the Michelin factory at Clermont Ferrand are higher than in many other factories. For an analysis of the export trade see Section XIII.

XXI.—THE INDUSTRY IN GERMANY.

Position
of the
industry.

101. In 1929, the rubber industry in Germany absorbed 49,100 tons of crude rubber, or 6.10 per cent. of the world output. Little is known of the general rubber industry in Germany and ne

information is available as to the total output of the German rubber manufacturers. A census of production of the tyre industry is taken annually and the details given below regarding this branch of the industry have been taken from the report of the census of 1928 given in "Wirtschaft und Statistik," published by the German Statistical Department.

In Germany there are some 400 factories engaged in all the various branches of the rubber manufacturing industry and the number of workpeople employed is 12,000 to 15,000. Some of the firms engaged in the rubber manufacturing industry represent very large units, and it is estimated that a dozen of them account for 70 per cent. of the total weight of the goods produced. In recent years most of the German factories have been enlarged and reconditioned with new machinery and, though the capital stringency since the stabilisation of the currency has operated as a brake upon production, the German manufacturers have now passed the most critical post-war phase, and, aided by lower labour charges and efficient equipment, are competing keenly in the world markets.

The manufacture of rubber insulated cables is very extensive and the manufacture of surgical and hygienic rubber goods has long been a speciality in Germany. Other miscellaneous rubber goods of all kinds are manufactured in Germany. German manufacturers have been increasing their output and are paying special attention to the export trade.

102. The principal German tyre manufacturers are :—

Continental Caoutchouc & Gutta-Percha Co., Hanover.

Dunlop Co., Hanau.

Harburger Gummiwarenfabrik Phoenix A.G., Hamburg.

Peters Union A.G., Frankfurt.

Vorwerk A.G., Barmen.

Deka Pneumatik, Berlin.

A. G. Metzler, Munich.

Tyres.

The Continental company is the largest manufacturer and it is stated that the company has certain points of contact with the Goodrich company, from which it benefits in American manufacturing methods.

In addition, most large foreign manufacturing firms have agents in Germany for the sale of their tyres.

103. The 1928 census of production which we have mentioned above, was compiled from returns supplied by 23 factories. The number of persons in the industry insured by their trade union was, in 1928, not as high as in the previous year. It was at its highest on the 1st April, 1928, when it was 10,400 compared with 10,700 on the same date in the previous year. On the 1st July, 1928, it was 9,000 whereas on the 1st July, 1927, it was 11,900. Wages and salaries paid during the census year 1928 reached a total of £950,000. The total value of the tyre production at the

Production
of tyres
in 1928.

factory was £10,019,000 a slight increase on the 1927 total. Sales of tyres during the year were valued at £10,579,800 of which £9,580,000 represented domestic sales and £999,800 sales for export.

Progress of
production
of tyres.

104. Numbers of different kinds of tyres produced in Germany in 1928 show an increase in production on previous years in all cases except pedal cycle tyres and solid tyres for motor vehicles. Since the end of 1927 the demand for solid tyres has declined owing to the preference for pneumatic tyres and to the imminence in certain localities of legislation to prohibit the use of solid tyres. The total value of the raw materials used in the tyre industry in 1928 was less than that in 1927, but the decrease was due to the decline in the price of raw rubber. Of the total value of the raw materials used by the 23 factories reporting, namely £5,250,000, crude rubber accounted for about 50 per cent., fabric for 31 per cent., chemicals for 13 per cent. and reclaimed rubber for three per cent. The remaining three per cent. included steel rims for solid tyres and other semi-manufactured materials of steel, iron, wire and the like.

XXII.—THE INDUSTRY IN JAPAN.

Production.

105. As we have shown in paragraph 18, Japan occupies the sixth place in the world production of rubber manufactured goods. In 1929, the Japanese industry absorbed 34,000 tons of crude rubber, or 4.22 per cent. of the world absorption. The following table summarises the official figures of production during recent years:—

Production of Rubber Manufactured Goods in Japan.

Year.	Boots and shoes. £000	Tyres. £000	Other kinds. £000	Total. £000
1920	457	1,522	1,704	3,683
1921	1,264	1,424	1,751	4,439
1922	993	676	2,617	4,286
1923	1,231	1,730	1,747	4,708
1924	1,270	1,498	2,427	5,195
1925	1,392	1,327	2,844	5,563
1926	Not available.	1,616	—	5,665

The manufacture of tyres has not increased since 1923, as that of other kinds of rubber manufactures, due chiefly to the destruction, in the 1923 earthquake, of the works of the Yokohama Rubber Company (a joint enterprise between the Furukawa Company and the Goodrich Rubber Company). The works have been re-erected, and manufacture has recently been restarted.

A great variety of rubber ware is made in Japan, but much of it is of the cheaper grades. The principal manufactures are pneumatic tyres and tubes for motor vehicles, bicycles and rickshaws; boots and shoes; soles and heels; soles for "tabi"*; toys; electrical ware; hose, belting and mechanical goods in general. There are about 460 factories, mostly working on a small scale. Only one factory employs more than 1,000 workpeople. The total number of workers in the industry is between 25,000 and 30,000.

Labour and power are comparatively cheap in Japan, and the market has almost unlimited scope both for meeting the demand in the Japanese Empire and for building up an export trade with neighbouring markets in the Far East.

Few Japanese concerns manufacture motor tyres. The only firm producing them on a large scale is the Dunlop Rubber Company (Far East) at Kobe.

106. The home market is almost entirely supplied from the local factories. Imports, in which motor tyres are the most important item reach a value of some £350,000 a year. It is estimated that 30 per cent. of the motor tyres in Japan come from the United States. The firms that supply them are Goodrich, Goodyear, United States Rubber Company and Firestone. Michelin, Bergougnan and Pirelli tyres are also imported. Details of the imports of tyres into Japan are not available.

The following are some of the principal classes of rubber manufactures apart from tyres imported into Japan:—

<i>Class of Goods.</i>	<i>Approximate Yearly Imports.</i>
Boots and Shoes	170,000 pairs.
Rubber Belting	140,000 lbs.
Rubber Hose	360,000 lbs.
Rubber Thread	160,000 lbs.
Rubber Packing	230,000 lbs.

Some 1,200,000 pounds of scrap and old rubber is imported annually into Japan for making cheap quality boots and shoes and "tabi" soles. It is imported mostly from the United States and China.

107. The annual returns of trade of Japan classify rubber manufactured goods in only three headings, namely:—rubber tyres;

* The "tabi" is a thick sock originally made with a coarse canvas sole. Though originally the national form of footwear, it has been partly replaced by shoes of leather or rubber.

toys of india-rubber or gutta-percha; india-rubber or gutta-percha manufactures.

The total value of the export trade of Japan in rubber manufactures, is summarised as follows:—

Exports of rubber manufactures from Japan.

	1925 £000	1926 £000	1927 £000	1928 £000
Rubber Tyres	947	474	494	572
Rubber Toys	179	148	153	
Other Rubber manufactures.	113	87	96	
Total	1,239	709	743	884

Provisional details of the exports of rubber tyres from Japan during 1928 and 1929 are available. They are as follows:—

Exports of rubber tyres from Japan.

	1928.		1929.	
	Quantity.	Value.	Quantity.	Value.
TOTAL	Tons. 3,030	£ 572,486	Tons. 3,320	£ 630,067
Exported to:—				
Dutch East Indies ...	750	158,187	1,225	242,222
China	1,270	234,088	1,075	203,119
Straits Settlements ...	465	93,418	544	104,569
Kwantung Province ...	344	47,296	278	41,814

Details of the exports of other rubber manufactures subsequent to 1927 are not available.

108. The following table gives the available details regarding the exports of rubber manufactures from Japan in 1925, 1926 and 1927 and the principal markets for the export under each of the three headings. The markets are arranged in descending order of the value of exports in the latest year for which particulars are available—1927.

Exports of Japan.

	1925.		1926.		1927.	
	Tons.	£000.	Tons.	£000.	Tons.	£000.
<i>Motor Tyres. Total</i> ...	4,060	947	2,060	474	2,430	494
<i>Siam</i> ...	1,360	326	695	156	876	166
<i>Nutch Indies</i> ...	1,630	377	846	195	735	160
<i>Malacca Straits Settlements</i>	738	171	370	91	525	113
<i>Sumatra Province</i> ...	230	51	106	23	195	33
<i>Hong Kong</i> ...	67	16	20	4	65	14
<i>French Indo-China</i> ...	10	2	5	1	21	4
<i>Philippine Islands</i> ...	17	4	11	3	18	4
<i>Latex-rubber or Gutta-percha Manufactures. Total</i> ...		113		87		96
<i>Siam</i> ...		38		31		32
<i>Sumatra Province</i> ...		23		26		31
<i>British India</i> ...		11		12		10
<i>Hong Kong</i> ...		9		3		5
<i>Nutch Indies</i> ...		13		4		5
<i>Malacca Straits Settlements</i>		5		3		4
<i>Rest of Britain</i> ...		1		0.3		0.3
<i>Exports of India-rubber or Gutta-percha. Total</i> ...		179		148		153
<i>India</i> ...		46		39		32
<i>United States</i> ...		15		14		19
<i>Nutch Indies</i> ...		17		10		17
<i>Siam</i> ...		25		20		10
<i>Argentina</i> ...		14		12		10
<i>Rest of Britain</i> ...		6		7		8
<i>Hong Kong</i> ...		4		3		9
<i>Malacca Straits Settlements</i>		9		7		8
<i>Sumatra</i> ...		8		9		4
<i>Australia</i> ...		5		4		4
<i>Germany</i> ...		0.4		1		3
	Not recorded.		Not recorded.		Not recorded.	

The preceding table shows that:—

(a) In rubber tyres and general rubber manufactures other than toys, the Japanese markets are restricted to the Far East.

(b) As regards rubber toys the markets are world-wide. In addition to the destinations shown in the table, exports of rubber toys went in 1927 to Canada (£1,100); Holland (£900); Italy (£700); Austria (£500); Denmark (£500); Spain (£400); France (£200); and Sweden (£100).

XXIII.—THE INDUSTRY IN ITALY.

Production. 109. In 1929, Italy held the seventh place in the rubber manufacturing industry judged by the absorption of crude rubber. In that year, Italian manufacturers absorbed 16,200 tons, or 2.02 per cent. of the world supply. There are no statistics of Italian production of rubber manufactured goods. All classes of rubber goods are, however, manufactured in Italy, and the greater part of the local demand is supplied by the Italian industry. Imports of crude rubber have increased steadily since 1922 except during one year—1926.

<i>Year.</i>						<i>Imports of crude rubber. (tons.)</i>
1922	...	...	...	...	...	6,548
1923	...	...	...	...	...	8,729
1924	...	...	...	...	...	9,017
1925	...	...	...	...	...	11,966
1926	...	...	...	...	...	10,472
1927	...	...	...	...	...	11,433
1928	...	...	...	...	...	12,648

These figures include the crude rubber put into stock, and are therefore slightly higher than the figures already given which are the absorption of rubber by the manufacturers.

**Italian
manu-
facturers.**

110. The principal rubber manufacturers in Italy are :—

Pirelli.
S.P.I.G.A. (Società Piemontese Industria Gomma Affini).
Michelin.
Martiny.
Hutchinson.
Bergougnan and Tedeschi.

These six firms employ about 16,000 persons and their aggregate capital is probably in the neighbourhood of 400,000,000 lire (£4,300,000).

The capital of the Società Pirelli—the largest Italian firm—is 120,000,000 lire (£1,290,000) and their annual output is said to be about 200,000,000 lire (£2,150,000). They employ some 10,000 people, and have three factories—two in Milan and one at La Spezia. They also have branches in various towns throughout Italy.

The head office of the Società Prodotti Michelin is in Milan and they have factories in Turin and in Trento. The latter factory is used exclusively for the manufacture of cotton for tyres. They have branches at Rome, Turin, Bologna, Padova, Naples, Florence, Catania and Bari. Their output is about 5,000 cycle

tyres, 3,000 to 3,500 motor tyres and 50 motor cycle tyres a day. At present they are not working on full time.

The Hutchinson factory is in Milan and they have branches in Bologna, Turin, Rome, Naples, Padova and Genoa. They manufacture motor-cycle and cycle tyres, rubber soles and heels and various mechanical rubber goods.

S.P.I.G.A. manufacture pneumatic tyres for cycles and motor cycles and a few aeroplane tyres, in addition to a large assortment of various rubber mechanical goods.

Walter Martiny is the oldest firm connected with the manufacture of tyres in Italy, but their business is small. They chiefly make solid tyres, and only a few pneumatic tyres.

Bergougnan and Tedeschi manufacture, in addition to solid and pneumatic tyres, rubbered textiles, rainproofs and various rubber accessories.

Michelin, Hutchinson and Bergougnan companies are associated with the French firms of the same names.

111. In the trade in rubber manufactures, Italy is essentially an exporting country and imports are comparatively small. The following table gives the imports and exports of Italy by weight in 1926, 1927 and 1928 :—

	Weight in Tons.					
	1926.		1927.		1928.	
	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.
Tyres and Tubes ...	1,447	7,744	1,961	7,990	2,210	8,757
Other goods ...	632	1,878	821	1,788	932	1,961
Total ...	2,079	9,622	2,782	9,778	3,142	10,718

The quantities of tyres and tubes imported into Italy came from the following countries, arranged in descending order of the weight of imports in 1928 :—

Country of origin.	Tons.		
	1926.	1927.	1928.
France ...	877	1,183	885
United Kingdom ...	278	221	530
United States ...	127	303	500
Germany ...	51	65	19
Other Countries ...	114	189	276

Imports of rubber manufactures other than tyres, similarly arranged, were :—

<i>Country of origin.</i>	1926.	<i>Tons.</i>	
		1927.	1928.
United States	128	269	264
France	125	153	220
Germany	102	133	155
United Kingdom	139	123	123
Austria	88	96	102
Other Countries	50	47	68

Markets for
tyres.

112. Exports of tyres and tubes went to the following countries :—

<i>Destination.</i>	1926.	<i>Tons.</i>	
		1927.	1928.
India and Ceylon	454	571	845
Spain	665	396	767
Argentina	458	665	638
Brazil	29	186	555
Dutch East Indies	324	570	524
Belgium	605	456	464
Denmark	324	182	442
Australia	—	—	285
United Kingdom	1,708	1,047	243
France	250	112	48

The trade returns of Italy do not contain sufficient detail for the imports or exports of rubber manufactures other than tyres to be analysed so as to show the trend of the industry in the important classes of rubber manufactures.

XXIV.—THE INDUSTRY IN BELGIUM.

Position
of the
industry.

113. The rubber industry in Belgium has grown very considerably during the last three years. Net imports of crude rubber have been as follows :—

<i>Year.</i>					<i>Thousand tons.</i>
1926 ... ..	...	...	...	...	2.5
1927 ... ..	...	...	...	...	6.6
1928 ... ..	...	...	...	...	8.1
1929 ... ..	...	...	...	...	9.5

No statistics of Belgian production are available, but the increasing imports of crude rubber, the increasing exports and the diminishing imports of rubber manufactured goods, indicate the progress that is being made in the industry in that country.

Rubber goods are made in some 20 factories, but the growth of the industry, particularly in the tyre branch, is due mainly to the efforts of one firm—Englebert of Liège.

114. The imports and exports of rubber manufactures into and from Belgium in 1926, 1927 and 1928 are summarised below; further details of the exports in 1928 are given in Appendix IV, page 102.

	Imports.			Exports.		
	1926.	1927.	1928.	1926.	1927.	1928.
	£000	£000	£000	£000	£000	£000
Sheets, rods, etc. ...	41.1	44.4	47.3	21.1	33.8	30.3
Threads	29.2	37.5	41.0	0.6	0.3	0.2
Tyres	615.0	587.5	553.1	690.0	965.4	1,494.4
Mechanical Goods ...	53.5	66.6	77.6	50.7	42.5	53.6
Boots and Shoes ...	33.4	20.3	44.5	4.3	11.4	36.2
Heels and Soles ...	20.2	24.4	31.4	13.1	12.8	16.2
Toys and Games ...	16.6	18.4	20.4	15.2	24.8	17.2
Surgical Goods ...	20.2	24.6	25.7	3.4	6.4	10.0
Other Rubber Goods ...	48.0	52.1	65.1	25.7	45.5	62.0
Total ...	877.2	875.8	906.1	824.1	1,142.9	1,720.1

115. Exports more than doubled in value in 1928 compared with 1926; in imports little change has occurred in 1926, 1927 and 1928.

Tyres form the greater part of the exports, being 83.6 per cent. of the total in 1926 and 86.9 per cent. in 1928. The chief markets for tyres in 1928 were Germany (£311,000), Netherlands (£270,000), France £256,000) and Great Britain (£108,000), the first three increasing greatly in importance compared with 1927. Imported tyres in 1928 came chiefly from France (£183,800), United States (£128,400), Italy (£98,540) and the United Kingdom (£3,440).

Mechanical goods are another growing export, chiefly to France and the Netherlands, but imports are also increasing; half the imports in 1928 came from the United States and about a quarter from France. Exports of rubber footwear in 1928 were over 8½ times the value of the exports in 1926; about one-half went to the United Kingdom in 1928. Here again, imports are larger than exports in value but, excluding goloshes (which formed one-eleventh of the value of exports in 1928), the weight of exports was much greater than the weight of imports. Both imports and ex-

ports of rubber heels and soles are increasing, the former chiefly from the United States and France; the latter chiefly to the United Kingdom. A smaller value of toys and games was exported in 1928 than in 1927 and went chiefly to France and the Netherlands; imports from France and the United Kingdom are increasing.

Surgical rubber exports go chiefly to the Belgian Congo and India; imports come chiefly from Germany and France. Imports of miscellaneous rubber manufactures come chiefly from Germany and France and, to a much less degree, from the United States and Great Britain; exports in 1928 amounted to 548 tons against 258 tons in 1927, Great Britain taking 211 tons and the Netherlands 175 tons.

Exports of sheets, plates, rods, &c. and thread, which are semi-manufactured goods used in further manufacture, are increasing. Ebonite goods, chiefly imported from Germany and France, were 61 tons in 1927 and 88 tons in 1928; other sheet, &c. imported were 227 tons in 1927 and 270 tons in 1928, 48 tons in the former year and 65 tons in the latter coming from Great Britain. Exports were less in 1928 than in 1927 and went to Germany, France, the Netherlands, and Italy. Exports of thread are trivial but imports are considerable, being in 1928 valued at £41,000.

C.—GENERAL CONSIDERATIONS.

XXV.—NEED FOR MORE UNIFORM STATISTICS.

116. At this point we should like to call attention once more to the need for more uniform statistics. The foregoing paragraphs of this survey afford numerous instances in which comparisons of the trade of different countries in rubber manufactures have been rendered either impossible or have been put forward with several qualifications owing to differences in the methods of collecting and arranging the statistics of different countries. Certain changes were made in 1927 in the trade returns of the United Kingdom which should be of great assistance to the industry but generally little progress has been made in establishing a common nomenclature and classification for rubber goods in the trade statistics of various countries. Greater uniformity and clarity would be of much assistance to the trade and would greatly facilitate the study of the developments of this expanding industry. We believe that this subject of greater uniformity in economic statistics ought to be dealt with internationally and we hope that it will be dealt with by the Committee on Customs Nomenclature now sitting under the auspices of the League of Nations; but whether international agreement can be arranged or not we are of opinion that greater uniformity in the statistics of Empire countries is a necessary prece-

dent to a just understanding of the economic changes and possibilities in the Empire.

XXVI.—TECHNICAL SKILL AND LABOUR.

117. Rubber is a difficult material and the fundamental principles upon which its treatment depends are as yet imperfectly understood. Consequently opportunities for research into its treatment and use exist. We deal in a later section with the provisions made for research and scientific control. During the last 20 years the industry has changed over very largely from traditional rule of thumb methods to the very general use of scientific investigation. Another instance of the change in progress is afforded by the opening of courses on rubber at technical schools. In Great Britain, for example, this educational development has been fostered by the Institution of the Rubber Industry which was founded in 1921 "to promote a better understanding and a closer relationship between all branches of the Rubber Industry and to encourage and widen the scope of technical education in order to secure the well trained Chemist, Engineer, Technologist and Operative to maintain and enlarge the Rubber Industry." The Institution has assisted in founding Rubber Schools in connection with the Northern Polytechnic in London and the Trades School, Manchester. It also conducts examinations and grants diplomas of efficiency in General Rubber Technology, Science (Chemistry and Physics) applied to rubber and in Engineering (Mechanical and Electrical) connected with rubber.

Skilled
labour:
technical
education.

Much of the labour in a rubber factory—the proportion depending of course on the type of goods produced—must be skilled, either as the result of long experience or of technical training combined with experience. Although improvements in factory processes are of great importance, particularly in some of the old established works, it seems very unlikely that rubber manufacture will ever become an automatic process. Skilled supervision will still be required and much of the labour employed will be classified as skilled or at least semi-skilled. For the production of many types of rubber goods labour charges will still figure largely in the productive costs of even the most up-to-date factory.

118. The type of labour in the rubber manufacturing industry depends upon the particular class of goods manufactured. In the rubber shoe and garment making trades, for instance, women workers predominate, while in the tyre trade the number of women is smaller and the greater proportion are men. Throughout the industry, the heavy preparatory operations of compounding, callendering and tubing are carried out by men, the employment of female labour being restricted to making up work where this is relatively light in character. The making of waterproof garments

Variety of
types of
labour.

and rubber shoes involves a considerable period of training and represents skilled labour. The manufacture of articles such as rubber heels, which needs little beyond the plant and labour for mixing and vulcanisation, is not subject to this limitation, and as the essential equipment is comparatively inexpensive, such works can be established without difficulty in any part of the world. A circumstance which tends to localise certain branches of the industry and to increase the size of the economic unit, is the seasonal character of the market for certain classes of goods, for instance, hot-water bottles, football bladders and golf balls. The manufacture of such articles is generally confined to large works covering a range of products so as to facilitate internal labour transference. In certain cases as, for example, in the manufacture of perambulator tyres and dental rubber, the rubber factory forms a small department of a larger works.

Wages in
the indus-
try.

119. It is thus very difficult to attach any definite meanings to figures of the average wages in the rubber industry in different countries. The industry itself is not a unit. Where the rubber factory is, so to speak, incidental to a main trade of a locality or is only a branch of a larger factory, wages naturally tend to conform with those in the main industry. In certain sections of the industry wages run definitely higher than in others. Thus wages in a tyre factory generally exceed those in a waterproofing factory in the same country. Those in a boot and shoe factory differ from those in factories for tyres or waterproofed garments. Thus differences between the average wages of different countries reflect differences in the character of the manufactures of different countries. Comparisons between average wages in different countries are therefore very misleading. We have given in Appendix VI the information regarding "money" wages with which we have been supplied, but we deprecate the institution therefrom of close comparisons between country and country.

Practice in
Canadian
and United
States
Factories.

120. It seems undoubted, however, that wages in the rubber industry in Canada and the United States rule higher than those in the United Kingdom, where also they are generally higher than in factories on the Continent of Europe. The general principles on which wages are earned in rubber factories in Canada and in the United States differ from those followed in factories in Great Britain. Payment at piece rates on output is far more general in Northern America than in England, and earnings depend to a larger extent on the effort of the individual and not even of the "team" of which he may form a part. It is reported that many individual employees attain an exceptional speed in operation. Due very largely to the vast output of standardized articles from large factories the value of output per employee in the United States

is stated to be very high compared with that in Great Britain. In the United States, 1925, £1,828; in Great Britain, 1924, £500.*

XXVII.—STANDARDISATION.

(a) IN THE TYRE INDUSTRY.

121. As in many aspects of this industry, so in the matter of Tyres. standardisation distinctions have to be drawn between the tyre manufacturing and general rubber goods sections. The tyre industry is still relatively young and many changes have been effected in the quality, sizes and dimensions of tyres. Such changes are still in progress and finality has not yet been reached. Alterations in the sizes and shapes of tyres involve manufacturers in very great expense in the making of moulds and changes in plant. Tyre manufacturers generally favour standardisation, which they have endeavoured to obtain, but motor car manufacturers from time to time alter their designs. When a change occurs, tyres of the old type have to be supplied for a long time for the cars already on the road. Thus, in spite of efforts towards standardisation, tyre manufacturers in all countries are compelled to maintain a large number of different types of moulds for varying kinds of tyres. For instance, over 150 different types of tyres are required to meet the needs of cars in the United Kingdom alone. Tyre manufacturers in Canada and the United States have worked fairly closely with the British manufacturers in the matter of standardisation, but the French do not join in at all.

(b) GENERAL RUBBER GOODS MANUFACTURE.

122. Many of the firms engaged in the general rubber goods Industry grown up on specialising. industry are old-established and conservative in their methods. This applies particularly to the firms in the United Kingdom and on the Continent of Europe. The industry has grown up through the manufacturer making the article required by the purchaser and not through the manufacturers giving purchasers a lead by establishing a trade in branded standardised articles. Some manufacturer can generally be found willing to work to a particular order. Intense competition in the industry has also prevented standardisation in many of its branches.

123. This lack of standardisation results in uneconomical methods of working, and checks the adoption of Commercial practices which might be of great benefit to the industry—such as co-operative advertising and the use of a general trade mark. Standardisation and co-operative advertising

124. Many striking examples of the present lack of standardisation in the rubber industry could be quoted. We will mention three, which we do not doubt could be paralleled by instances in Examples of lack of standardisation.

* Trade Information Bulletin No. 644 published by the United States Bureau Foreign and Domestic Commerce.

other countries. Practically every marine engineer in the United Kingdom insists on a different colour being given to the rubber used in packing the joints of engines. About 50 different sizes of belts are in use in the United Kingdom for driving motor cars, all within a millimetre of one another in size and, similarly little difference in shape. An analysis of the catalogues of four firms in the United States revealed that the number of varieties of rubber boots and shoes exceeded 77,000.* This enormous number relates to pairs, ignoring the difference in shape between right and left boots or shoes.

Functions
of rubber
industry.

125. Any generalisation, however, regarding standardisation in the rubber manufacturing industry must be modified by very careful consideration of the different classes of goods manufactured and the purposes they serve. The functions of the rubber manufacturing industry may be divided into three main classes, namely:—

- (a) service to other industries and trades;
- (b) production of finished articles, like boots and shoes, some sports goods and surgical goods, in regard to which manufacturers' brands and trade names are being established; and
- (c) production of cables and thread (or elastic), where the rubber is only a portion of another manufactured article.

While it is true, therefore, that possibilities exist for a greater measure of uniformity of practice in many directions, and that, in the past, unrestricted competition has done considerable damage, by tending to reduce the level of quality, it is necessary to proceed carefully in the matter of standardisation, for with a material such as rubber, which is put to a great many uses, too wide standardisation may do more harm than good.

Standard-
isation in
the United
Kingdom.

126. The problem of standardisation has not been overlooked by the manufacturers in the United Kingdom. There is, at the present time, a distinct movement in the industry towards standardisation of the manufactured articles produced and towards a reduction in the number of varieties of the same kinds of articles manufactured. Recently, at the request of the India Rubber Manufacturers Association, the British Engineering Standards Association has prepared a specification for machinery belting. The result of the adoption of this specification has been that rubber transmission belting has already become superior in quality to that obtainable before the negotiations began some two years ago, and is rapidly superseding, so far as transmission drive is concerned, other makes of belting which are used as alternatives to leather. The trade association concerned, in conjunction with the Rubber Research Association of British Rubber Manufacturers is at the

* "The Reign of Rubber," by N. C. Geer, 1922.

present time engaged in establishing a minimum standard of quality for moulded rubber hot-water bottles. These articles contain no fabric re-inforcement and depend entirely upon the strength of the rubber.

127. A Committee of rubber technicians is also conferring with the Technical Co-ordinating Committee on Government Supplies for the purpose of arriving at a specification in regard to types of rubber to be supplied to Government Supply Departments. This technical co-ordinating committee is composed of representatives of the Admiralty, the Air Ministry, the War Office and the General Post Office. It has under consideration the reduction of the varieties of grades of rubber manufactured products to five types. Negotiations are well advanced, and it is hoped that, in the very near future, all United Kingdom Government Supplies will be based on the specification that may be agreed. Steps are also being taken in the direction of standard specifications for rubber proofing in connection with Balloon Fabric, and for rubber flooring. Committees have been formed in connection with ebonite and hard rubber goods, for the purpose of drawing up specifications for (1) rubber employed in panels for wireless, and (2) for hard rubber used for electrical insulating purposes.

128. These attempts at standardisation form a starting point for investigation into the many directions in which a greater uniformity of practice is both possible and desirable.

129. The general question of standardisation of rubber goods has probably received more attention in the United States than elsewhere. The United States Bureau of Standards has standardised 71 specifications covering amongst other articles rubber packing, hot water bottles, rubber cement, rubber hose, matting and gloves.

Standardisation in the United States.

130. The recognition throughout the Empire of common standards and specifications for the same goods would exercise a potent influence on the growth of Inter-Imperial trade, quite probably more important in many cases than preferential tariffs. The subject therefore, difficult though it be, has results far beyond the simplification of factory practice.

Influence of standardisation on Inter-Imperial trade.

XXVIII.—MINIMUM PRICES—STANDARD COSTING SYSTEM.

131. Standardisation of articles must almost inevitably lead to the adoption of standard methods of costing. In the absence of accepted standard specifications there is a definite temptation for manufacturers to adjust the proportions of their rubber mixtures to meet the price desired. The existence of a hall mark which would be affixed to articles conforming to agreed standards of quality and price would protect customers against inferior quality.

Agreed prices for minimum standard qualities

For some time the rubber industry in the United Kingdom has endeavoured to reach agreement on the minimum price for the lowest quality of any article manufactured, and a certain amount of success in certain lines has been achieved. Price maintenance is only possible however, if a fair price is fixed. If the price is fixed too high the door is opened for price cutting and secret agreements. On the other hand a minimum price for a stated minimum quality would concentrate competition on the quality of the article made rather than chiefly on the price. Without an agreed minimum price it is difficult to maintain a minimum standard of quality. The manufacturers of Canada and the United States, who compete keenly in the United Kingdom market, have come into the arrangements which have already been made. Agreement with European manufacturers has been more difficult and in many lines impossible. Incidentally, the competition from the European manufacturers prevents the minimum prices from being fixed too high. Always bearing in mind that the rubber industry covers a very large number of different trades, the United Kingdom manufacturer does not suffer unduly from the competition of the manufacturers of Canada or the United States who make and maintain good quality products. The chief difficulty is with certain continental manufacturers exporting cheap and often inferior goods. There is no dumping in the strict sense, but in some instances, continental wages are low and the quality is often poor with the result that the goods sell at cheap prices.

Minimum prices already operating.

132. Minimum prices for lowest quality already operate in respect of :—

- (1) Hose and other mechanicals.
- (2) Hot Water Bottles.
- (3) Certain varieties of Sports goods, such as football bladders.

An international price convention is in operation in regard to playing balls, boots and shoes, ebonite and hard rubber goods. These price conventions have already benefited the industry and checked the lowering of quality resulting from excessive competition. They have operated as a factor in reducing distribution costs, as purchasers buy in larger quantities when there is stability of price. The discussions necessary have led to a very valuable interchange of information in regard to general costs and methods of manufacture.

Rationalisation of the industry.

133. The report made by a leading firm of Accountants to the India Rubber Manufacturers' Association on the possibility of standard costing throughout the industry contains the following paragraph :—

“ It appears to us that the majority of concerns in the industry continue to exist to-day in varying degrees of profit-

ability by reason of certain 'main lines' which are providing profits that are greater than the losses made on a number of other lines, although owing to present Costing methods these other lines may even be thought to be profitable. Unless true costs are known, increased turnover would tend to be obtained by each Company in those goods most heavily subsidised by the profits of its 'main line' and in consequence not only would the profits of that company be diminished, but the market prices for those other lines would probably become unprofitable for the other Companies also."

The truth of this statement is generally recognised, and there is little doubt, that, as the result of the production of this report, a determined attempt will be made to adopt a system of rationalization in the rubber industry of the United Kingdom. Signs are not lacking that this movement is already developing in a number of ways. Such a movement will definitely give the United Kingdom industry a progressive policy which should improve its position as one of the staple industries of the country. If in all these measures substantial agreement in the trade throughout the Empire can be obtained, the competitive position of the rubber industry of the Empire should be strengthened.

XXIX.—RESEARCH.

134. In the section of our report dealing with technical skill and labour we alluded to the change in progress in the rubber industry from rule of thumb methods to greater scientific control. The custom to employ chemists in rubber works is becoming increasingly general. In many cases they are as yet chiefly engaged on questions of works maintenance, the examination of samples and the solution of everyday factory problems. But several of the larger, more progressive units maintain development sections, the personnel of which, freed from routine work, are able to give their undivided attention to the study of new materials, of special factory problems and processes, and of new applications and uses of rubber.

Scientific
progress.

135. In the main, therefore, the scientific research which is in progress is initiated and conducted by special staffs connected with and employed by the large firms in different countries. We are informed that in the United States and Canada, although no formal association exists in the industry for the promotion of scientific research into rubber, informal interchange of experience between the various firms is fairly general.

Mainly the
work of
the large
firms.

136. A beginning in co-operative scientific research on the part of the rubber manufacturers was made in the United Kingdom in

Co-opera-
tive
scientific
research.

1920 with the formation of the Research Association of British Rubber Manufacturers which was organised with assistance from the Department of Scientific and Industrial Research. The Association does not take the place of the scientific staffs at works, but supplements their activities. Its primary function is to undertake fundamental investigations into the utilization of rubber for which the factory laboratory has frequently neither the time nor the facilities, and to disseminate scientific and technical data and information regarding the treatment of rubber, and apparatus for laboratory and factory control.

Research
Association
of British
Rubber
Manu-
facturers.

137. The problems already dealt with in the laboratories of the Association cover a wide range of general interest to all sections of the industry. In addition a Library and Information Bureau has been developed in which the information in scientific and technical journals bearing on rubber is classified and indexed. The abstracts so obtained form the basis of the "Summary of Current Literature" which is issued monthly to members. The organization of a section dealing with trade and commercial intelligence of interest to the rubber industry was contemplated but is at present in abeyance. Some 300 university graduates in science are now employed in the various branches of the rubber industry in the United Kingdom and the Association focus much of their activities to attracting the attention of manufacturers to the services which trained scientists can render.

138. The Association is organised on a voluntary basis. In accordance with general practice the grants made by the Department of Scientific and Industrial Research have decreased; in 1925 they were £2,000; in 1928 they were £800. It is estimated that, excluding the cable manufacturers, the firms who are members of the Association utilise about 70 per cent. of the raw rubber absorbed by industry in Great Britain and represent about 70 per cent. of the capital invested in the industry. Considerable difficulty has been experienced in arriving at a basis for the assessment of contributions. The wide range of products covered by the rubber industry, and the variation in the proportion of rubber used in manufacturing different articles rendered difficult assessments based on the value of output, or of capital employed in the industry. A large measure of agreement was obtained in 1929 to the imposition by statute of a levy at the rate of 1/25 of a penny a lb. on rubber used in manufacture in the United Kingdom. If this measure had been passed into law the Research Association would have received in 1929 an income of some £15,000. The pressure of Parliamentary business, however, prevented its consideration. Steps are being taken to finance the Association by voluntary subscriptions supplemented by departmental grant.

XXX.—TENDENCIES IN THE RUBBER INDUSTRY.

139. The expansion in the production of rubber and in its use during the present century has been such as frequently to belie both pessimistic and optimistic forecasts. The rubber industry depends, as to 80 per cent. of its output, on tyres, which find their market in the motor and cycle industry. The prosperity or reverse of the motor industry therefore dominates the whole of the rubber manufacturing industry, for not only have variations in the fortunes of the motor industry a direct effect on the demand for rubber, but they cause obvious indirect repercussions upon the remaining rubber industries by their effect on the price of the raw product. The demand for rubber in the motor industry may also be affected by changes in the manufacture of tyres. The chance always exists of the discovery of some process which will render possible the manufacture of a tyre of equally long life and containing less rubber. Apart from that possibility, the rate of absorption of rubber is at present set by the pace at which motor transport is adopted throughout the world, and in this the degree to which different countries are approaching "saturation point" for motor cars is an important factor.

The motor industry.

140. The production of rubber in the East has, however, developed more rapidly than the demand for rubber in the motor industry. There has therefore been an increasing margin demanding an outlet for other purposes. In 1928 some 140,000 tons of crude rubber were used in industry in the world for purposes other than the manufacture of tyres. This quantity exceeded by 40 per cent. the total world production of rubber in 1913—only 15 years earlier. In spite of this remarkable fact, the rate of absorption of rubber into industries other than tyres has not kept pace with the increase of supply and has therefore, from the point of view of producers, appeared disappointingly slow. The Rubber Growers' Association have, from time to time, striven to find new uses, as for instance in flooring and roadways, which, if adopted, would absorb large quantities of rubber.

Need for new uses for rubber.

141. There is no doubt that the use of rubber will extend. Its qualities for absorbing shocks, for reducing vibration, for insulation, for resisting surface abrasion, will result in its wider use in connection with running machinery, electricity, lining for ball mills, conveyors, and the lining of containers in chemical works. During the rapid growth of the last 30 years wide fluctuations in the prices both of the raw material and of the finished products have occurred. Centralised schemes for controlling production of rubber have been organised, but have successively broken down, yet there can be no doubt that greater stability in price and greater regularity in offerings would be in the interest both of the producer and of the user. The latest scheme, put forward in November, 1929, by the Rubber Growers' Association aimed at reducing the

Extension of the use of rubber.

number of independent sellers by grouping them into a comparatively small number of selling organisations. On the manufacturing side the tyre industry is already concentrated in powerful hands. In regard to the rest of the industry, much scope exists for closer working arrangements with a view to the concentration of factories into larger units, the conduct of research, the distribution of information and the establishment of recognised grades and standard specifications.

H. J. MACKINDER (Chairman).

THOS. ALLEN	}	United Kingdom.
F. N. BLUNDELL		
HARRISON WATSON		Canada.
F. L. McDOUGALL	}	Australia.
A. E. GOUGH		
J. H. DIMOND		South Africa.
R. S. FORSYTH		New Zealand.
J. W. DULANTY		Irish Free State.
W. C. JOB		Newfoundland.
A. C. CHATTERJEE		India.
F. J. NEWTON		Southern Rhodesia.
G. GRINDLE	}	Colonies and Protectorates.
J. H. BATTY		
D. T. CHADWICK		(Secretary).
T. L. CATLING		(Assistant).

17th December, 1929.

While this report was passing through the Press, certain trade figures became available, and, by leave of the Committee, have been incorporated in the text.

H. J. MACKINDER,
(Chairman).

March, 1930.

APPENDIX I.

NOTE ON THE DEVELOPMENT OF THE RUBBER PLANTATION INDUSTRY.

The history of the rubber plantation industry in the East began in 1875. Seeds of *Hevea* obtained from Brazil by Mr., later Sir Henry, Wickham in circumstances which are well known, were germinated at Kew and the seedlings were sent out to Ceylon about 1876. From these seedlings the whole of the plantations in the East have developed. Progress at first was slow, as it was not certain whether the *Hevea* tree was the most adaptable for plantation growing in the East. It was not until 1890 that the superiority of *Hevea* was generally recognised. Planting was rather spasmodic up to 1900. Then the improvements made in the internal combustion engine rendered motor transport a very strong probability, and from 1900 to 1905 there was a growing demand for rubber for motor tyres. In 1900, the world production of raw rubber was about 40,000 tons, dry weight, and all went into boots and shoes, water-proof goods, mechanical goods, bicycle tyres and various other kinds of goods. From 1900 to 1905 there was not a great deal of planting, but the high price of rubber, 4s. to 5s. a lb., stimulated planting from 1905 to 1910, and during this period planting was carried on at a great rate. In 1910 came the rubber boom. Demand outran supply, and the price went up to 12s. 10d. a lb. A large number of new companies were floated and a very large amount of planting was done in 1910, 1911 and 1912. From 1912 onwards there was a decreasing amount of planting on European estates and an increasing amount by Malays and Chinese. The European estates had prepared planting programmes during 1910 and 1911 and up to 1916 were mostly engaged in carrying them through. In Malaya, land was granted for rubber on the condition that a certain area was planted each year. But between 1910 and 1912 the natives in Malaya and the Dutch East Indies started to grow rubber on their small holdings, and this native planting during the succeeding years was very considerable. Thus, between 1913 and 1920, new planting on both European estates and native holdings was considerable.

No precise details of the area planted during each year since the beginning of the industry are available. The following table, supplied to us by the Rubber Growers' Association, shows approximately in round figures the increase in the area planted from the end of 1904 to the end of 1928:—

Area planted at the end of:—	Acres.
1904	50,000
1909	1,000,000
1912	2,000,000
1920	4,400,000
1924	4,700,000
1928	6,250,000

Of the total area planted at the end of 1928, some 3,600,000 acres are within the British Empire and 400,000 acres belong to British companies operating in the Dutch East Indies. The total figure also includes a very rough estimate of 1,050,000 acres of native-owned plantations in the Dutch East Indies.

In 1920 came a rubber slump. No doubt the general trade depression had some effect, but the slump was chiefly due to improvements in the manufacture of tyres introduced in 1918 and 1919 which gave more tyre mileage for each lb. of rubber used. About the end of 1919 another rubber

boom had been expected. It might have materialised but for these improvements in tyre manufacture. Instead of a boom came a slump, however, and the planting industry has not yet quite recovered from the effects of that slump. There was practically no new planting from 1920 to 1922. There was a little in 1923 and in the early part of 1924. In the last three months of 1924 came a considerable rise in price and a tremendous rise in 1925. That started new planting, especially in the Dutch East Indies, and in 1925, 1926 and 1927 there was a very large amount of planting by the natives. This is not altogether new planting, because the native not infrequently taps his holding in a most drastic manner without consideration of the life of his trees. Thus a good deal of the new planting done by natives in the Dutch East Indies is to replace trees which will sooner or later cease to produce. It takes from five to six years from the time of planting of the trees before a commercial crop can be harvested. The output of a tree increases up to 12 to 14 years. After that, it remains stationary for a while, and then it probably declines. The average productive life of a rubber tree is really not known since planters have had only about 25 years' experience of the plantation industry.

Wild rubber from Brazil and Africa is now practically negligible, being less than 5 per cent. of the total world's marketable supplies. In 1900 Brazil, Africa and Central America supplied all the world's rubber, Brazil roughly two-thirds of it. The highest output of wild rubber was in 1910 and 1911, when it reached 60,000 tons, dry weight, per year. In 1928 not more than 25,000 tons of dry rubber will be obtained from those places. It is doubtful whether even with a higher price, of 1s. 6d. or 2s. a lb., these countries would produce more than 30 to 35 thousand tons of dry rubber. In Brazil, the more accessible trees have been tapped for many years and are rather exhausted. It does not pay to work the numerous trees in the more inaccessible regions. In Africa the wild rubber has been dying out since 1910 owing to the destructive methods adopted in tapping the trees. Thus wild rubber is not an important factor to-day.

The 1920 slump.

In spite of a good demand in 1918 for rubber in America and other countries, falls in the local prices of rubber in the East occurred, owing to the scarcity of shipping, which was required for transporting troops and war material. Thus, whilst during 1917 and 1918 the London prices were from 2s. 6d. to 3s. a lb., local prices in the East were below 1s. par lb. With the release of shipping after the Armistice, the situation improved, and during 1919 large quantities of rubber were shipped. The demand was encouraging and no one foresaw that in less than two years the plantation industry would be experiencing the worst slump it has had to face. The slump was partly due to general trade depression in 1920, but was largely due to the improved manufacture of tyres. In the days of the old fabric tyre, five tyres a year were required for each car. By 1920 the new cord tyre was in use; only three per car were required each year. Cord tyres contained more rubber than the old fabric tyres, but were much more durable. In the middle of 1920, manufacturers found themselves with large forward commitments of crude rubber at prices ranging from 2s. 6d. to 3s. per lb. and with stocks of manufacturers' goods largely in excess of the current demand. Manufacturing activity was drastically curtailed, the demand for crude rubber dropped, and the resulting fall in price was intensified by the re-sale of crude rubber by manufacturers. Owing to the multiplicity and diversity of the nationality of the producers, it was impossible to effect an immediate curtailment of shipments, and it proved impossible, for the same reasons, to get a sufficient amount of support for any effective voluntary scheme of restriction of output.

Restriction.

By 1921, stocks of raw rubber were heavy and relief seemed remote. The United Kingdom Government had during 1920 been asked to regulate shipments of rubber from Malaya and from Ceylon. State action was at first refused. But, in 1921, affairs in the Malay States were approaching a general crisis. Rubber was selling below the cost of production and the tin market was depressed. Government revenues were dwindling; large sections of the native population were faced with unemployment and ruin; estates were reaching the end of their financial resources. An American financial combine, with a capital of £50,000,000, had been formed to buy estates at knock-out prices as opportunity offered. These dangers were averted by the introduction of the Stevenson Scheme.

THE STEVENSON SCHEME.*

The scheme established a minimum rate of export duty, and at the same time provided that a duty rising to prohibitive rates should be imposed on total exports if they exceeded the amount fixed in accordance with the scheme. The scheme pivoted on a London price of ls. 3d. a lb. for raw rubber, which permitted estates to be maintained in good order and a moderate profit to the plantation owner. The Dutch refused to come into the scheme, but the British estates in the Dutch East Indies—representing 25 to 30 per cent. of the output of the Dutch East Indies—voluntarily agreed to regulate their exports according to the scheme, if it were compulsorily applied in Malaya and Ceylon. Growers in Sarawak, Borneo and Southern India also agreed to a scheme of voluntary restriction. Under the Stevenson scheme the productive capacity of each estate was assessed by Committees in the East. This assessment, known as "standard production," gave originally a fair idea of the productive capacity of the estate on a moderately liberal system of tapping, and the assessments were annually revised. The percentage of the "standard production" which each estate could export on payment of the minimum rate of export duty during any quarter was to be regulated by the average price of "standard quality, smoked sheet," in the London market during the previous quarter. The initial percentage was fixed at 60, that is, for the first quarter in which the scheme was in operation, each estate was allowed to export, at the minimum rate of duty, 60 per cent. of its "standard production." It was laid down in the scheme that if the average price of rubber were ls. 3d. a lb. or over during any quarter, the percentage that could be exported at the minimum rate in the following quarter would be increased by 5. If the price were ls. 6d. or over, the percentage would be increased by 10. If the percentage was over 65 and the price was under ls. 3d. but over ls. the percentage in the following quarter would drop by 5 until it got down to 60 per cent., but the percentage would not fall below 60 unless the price fell to less than ls. a lb. But if the price fell below ls., no matter what the percentage for that quarter was, the percentage for the following quarter dropped to 55. This particular proviso never came into force. The percentage rose to 65 during the third quarter of the operation of the scheme, and then again fell to 60 and remained at that figure for a year. In the May-July quarter, 1924, however, the price was below ls., the percentage was reduced to 55, and thereafter under the scheme it could fall by 5 each quarter until the price got over ls. 3d.

* See Report of a Committee appointed to investigate the Rubber Situation in British Colonies and Protectorates—Cmd. 1678, and Supplementary Report—Cmd. 1756.

At the end of 1924 the percentage had fallen to 50, inducing a severe shortage of rubber in 1925, when, as will be explained below, an unexpected increased demand for rubber materialised. A modification of the scheme was introduced later whereby, whatever the price, the minimum percentage for export was fixed at 60 per cent. standard production.

The United States and the restriction scheme.

The scheme met with very adverse criticism in the United States, although American manufacturing interests had been strongly urging price stability. Stability round about 1s. 3d. a lb. could possibly have been achieved if they had regulated their buying policy in accordance with the provisions of the scheme. 1s. 3d. was a price that did not give very much profit to the growers, but the manufacturers, who, two years before, had been willing to pay 2s. 6d. and 3s. a lb. for long forward contracts, decided, soon after the restriction scheme was imposed, to buy "from hand to mouth." Manufacturers, especially in the United States, did not expect that the scheme would be adopted, and, when it was brought into force on the 1st November, 1922, they were short of rubber. This gave an opportunity to the speculator, and three months after the scheme came into operation, the price was carried up to 1s. 7d. a lb. Thereafter the price fell and manufacturers generally neglected to cover their forward requirements even when the price was as low as 1s. a lb. in the last half of 1924 resulting in the reduction of the quota for the last quarter to 50 per cent.

The effect of the low-pressure tyre.

In 1925 came the new low-pressure tyre. The demand for this type of tyre has increased rapidly. To-day about 70 per cent. of the tyres made in America are low-pressure tyres, while in 1925 they were only about 12-14 per cent. Manufacturers, in 1925, realised that this tyre would become immensely popular—as it is a better shock-absorber, and lengthens the life of the car—but it then required on the average 2 lbs. more rubber for each tyre. The effect of the new demand for low-pressure tyres was to increase the demand for rubber without affecting the demand for tyres. In 1925 the price of rubber rose from 1s. 6d. in January to 4s. 6d. in June, fell to about 3s. 6d. and then rose to 4s. 8d. in December. From February, 1926, to the end of that year exports at full standard production were permitted. From May, 1927, to November, 1928, when the restriction scheme was removed, the percentage of standard production exported remained at 60.

Effects of the violent price-fluctuations in 1925.

The violent price-fluctuations in 1925 were not good for the industry. Producers did not want them. Tyre manufacturers put up prices in greater proportion than the increase in the price of rubber, and 1925 was one of the most prosperous years for them. But American manufacturers were convinced that a shortage was coming. They were buying forward into 1926 at prices round about 4s. a lb. The price, however, dropped from 4s. 8d. in December, 1925, to 1s. 9d. in June, 1926. That entailed enormous losses to the manufacturers. In the shortage scare of 1925, many American purchasers had bought spare tyres, so that in addition, the demand for tyres in the first half of 1926 also declined. Manufacturers ceased buying rubber and used their stocks. The price fell to 1s. 9d. The scheme was recast in April, 1926, and the pivotal price raised to 1s. 9d.—mainly to help the manufacturers over a very bad time. But even then people had the idea that the slump was only temporary, and that prices would rise again to 2s. and 2s. 6d. a lb. That again proved to be wrong, owing to several factors. There was intense economy propaganda in the United

States and cheap tyres were turned out containing reclaimed rubber. Manufacturers were successful in building a low-pressure tyre which did not contain on the average any more crude rubber than the old high-pressure tyre. Thus, instead of the expected increase in the absorption of rubber in 1928, there was a decrease, which amounted to about 25,000 tons in the United States alone, where an increase of 25,000 tons had been expected.

The lower-grade tyres made in 1926 and 1927 did not stand up to the wear required, and in 1928 and 1929, the manufacturing industry benefited from the increased replacement demand. During the operation of the scheme production in the Dutch East Indies was largely increased, and the United Kingdom Government removed all control over exports with effect from the 1st November, 1928, in which month the price on the London market fell to 8.52 pence a lb. The following table, based on figures published by the Rubber Growers' Association, shows the exports of raw rubber from the producing countries from 1925 to 1928.

Years.	British Malaya.	Dutch East Indies.	Ceylon.	India.	British North Borneo.	Sarawak.	French Indo-China.	Siam, etc.	Total Plantation.	South America.	Other Wild.	Total Wild.	Grand Total.
	Thousands of tons.												
1925	210	189	46	10	6	9	6	4	480	28	10	38	518
1926	286	204	59	10	6	10	7	4	586	25	9	34	620
1927	242	229	55	11	7	11	8	4	567	28	10	38	605
1928	296	225	58	11	7	11	9	4	621	21	6	27	648

APPENDIX II.

INTERNATIONAL TRADE IN RECLAIMED AND SOBAP RUBBER.

1.—Reclaimed Rubber.

Reclaimed rubber enters into international trade, but no complete picture of this trade can be presented as many countries do not specify reclaimed rubber in their export or import returns.

The following table shows the trend of the exports of Reclaimed Rubber from the countries that record such exports:—

Country.	1925.	1926.	1927.	1928.	Chief markets in 1927.
	Quantities in lbs. 000.				(Quantities lbs. 000 in brackets.)
United Kingdom.	3,575	4,583	5,681	4,768*	Germany (1,997) Finland (497) Spain (389) Empire Countries (561)
United States	10,240	12,076	19,130	21,453	Canada (15,034) United Kingdom (2,031) Australia (1,313) Japan (181) Sweden (131)
Italy	324	242	1,122	303	No details available.

The export returns of Sweden, the Netherlands and Poland show that they export small, but increasing, amounts of reclaimed rubber. There is no heading for this commodity in the Canadian returns. Germany and France export considerable quantities of reclaimed rubber, but details are not furnished in the export returns.

2.—Scrap or Waste Rubber.

Concomitant with the growth of the trade in reclaimed rubber, there has grown up a trade in old and disused rubber articles, mostly tyres, shoes, belting and hose. The following table shows the growth of the export trade in waste and scrap rubber:—

Country.	1924.	1925.	1926.	1927.	1928.
	Thousands of lbs.				
United Kingdom	8,260	18,298	19,221	21,410	27,490
Canada	2,753	14,065	14,636	14,248	16,673
South Africa... ..	36	5,965	1,158	14	*
United States	21,452	30,951	29,843	31,332	45,325
Germany	1,422	2,129	7,254	4,956	6,988
Netherlands... ..	1,289	2,912	3,717	4,842	7,677
Finland	170	129	239	155	*
Sweden	480	1,190	589	1,003	*

* Not yet available.

Markets
for scrap
rubber.

The chief markets for scrap rubber exported from the United Kingdom, Canada and the United States in 1928 were as follows:—

Figures in brackets are lbs. 000. Chief markets in descending order.

United Kingdom.	Canada.	United States.
France (10,298)	United States ... (14,629)	Spain (12,414)
Germany (5,002)	United Kingdom (10)	Germany (8,547)
Spain (4,976)		France (7,496)
United States ... (1,530)		Canada (5,300)

Uses for
scrap
rubber.

Although the bulk of the trade in scrap rubber serves the reclaiming plants, a certain amount is used for making up cheap articles. Old solid tyres are used for rubber heels and bumpers, and disused inner tubes for rubber bands. According to the United States Department of Commerce, in several countries, particularly in Mexico and Greece, old motor outer covers are used to make a rough kind of footwear. Old covers are imported into Greece chiefly for making this type of footwear and one outer cover provides three pairs of these primitive shoes.

APPENDIX III.

NOTE ON THE OFFICIAL STATISTICS RELATING TO THE RUBBER MANUFACTURING INDUSTRY.

Production. Of the chief countries in which rubber is manufactured to a considerable extent, only five—the United Kingdom, Canada, Australia, the United States and Japan—publish official statistics of the production of Rubber

Manufactured Goods. The German Statistical Department publishes annually particulars relating to the rubber tyre industry only. The following table summarises the particulars published regarding the value of the production of Rubber Manufactured Goods:—

Country.	Year of Census.	Tyres and Tubes.	Other Manufactures.	Total.
		£	£	£
United Kingdom	1924	10,382,000	11,087,000	21,469,000
Canada	1928	10,218,000	9,764,000	19,982,000
Australia	1927-28	details not given.		7,054,848
United States	1927	160,397,763	91,964,198	252,361,961
Japan... ..	1926	1,616,000	4,049,000	5,665,000
Germany	1928	10,050,000	details not	available.

Two other countries—France and Italy—manufacture rubber goods to a value comparable with those manufactured in the United Kingdom, Canada or Germany and Belgian production is comparable with that of Australia and Japan. But these countries do not publish any details of production.

As far as we have been able to ascertain, no details of production are published in the other producing countries.

In the table given above, the output of the United Kingdom includes not only the production of the rubber industry proper, but also the value of rubber-proofed garments made in the clothing industry and of games and toys made in the sports and toy trades. The production of the United States and Canada excludes these items. No further information regarding the output of Australia and Japan is available.

STATISTICS OF IMPORT AND EXPORT TRADE.

The returns of imports provide little comparable data. The countries which import rubber manufactures are much more numerous than those that export them, and the imports of particular classes of rubber manufactures are, in many cases, so insignificant that they are not given separate headings in the import returns. Import returns.

As the chief exporting countries are few, the export returns of these countries furnish the data for a statistical survey of the international trade in rubber manufactured goods. Even in the export returns of these few countries, there are so many significant differences of classification that a complete comparison of the trade of the various countries is not possible. Although there are differences in classification between the export returns of the United Kingdom, Canada, the United States and Germany, it is possible to make, in many instances, reliable comparisons. The classification of rubber manufactured goods adopted by France and Italy render impossible any detailed comparisons between their trade and that of the other principal exporting countries. Export returns.

All the export returns give the value of the exports under each heading. Comparisons based on value, however, may be unreliable, chiefly on account of the considerable price changes that have occurred in recent years. In spite of differences in the methods of recording quantities, some countries recording numbers and others weight, comparisons of the exports are possible for the most important classes of rubber manufactured goods. Comparisons: based on value; based on quantity.

Headings
in exports
returns.

A table attached to this note compares the headings in the export returns of the principal exporting countries. The unit of quantity recorded under each heading in the returns of the various countries is also given.

Difficulties
in making
compari-
sons.

Certain characteristics of the rubber manufacturing industry very greatly enhance the difficulties of analysing the trade statistics. The chief of these difficulties are:—

1. The extraordinary variety of goods made of rubber or in which rubber forms an important or essential part. An official report recently issued in the United Kingdom states: "Few industries use a wider range of raw materials or manufacture products put to more diverse uses than the rubber industry."* As, in the trade returns of all the manufacturing countries, this wide variety of articles is classified under a comparatively few headings, it is very difficult, and in many cases, impossible, to know whether the same kinds of goods are included under similar headings.

Instances of this difficulty are:—

Rubber Footwear—whether rubber soles and heels are included—whether the trade is predominantly one in light canvas shoes or heavy waders or wellingtons.

Hard Rubber or ebonite goods—whether these are included under the articles of which they form an important part but not the whole, such as surgical rubber goods, or whether—as in the German returns—they have a separate heading. In the latter case one cannot be sure that these do not include other kinds of rubber or other materials which form a part of the article classified as of "hard rubber."

2. Even in so-called rubber goods "other" materials frequently form so large a part of the value that comparisons may be very misleading.

Examples:—

Cotton fabric forms about half the value of motor car outer tyres. Cotton or other fabric enters into the manufacture of many rubber articles, such as clothing, elastic goods, rubber boots and shoes. Rubber is only a fractional part of the weight (or value) of insulated wires and cables. Variations in the weight or value of these incorporated materials may make great differences in the weight or value of goods classified as "rubber manufactures" without giving any indication of the quantity or the value of the rubber used in their manufacture.

3. It is necessary—when considering figures of exports—to bear in mind the relative importance of the different branches of the rubber manufacturing industry in different countries.

Thus, in comparing the exports of the United States and Germany, it should be borne in mind that rubber manufactures other than tyres formed 14 per cent. (in 1927) of the rubber goods exported from the United States and 78 per cent. of those exported from Germany. Changes in the exports of these goods from Germany will therefore reflect very much greater variations in the state of the rubber industry as a whole in Germany than they will in the case of the United States.

5. Since tyres form usually a very great proportion of the rubber manufactures of the principal producing countries, the total trade in rubber manufactures as well as that in tyres will depend very greatly

* Report for 1927-8 of the Department of Scientific and Industrial Research, page 142.

on the state of the motor vehicle trade, and the distribution of the exports from these countries will depend very largely on their position in the markets for their motor vehicles.

6. The almost complete lack of standardisation in the rubber industry vitiates any comparisons—particularly those based on numbers of articles—as total figures furnish no indication of the quality of the goods. It is on the quality of the goods it can produce that the efficiency of the industry depends.

A.—Available official information regarding the production of rubber goods in certain countries:—

I.—GREAT BRITAIN.

1. The following table shows the particulars regarding rubber tyres that were ascertained in connexion with the Census of Production for 1924; later particulars are not available:—

Kinds of Tyre.	Number.	Output, 1924.
		Value at Factory. £
Rubber Tyres and Tubes, Pneumatic:		
Outer Covers:		
Motor Car	1,927,100	4,913,000
Motor Cycle	632,100	616,000
Cycle	5,509,800	1,231,000
Inner Tubes	7,237,400	1,218,000
Rubber Tyres, Solid:		
For Mechanically Propelled Vehicles	397,700	2,059,000
For Other Vehicles	—	306,000
Not separately distinguished ...	—	39,000
Total		10,382,000

CANADA.

2. Particulars are given below of the production of various kinds of tyres in the years 1924 to 1928:—

Kinds of Tyres.	1924.		1925.		1926.		1927.		1928.	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
	Thous.	£	Thous.	£	Thous.	£	Thous.	£	Thous.	£
Pneumatic Tyres:										
Casings... ..	2,139	5,112	2,970	6,904	2,966	7,703	3,856	8,368	4,339	8,443
Inner Tubes	2,454	966	3,462	1,423	3,512	1,632	4,276	1,707	4,638	1,513
Radial Tyres	21	119	21	148	18	164	21	177	17	122
Motor Cycle Tyres:										
Casings... ..	183	56	198	71	176	47	161	36	187	37
Inner Tubes	184	23	208	20	214	27	150	17	208	19
Motor Tyres:										
Casings... ..	48	74	53	69	91	109	38	54	36	42
Inner Tubes	38	11	48	13	64	17	20	6	22	5
Total		6,361		8,648		9,699		10,365		10,181

UNITED STATES.

3. Some indication of the growth of certain branches of the rubber manufacturing industry is given in the following table which has been extracted from the "Surveys of Current Business" issued by the United States Department of Commerce and which cover about seventy-five per cent. of the industries mentioned:—

Kind of Goods	1924.	1925.	1926.	1927.	1928.	1929. (ten months).
	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>
Pneumatic Tyres ...	28,804	45,729	46,277	48,536	58,537	49,838
Inner Tubes ...	53,094	62,047	57,514	52,696	60,175	49,464
Solid and Cushion Tyres	699	783	578	572	513	349
Mechanicals:	£000	£000	£000	£000	£000	£000
Belting ...	2,670	3,762	4,225	3,620	3,460	(a)
Hose ...	4,230	5,100	5,950	5,480	5,240	(a)
Other ...	3,045	4,460	5,580	4,950	5,480	(a)
	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>
	<i>Doz.</i>	<i>Doz.</i>	<i>Doz.</i>	<i>Doz.</i>	<i>Doz.</i>	<i>Doz.</i>
	<i>Pairs.</i>	<i>Pairs.</i>	<i>Pairs.</i>	<i>Pairs.</i>	<i>Pairs.</i>	<i>Pairs.</i>
Rubber Heels ...	15,523	17,248	15,276	16,692	19,596	(a)
" Soles ...	(a)	(a)	1,021	2,264	3,137	(a)
Rubber-proofed fabric:	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>	<i>Thous.</i>
	<i>Yds.</i>	<i>Yds.</i>	<i>Yds.</i>	<i>Yds.</i>	<i>Yds.</i>	<i>Yds.</i>
Automobile ...	11,123	7,879	8,367	9,358	9,091	9,845
Clothing ...	6,308	9,181	14,758	21,996	21,632	(a)
Other ...	7,592	6,923	6,208	6,515	10,746	(a)

(a) Not available.

The output of pneumatic tyres and inner tubes for motor vehicles has substantially increased, but that of solid tyres has decreased since 1925. The output of rubber-proofed fabric for automobiles has remained fairly stationary, but fabric for clothing and other purposes has increased largely. Rubber soles and heels have increased considerably, rubber belting has probably declined somewhat in aggregate value, while rubber hose has remained fairly constant.

The Board of Trade Journal for March 3rd, 1927, contained a Preliminary Report on the output of the Rubber Manufacturing Industry of Great Britain in 1924, from which the following particulars are extracted. Particulars of the corresponding exports and imports are also given:—

Kind of Goods.	Production, 1924.			Exports, 1924.			Retained Imports, 1924.		
	Quantity.	Value.	Percentage of Total Value.	Quantity.	Value.	Percentage of Production.	Quantity.	Value.	Percentage of Production.
<i>Rubber Trades:—</i>	No.	£'000.		No.	£'000.		No.	£'000.	
Pneumatic Tyres & Tubes:									
Outer Covers:									
Motor Car	1,927,100	4,913	22·89	550,245	1,379	28·6	842,820	1,803	43·7
Motor Cycle	632,100	616	2·87	160,683	177	25·4	19,787	21	3·1
Cycle	5,509,800	1,231	5·73	1,622,868	422	29·5	724,099	89	13·1
Inner Tubes	7,237,400	1,218	5·67	1,935,270	400	26·8	2,039,053	370	23·2
Rubber Tyres, Solid ...	397,700	2,404	11·20	77,084	351	19·4	71,921	289	18·1
Boots and Shoes	904,900 doz. prs.	1,255	5·85	259,409 doz. prs.	412	28·7	225,446 doz. prs.	517	24·9
Heels and Soles	3,600 tons	808	3·76	262 tons	121	7·3	93 tons	15	2·6
Piping and Tubing: Hose...	5,258,000 yards	720	3·35						
Piping and Tubing:				672 tons	187	11·0 (c)	485 tons	91	8·0 (c)
Mechanicals	3,600 tons	1,043	4·86						
Machinery Belting	1,485 tons	568	2·65	(b)	(b)	(b)	(b)	(b)	(b)
Overcoats, etc., Rubber-proofed.	1,907,500	1,610	7·50	(d)	(d)	(d)	(d)	(d)	(d)
Sports Requisites		1,056	4·92		510			88	
Toys		45	0·21		22			84	
Hot Water, Medical, etc., Goods.		566	2·64						
Vulcanite and Ebonite ...		736	3·43		1,789			907	
Rubber Compounds and Solutions.	1,130 tons	136	0·64						
Rubber Sheet, Threads, etc.	3,700 tons	907	0·63 (a)	564 tons	307		275 tons	137	
Total carried forward ...		19,832			6,077			4,411	

Kind of Goods.	Production, 1924.			Exports, 1924.			Retained Imports, 1924.		
	Quantity.	Value.	Percentage of Total Value.	Quantity.	Value.	Percentage of Production.	Quantity.	Value.	Percentage of Production.
Total brought forward...		19,832			6,077			4,411	
<i>Clothing Trades</i> :— Overcoats, etc., Rubber-proofed.		1,606	7.48	966,020	955	27.5	6,588	7	0.2
<i>Games and Toys Trades</i> ...		800	3.72			(f)			(f)
Total		22,238			7,032			4,418	
Less Rubber Sheet, etc., Duplicated.	3,136 tons	769							
Total		21,469	100.00		7,032			4,418	

(a) Free of duplication.

(b) Not shown separately, not included in Rubber Trades totals.

(c) Estimated.

(d) See below.

(e) By value.

(f) See above.

Production in the United States.

From the published statistics of the Census of Manufactures, 1927.

Rubber Manufactured Goods.	Production.		Exports.		Percentage of Production.
	Quantity.	Value.	Quantity.	Value.	
	Number.	£000.	Number.	£000.	(By value.)
Pneumatic Tyres :—					
Outer Covers : for Motor Cars	63,549,949	130,370	2,630,540	6,950	5·30
for Motor Cycles and Cycles.	434,712	239			
Inner Tubes : for Motor Cars	70,855,455	21,700	1,630,921	720	3·32
for Motor Cycles and Cycles.	351,367	43			
Single tube tyres	2,260,181	479	61,032	36	6·64
Other covers and tubes	—	23			
Solid and Cushion tyres :—					
for Motor vehicles... ..	812,548	7,200	97,001	595	8·30
for other vehicles	—	344	—	90	26·40
Boots and Shoes	Doz. pairs.	27,406	Doz. pairs.	1,454	5·36
Heels and Soles... ..	8,812,356	7,175	631,177	310	4·32
	28,263,869		—		
	Tons.		Tons.		
Machinery Belting	19,369	4,520	2,237	553	12·24
Rubber Hose	—	8,530	—	550	6·46
„ Packing	6,704	1,000	1,079	228	22·80
Washers, gaskets, valves, pump sleeves, liner strips.	5,776	1,590			
Rubber and friction tape	7,593	829	665	88	10·69
Plumbers' rubber goods	—	140			
Rubber-covered rolls	—	445			
Other mechanicals	—	3,510			
Rubberised fabrics :—	Thous. Sq. Yds.				
Motor Car and Carriage	17,363	2,275			
Raincoat fabrics	23,688	2,030			
Hospital sheeting	3,422	379			
Other	11,336	804			
Ruggists' and Stationers' Sundries.	—	3,240	—	320	9·90
Rubber flooring... ..	Thous. Sq. Yds.	975			
	Thou. Galls.	928			
Rubber cement	4,827	800			

*Production in the United States—continued.*From the published statistics of the Census of Manufactures, 1927—*continued.*

Rubber Manufactured Goods.	Production.		Exports.		
	Quantity.	Value.	Quantity.	Value.	Percent- age of Produc- tion.
Tyre sundries and repair materials.	—	£000. 4,990	—	£000. 378	(By value). 7.56
Rubber mats and matting ...	—	1,495	Tons.		
Rubber thread	2,358	1,096	681	392	35.40
	Thous. gross.				
Jar rings	6,769	627			
	Dozens.		Dozens.		
Bathing Caps	740,860	350	157,676	70	20.00
Hard rubber goods	—	3,880	—	143	36.80
Other manufactures of rubber ...	—	8,300	—	485	5.84
	Tons.		Tons.		
Reclaimed rubber for sale as such	147,516	5,625	8,540	361	6.48
TOTAL	—	252,362	—	13,727	5.44

The manufacture of tyres and tubes accounted for 63.6 per cent. of the value of the total output; footwear accounted for 10.9 per cent. and mechanicals for 8.1 per cent. In addition to the manufactures given in the list above, which covers the rubber industry proper, "Waterproof Clothing" was returned in the clothing industry. Rubber was also used in the manufacture of toys and returned in the Toys, games and play-ground equipment report to the value of £1,430,000.

Kind of Goods.	Production.			Exports (year to 31st March, 1927).			Retained Imports (year to 31st March, 1927).		
	Quantity.	Value.	Percentage of Total Value.	Quantity.	Value.	Percentage of Production.	Quantity.	Value.	Percentage of Production.
Pneumatic Tyres and Tubes :	No.	£'000.		No.	£'000.		No.	£'000.	
Outer Covers :									
Motor Car	2,966,088	7,844	44·11 }	1,344,675	3,205	43·98	20,497	58	0·67
Motor Cycle	91,359	109	0·61 }						
Cycle	175,980	47	0·27 }	1,464	(a)	0·83	24,592	3	13·97 (c)
Inner Tubes :									
Motor Car	3,511,897	1,631	9·17 }	1,326,390	551	35·00	23,393	11	0·62
Other	277,983	45	0·25 }						
Solid Tyres	—	208	1·17 }	10,835	70	33·65 (b)	—	8	3·85 (b)
	Doz. prs.			Doz. prs.			Doz. prs.		
Boots and Shoes	1,625,788	5,045	28·37	549,190	1,315	33·78	5,329	24	0·33
Heels and Soles	1,488,848	339	1·91	Not stated.	—	—	28,852	4	1·94 (d)
Rubber Hose	1,942 tons	456	2·56	—	57	12·50 (b)	—	36	7·89 (b)
Rubber Belting	2,009 tons	608	3·42	477 tons	112	23·74	—	42	6·91 (b)
Rubber Clothing—Coats ...	50,695 No.	41	0·23 }	—	5	6·58 (b)	—	59	77·63 (b)
Rubber Clothing—Other... }	—	35	0·20 }	—	—	—	—	—	—
Drug Sundries	—	127	0·71 }	—	—	—	—	—	—
Other Rubber Goods ... }	—	1,247	7·02 }	—	125	7·30 (b)	—	391	28·46 (b)
		17,782	100·00		5,440			636	

(a) Less than £500. (b) By value. (c) Bicycle Tyres and Inner Tubes. (d) Heels only.

The manufacture of tyres and tubes accounts for 55·59 per cent. of the output and footwear for 30·28 per cent. The other classes of goods are all small relatively to the total. Imports are only of importance in rubber clothing and bicycle covers and inner tubes, and to a less extent in hose and belting.

TYRES AND INNER TUBES.

Production in Germany.

Table showing the number of tyres produced in Germany in 1925, 1926, 1927 and 1928, and the domestic sales and exports of the tyres produced in 1928.

Kinds of tyres.	Production.				Sales in 1928.	
	1925.	1926.	1927.	1928.	At home.	Abroad.
Pneumatic tyres for private cars and light delivery vans :						
Outer covers	1,019,517	816,622	1,182,443	1,361,938	1,255,935	153,346
Inner tubes...	1,092,701	756,192	1,170,013	1,303,641	1,145,149	159,792
Tyres for lorries and omnibuses :						
Pneumatic :						
Outer covers	72,599	51,214	75,077	128,481	107,371	24,377
Inner tubes...	75,738	34,883	59,096	120,213	90,661	23,443
Elastic (hollow) tyres with steel bands.	76,060	75,628	95,555	153,549	146,743	6,467
Solid tyres with steel bands.	142,228	66,677	118,043	41,353	47,171	7,782
Tyres for light goods, vehicles and tractors :						
Pneumatic :						
Covers				1,606	1,448	
Tubes	(included under "other tyres")			1,767	1,469	
Solid (with steel bands).	23,498	16,931	40,187	44,788	46,679	
Tyres for motor cycles :						
Outer covers	285,306	241,472	444,197	762,708	721,997	22,375
Inner tubes...	313,114	239,609	437,162	805,904	780,837	25,596
Tyres for pedal cycles :						
Outer covers	10,928,000	9,219,000	16,426,933	11,576,711	11,601,527	1,058,453
Inner tubes...	11,808,000	9,874,000	14,566,551	11,910,746	9,346,544	2,968,454
One-piece tyres.	219,000	134,000	288,340	171,728	180,961	8,859
Other tyres :						
Outer covers ...	5,899	—	5,573	6,295	6,368	
Inner tubes ...	—	—	6,469			

TABLE A.

Total Exports of Rubber Manufactured Goods from the chief exporting Countries.

Country and Class of Goods.	1923.	1924.	1925.	1926.	1927.	1928.
	in thousand £'s.					
<i>United Kingdom—</i>						
Tyres and Tubes	2,180	2,730	4,079	4,524	3,743	3,425
Other Goods	3,971	4,302	4,477	4,155	4,019	4,556
Total	6,151	7,032	8,556	8,679	7,762	7,981
<i>United States—</i>						
Tyres and Tubes	4,363	4,596	5,777	6,497	8,392	7,578
Other Goods	3,845	4,527	4,763	5,499	5,575	6,581
Total	8,208	9,123	10,540	11,996	13,967	14,159
<i>France—</i>						
Tyres and Tubes	1,087	759	1,039	1,190	1,079	1,213
Other Goods	3,122	3,233	3,670	3,541	3,886	4,440
Total	4,209	3,992	4,709	4,731	4,965	5,653
<i>Belgium—</i>						
Tyres and Tubes	7,137	7,431	7,891	6,775	6,520	4,812
Other Goods	1,453	2,125	2,521	2,215	1,192	1,378
Total	8,590	9,556	10,412	8,992	7,712	6,190
<i>Italy—</i>						
Tyres and Tubes	1,550	2,278	3,103	2,778	2,500	2,416
Other Goods	264	263	329	339	349	327
Total	1,814	2,541	3,432	3,117	2,849	2,743
<i>Canada—</i>						
Tyres and Tubes	(c) 1,420	(c) 1,623	(c) 2,886	(c) 3,826	4,215	4,051
Other Goods	576	840	1,296	1,614	1,456	2,204
Total	1,996	2,463	4,182	5,440	5,701	6,255
<i>Japan—</i>						
Tyres and Tubes	390	324	947	474	494	572
Other Goods (a)	167	262	292	235	249	312
Total	557	586	1,239	709	743	884
<i>Germany—</i>						
Tyres and Tubes	—	(b) 35	524	672	967	1,494
Other Goods	—	(b) 16	151	128	149	226
Total	—	(b) 51	675	800	1,116	1,720
<i>Germany—</i>						
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Other Goods	—					

1. EXPORTS OF THE UNITED KINGDOM, 1928.

<i>Commodity.</i>	<i>Value.</i> £
Tyres:	
Pneumatic Outer Covers:	
For motor cars	2,198,479
For motor cycles and tricars	94,127
For cycles	405,626
Inner tubes:	
For motor cars	352,216
For motor cycles and tricars	22,937
For cycles	125,600
Solid tyres:	
For motor cars, etc.	220,446
For other vehicles	5,732
Total (tyres)	<u>3,425,162</u>
	£
Mechanicals:	
Belting (rubber, rubber composition, etc.)	220,991
Piping and tubing of rubber or rubber and other materials... ..	249,199
Footwear:	
Rubber boots and shoes	456,255
Rubber heels and soles	76,040
Miscellaneous:	
Rubber balls:	
Golf balls	332,737
Tennis balls	201,790
Other descriptions	44,131
Rubber gloves	4,881
Rubber mats, matting and tiling	40,585
Rubberproof cloth of which the chief value is rubber, and sheeting of rubber	595,102
Apparel—rubber waterproofed	785,504
Overalls and aprons wholly of rubber	2,410
Vulcanite and ebonite, in rods, tubes, sheets, etc.	34,098
Elastic cords, webs, braids and fabrics	332,217
Sheets, threads, etc., wholly of rubber	503,249
Toys, wholly or mainly of rubber	8,245
Other rubber manufactures, not elsewhere specified	564,029
Total (rubber manufactures other than tyres)	<u>4,556,532</u>
Total (all rubber manufactures)	<u>7,981,694</u>

2. EXPORTS OF CANADA—1928.

	£'000.
Tyres for bicycles—pneumatic tyre casings and inner tubes	1
Tyres—pneumatic casings n.o.p.	3,440
Tyres—inner tubes n.o.p.	536
Tyres—solid rubber	74
Total (tyres)	<u>4,051</u>

2. EXPORTS OF CANADA, 1928—cont.		£'000.
Belting of rubber		97
Canvas shoes with rubber soles		1,047
Boots and shoes of rubber n.o.p.		721
Clothing (rubber) including waterproofed		6
Hoses of rubber		53
All other manufactures of rubber n.o.p. (except tyres)		280
Total		2,204
Grand Total		6,255

3. EXPORTS OF UNITED STATES.		1928.	1929.
		£'000.	£'000.
Rubberised piece goods and hospital sheetings		178	152
Rubber footwear:			
Boots		580	650
Shoes		560	767
Canvas shoes with rubber soles		755	1,025
Rubber water bottles and fountain syringes		47	62
Rubber gloves		56	65
Other Druggists' rubber sundries		88	84
Rubber balloons		154	181
Rubber toys and balls		42	40
Rubber bathing caps		77	80
Hard rubber goods:			
Electrical		68	54
Other		73	90
Tyre sundries and repair material		337	346
Rubber and friction tape		99	105
Rubber belting		572	631
Rubber hose		540	644
Rubber packing		250	244
Rubber soles and heels		392	304
Rubber thread		363	354
Rubber bands and erasers		123	128
Other rubber manufactures		535	660
Total		5,889	6,666
Tyres:			
Automobile casings		6,375	6,900
Automobile inner tubes		725	702
Other casings and tubes		26	121
Solid tyres:			
Automobiles		370	268
Other		82	61
Total tyres and tubes		7,578	8,052
Waterproofed auto-cloth		266	204
Waterproofed outer-garments		160	219
Elastic webbing		266	304
Total Waterproofs and Elastic Webbing		692	727
Grand Total		14,159	15,445

4. EXPORTS OF FRANCE, 1928.

	£'000.
Manufactures of rubber or gutta-percha:	
Sheets of pure rubber not vulcanised and vulcanised rubber threads	36.6
Elastic fabrics	93.7
Fabrics in pieces	159.5
Made up articles of rubbered fabric	19.6
Clothing and made up accessories of clothing	127.2
Hygienic rubber goods...	15.0
Fabric for carding, not cut	62.6
Footwear	431.7
Belting, hose, valves, etc.	431.6
Total	1,377.5
Outer covers, inner tubes, solid tyres	4,812.0
Grand Total	6,189.5

5. EXPORTS OF ITALY—MANUFACTURES OF RUBBER, 1928.

	£
Sheets and plates	8,550
Rubber tubes	22,200
Rubber cords—even combined with textile materials	425
Rubber thread...	54,800
Discs, perforated or not, bands or valves	1,650
Transmission belts, combined with tissue	4,250
Carpets and mats	2,540
Rubbered tissues in the piece	56,500
Elastic trimmings, ribbons, galloons, etc.	100,000
Wearing apparel or travelling requisites of rubbered tissues	6,460
Other manufactures of rubbered tissues...	1,850
Rubber gloves...	278
Cakes or pieces of rubber for erasers, even with wooden sheaths...	1,640
Other rubber manufactures n.e.s.	62,000
Ebonite	3,660
Total	326,803
Rings or bands of rubber for vehicle wheels combined with metal	115,008
Other, also combined with tissues	24,278
Outer covers, inner tubes for wheels, also combined with fabric	2,276,995
Total (Tyres)	2,416,281
Grand Total	2,743,084

6. EXPORTS OF GERMANY, 1928.

	£000.
Rubber solution	27
Soft rubber paste and rolled sheets thereof; cuttings of rubber unmanufactured; rubber sheets with wire rolled in; all the foregoing not vulcanised; regenerated rubber; gutta-percha paper	124
Cut sheets (patent sheets) of rubber, not vulcanised, unmanufactured	20
Rubber thread	178
Rubber tubing (except inner tubes)	366
Driving belts of fabric, coated with rubber	128
Wagon covers, made of coarse fabric coated with rubber	1
Rubber footwear	89
Wares of soft rubber not elsewhere mentioned; floor coverings; rubber sheets combined with fabric; iron rollers coated with rubber	1,832
Piston packing, stuffing box packing, luting cords	40
Fabric with rubber thread; rubber goods with textiles	1,074
Rubber print cloths for factories and card cloth for carding factories	29
Hard rubber paste (not vulcanised) and hardened rubber paste for dental purposes	5
Hardened rubber in sheets, bars; rough pressed goods of hardened rubber, unworked	47
Tubes of hardened rubber, not further worked	6
Other goods of hardened rubber	473
Rubber goods insufficiently declared	1
Total	4,440
Inner tubes for tyres of motor vehicles... ..	92
Inner tubes for tyres of other vehicles (bicycles, etc.)	125
Rubber tyres for wheels of vehicles	165
Outer covers for wheels of motor vehicles (also of leather)... ..	676
Outer covers for cycle wheels (also of leather)... ..	155
Total (Tyres)	1,213
Grand Total	5,653

7. EXPORTS OF BELGO-LUXEMBURG ECONOMIC UNION, 1928.

	£
Rubber solution	235
Rubber in sheets, plates, rods, &c.:	
Ebonite	1,105
Other kinds	29,200
Rubber in sheets with metal or fabric added	1,965
Rubber for dental purposes	1,600
Rubber threads	240
Belting of rubber, gutta-percha, balata or other similar material, even including fabric	31,850
Hose and tubing of rubber	20,900
Valves and washers of rubber	833
Surgical and hygienic goods, including rubber gloves	10,000
Brake blocks of rubber	5,830
Numbers, letters, &c., of rubber, even mounted on wood or metal	264
Cushions, mattresses, pillows and similar pneumatic articles of rubber	264
Toys and games, balls and bladders for games, even covered with skin or fabric	17,200
Handles of penknives, knives and razors	716
Miscellaneous hard-rubber articles—not designated elsewhere ...	1,800
Rubber heels and soles	16,200
Mats and matting	275
Other rubber manufactures not designated elsewhere	49,109
Footwear of rubber:	
Goloshes	3,060
Other*	33,100
	225,796
Tyres:	
Solid tyres	} (Total figure only is avail- able.)
Pneumatic (outer covers) for motors or motor cycles, for other vehicles	
Inner tubes	
Tyres and outer covers and inner tubes for all vehicles ...	
Total (tyres)	1,494,353
Grand Total	1,720,149

* Footwear of canvas, &c., with rubber soles is not included, it is returned under "Footwear, &c., with soles of leather or rubber."

Note.—In the foregoing tables of exports, the year 1928 has been selected as the latest for which details are generally available. The details of exports from the United States in 1929 are available and have accordingly been added.

TABLE C.
Imports of Rubber Tyres.
1.—United Kingdom

Imports from	1924.	1925.	1926.	1927.		Total.	1928.	
				Jan./ 12 April.	13 April/ Dec.			
CANADA.								
er Motors ...	£ 338,995	£ 394,724	£ 462,736	£ 191,028	£ 509,958	£ 700,986	£ 245,630	
ers M. Cycles	6,612	10,366	17,721	8,449	14,779	23,228	14,424	
Cycles ...	*	*	*	*	*	*	*	
er Motors } es M. Cycles } Cycles }	71,089	67,299	53,925	24,155	61,221	85,376	19,275	
			*	*	762	762	642	
			*	*	*	*	*	
l Tyres ...	898	25,266	5,105	1,320	4,225	5,545	822	
Total ...	417,594	497,655	539,487	224,952	590,945	815,897	280,793	
UNITED STATES.								
er Motors ...	607,514	847,933	685,247	361,237	228,058	589,295	167,870	
ers M. Cycles	3,849	6,698	5,315	123	*	123	*	
Cycles ...	*	*	*	*	*	*	*	
er Motors } es M. Cycles } Cycles }	110,682	107,805	88,037	40,433	13,663	54,096	14,437	
			*	*	*	*	*	
			*	*	*	*	*	
l Tyres ...	167,860	114,303	116,361	47,284	13,824	61,108	5,174	
Total ...	889,905	1,076,739	894,960	449,077	225,545	704,622	187,481	
FRANCE.								
er Motors ...	711,094	868,647	1,489,730	644,967	76,699	721,666	61,130	
ers M. Cycles	9,971	4,001	104,963	41,651	19,920	61,571	23,957	
Cycles ...	28,161	75,332	122,209	28,030	23,489	51,519	40,431	
er Motors } es M. Cycles } Cycles }	160,858	205,602	281,780	89,978	8,594	98,572	31,278	
			*	*	3,068	2,083	5,151	2,923
			43,268	5,901	4,467	10,368	8,514	
l Tyres ...	56,977	71,784	57,326	12,834	17,524	30,358	27,518	
Total ...	967,061	1,225,366	2,099,276	826,429	152,776	979,205	195,751	
ITALY.								
er Motors ...	381,334	535,713	625,321	225,770	30,434	256,204	25,945	
ers M. Cycles	*	*	*	*	*	*	*	
Cycles ...	563	4,199	8,200	2,880	*	2,880	*	
er Motors } es M. Cycles } Cycles }	12,055	19,687	17,318	3,114	2,620	5,734	700	
			*	*	*	*	*	
			*	*	*	*	*	
l Tyres ...	50,058	151,214	75,494	20,614	37,366	57,980	55,119	
Total ...	444,010	710,813	726,333	252,378	70,420	322,798	81,764	

* Not specified in United Kingdom Import returns.

1.—United Kingdom—continued.

Imports from	1924.	1925.	1926.	1927.		Total	1928.
				Jan/ 12 April.	13 April/ Dec.		
GERMANY.							
Outer Motors ...	£ 24,111	£ 24,305	£ 100,476	£ 19,314	£ 5,680	£ 24,994	£ 6,293
Covers M. Cycles	2,283	1,193	6,777	953	*	953	*
Cycles ...	24,064	15,052	4,103	3,233	6,379	9,612	10,645
Inner Motors			9,716	*	*	*	*
Tubes M. Cycles	28,385	29,665		*	*	*	*
Cycles			40,644	7,778	15,526	23,304	22,677
Solid Tyres ...	27,291	17,324	34,912	6,669	*	6,669	*
Total ...	106,134	87,539	195,628	37,947	27,585	65,532	39,615
BELGIUM.							
Outer Motors ...	94,976	127,478	207,393	53,451	54,613	108,064	47,858
Covers M. Cycles	1,990	580	779	1,028	8,682	9,710	18,916
Cycles ...	2,743	3,394	3,305	1,947	15,043	16,990	26,204
Inner Motors			24,077	5,954	4,932	10,886	5,617
Tubes M. Cycles	14,050	20,927		*	1,413	1,413	3,109
Cycles			10,394	1,777	8,683	10,460	20,696
Solid Tyres ...	1,677	4,019	6,675	861	*	861	*
Total ...	115,436	156,398	252,553	65,018	93,366	158,384	122,400
TOTAL EMPIRE.							
Outer Motors ...	355,916	405,151	476,782	193,856	512,068	705,924	247,370
Covers M. Cycles	6,966	10,556	17,970	8,480	14,783	23,263	14,740
Cycles ...	2,408	2,652	1,393	156	477	633	648
Inner Motors			55,583	24,402	61,291	85,693	19,428
Tubes M. Cycles	75,247	68,887		1,217	762	1,979	642
Cycles				134	93	227	370
Solid For Mo-	6,288	29,844	7,525	3,531	4,960	8,491	851
Tyres tors, etc.							
For others	37	344	57	10	5	15	24
Total ...	466,862	517,434	559,310	231,786	594,439	826,225	284,073
TOTAL FOREIGN.							
Outer Motors ...	1,839,055	2,418,423	3,130,586	1,306,368	397,060	1,703,428	311,395
Covers M. Cycles	19,700	14,190	121,393	46,109	29,162	75,271	43,098
Cycles ...	93,824	165,684	208,880	51,349	72,117	123,466	120,075
Inner Motors			423,008	141,172	31,203	172,375	53,097
Tubes M. Cycles	331,650	388,952		3,926	3,572	7,498	6,072
Cycles			106,458	19,651	36,098	55,749	64,472
Solid For Mo-	305,948	362,213	296,713	88,583	70,577	159,160	88,008
Tyres tors, etc.							
For others	106	736	2,796	195	1,575	1,770	2,358
Total ...	2,590,283	3,350,198	4,289,834	1,657,353	641,364	2,298,717	688,571

* Not specified in United Kingdom Import returns.

IMPORTS OF RUBBER TYRES.

2.—Australia.

	1925-6.	1926-7.	1927-8.	1925-6.	1926-7.	1927-8.
	lb.	lb.	lb.	£	£	£
Tyre fabric, rubbered—						
Total				940	3,229	407
from Empire ...	Not available			733	2,868	150
from United Kingdom.				733	2,868	104
Tyres, pneumatic—						
<i>Covers—</i>						
Total	8,951,132	7,690,199	5,045,218	2,047,438	1,558,494	801,060
from Empire ...	3,102,907	2,964,360	1,462,439	776,629	679,926	255,113
from United Kingdom.	1,336,261	1,601,589	698,571	355,198	385,332	130,524
<i>Tubes—</i>						
Total	1,299,814	1,015,903	497,993	320,519	223,981	88,251
from Empire ...	589,346	545,547	212,030	151,432	125,027	44,247
from United Kingdom.	317,011	306,852	90,242	75,541	71,352	18,773
Rubber tyres other than pneumatic—			Number			
Total			20,927	313,180	318,882	193,329
from Empire ...	Not available			111,364	116,839	75,784
from United Kingdom.			10,591	107,937	115,939	75,065
All tyres—						
Total				2,682,077	2,104,586	1,083,047
from Empire ...				1,040,158	924,660	375,294
from United Kingdom.				539,409	575,491	224,466
Percentage of total tyre imports from the Empire.	Not available			38·8%	43·9%	34·6%
Percentage of Empire imports from the United Kingdom.				51·9%	62·2%	59·8%

IMPORTS OF RUBBER TYRES.

3. South Africa.

	1925.	1926.	1927.	1928.	1925.	1926.	1927.	1928.
	tons.	tons.	tons.	tons.	£000	£000	£000	£000
Motor Car tyres ...	1,575	1,452	2,935	3,340	492	530	808	799
Motor Car tubes ...	286	246	425	466	86	98	134	128
Motor Cycle tyres ...	33	38	56	59	11	13	19	19
Motor Cycle tubes ...	6	8	15	14	2	4	6	5
Cycle tyres ...	133	144	162	196	43	41	47	54
Cycle tubes ...	45	56	54	64	17	22	23	25
Solid tyres ...	206	195	229	220	26	32	31	28
Total tyres ...	2,284	2,139	3,874	4,359	677	740	1,068	1,058

4. New Zealand.

	Quantity.			Value.		
	1926.	1927.	1928.	1926.	1927.	1928.
	No.	No.	No.	£	£	£
Rubber tyres, covers and tubes.	} not available	}	}	985,786	1,117,287	1,045,596
Total ...				624,850	827,479	841,834
From the Empire ...				283,752	289,612	234,263
From the United Kingdom				70·5%	74·1%	80·5%
Percentage of Imports from the Empire.				40·8%	35·0%	27·8%
Percentage of Empire Imports from the United Kingdom.						

TABLE D.

Imports of Rubber Manufactured Goods into Empire countries, 1928, from the principal manufacturing countries.

1.—United Kingdom.

Commodity.	Imported from					
	Canada.	United States.	France.	Italy.	Germany.	Total.
<i>Tyres and Tubes—</i>	£	£	£	£	£	£
Outer covers for—						
Motor Cars... ..	245,630	167,870	61,130	25,945	6,293	558,765
Motor Cycles and Tricars... ..	14,424	*	23,957	*	*	57,838
Cycles	*	*	40,431	*	10,645	120,723
Inner tubes for—						
Motor Cars... ..	19,275	14,437	31,278	700	*	72,525
Motor Cycles and Tricars... ..	642	*	2,923	*	*	6,714
Cycles	*	*	8,514	*	22,677	64,842
Solid tyres	822	5,174	27,518	55,119	*	91,241
Total tyres and tubes	280,793	187,481	195,751	81,764	39,615	972,648
<i>Mechanicals—</i>						
Belting (rubber, rubber composition, etc.)	9,718	63,390	358	*	*	78,997
Piping and tubing of rubber	*	73,729	*	*	22,898	114,053
<i>Footwear—</i>						
Rubber boots and shoes	702,288	512,980	116,773	*	91,823	1,622,489
Rubber soles and heels	168,443	90,906	*	*	*	266,510
Carried forward						

*Not specified in United Kingdom returns.

Commodity.	Imported from					
	Canada.	United States.	France.	Italy.	Germany.	Total.
Brought forward						
<i>Miscellaneous—</i>						
Rubber Balls—						
Golf Balls	*	*	*	*	*	577
Tennis Balls	*	*	*	*	*	7,325
Other sorts... ..	*	5,933	41,797	*	21,977	91,099
Rubber Gloves	*	16,893	*	*	7,871	25,412
Rubber Mats, Matting and Tiling	*	4,465	*	*	3,550	13,315
Rubberproof cloth of which the chief value is rubber and sheeting of rubber.	*	35,216	4,580	*	3,165	45,283
Apparel—rubber waterproofed	*	*	80,402	*	2,452	107,012
Overalls and aprons wholly of rubber	*	*	*	*	91,491	93,294
Vulcanite and ebonite in rods, tubes, sheets etc.	—	12,940	2,537	*	8,524	47,282
Elastic cords, webs, braids and fabrics	*	101,700	18,482	13,374	90,108	263,801
Sheets, threads, etc., wholly of rubber	*	166,964	19,949	*	5,607	197,258
Toys, wholly or mainly of rubber	*	57,061	13,505	*	24,662	104,726
Other rubber manufactures not elsewhere specified.	8,934	136,638	16,503	3,857	250,951	453,260
Total (other than tyres)	889,383	1,278,815	314,886	17,231	625,079	3,531,693
Grand Total	1,170,176	1,466,296	510,637	98,995	664,694	4,504,341

*Not specified in United Kingdom returns.

Commodity.	Imported from					
	United Kingdom	United States.	France.	Italy.	Germany.	Total.
	£	£	£	£	£	£
Tyres and tubes for bicycles	212	547	1,435	—	—	2,194
Pneumatic rubber tyre covers, n.o.p.	513	46,868	—	—	—	47,388
Tyres inner tubes, n.o.p.	63	10,066	—	—	—	10,129
Tyres—solid, for motors and trucks	—	3,686	—	—	—	3,686
Tyres—solid, n.o.p.	501	3,772	—	—	—	4,395
Total (tyres)	1,289	64,939	1,435	—	—	67,792
Hard rubber, sheets, strips, etc., not further manufactured.	607	6,930	—	—	—	7,590
Hard rubber in tubes for manufacture of fountain pens.	—	3,243	—	—	—	3,243
Rubber thread, not covered	3,565	48,222	—	—	—	51,789
Belting, rubber, for machinery	905	36,919	—	—	—	37,824
Boots and shoes, rubber	4,993	42,093	—	—	—	47,186
Cement, rubber	130	15,637	—	—	—	16,036
Clothing and clothing made waterproof with india rubber.	33,817	76,366	—	—	7,506	118,516
Elastic, including garter elastic	2,140	4,458	—	—	—	6,620
Gloves, rubber	85	3,753	—	—	—	4,025
Golf balls	22,757	1,427	—	—	—	24,184
Heels, rubber	125	19,539	—	—	—	19,676
Hose, rubber	2,560	44,431	—	—	—	46,995
Hot water bottles, rubber	707	5,647	—	—	—	6,420
Mats and matting, rubber	793	24,266	—	—	—	25,240
Packing, rubber... ..	893	11,943	—	—	—	12,899
Manufactures of rubber, n.o.p.	45,768	231,560	3,688	—	14,484	300,510
Cotton fabric, rubberised	2,104	21,739	—	—	—	23,886
Total (other than tyres)	121,949	597,973	3,688	—	21,990	752,839

3.—Imports of Australia.

Fiscal Year, 1927-1928.

Commodity.	Imported from						
	United Kingdom.	Canada.	United States.	France.	Italy.	Germany.	Total.
	£	£	£	£	£	£	£
Tyres, pneumatic	130,524	124,409	322,757	106,528	113,156	439	801,060
Tubes	18,773	25,424	28,666	13,892	440	31	88,251
Tyres, rubber, other than pneumatic ...	75,065	719	98,677	18,162	—	453	193,329
Total (tyres)	224,362	150,552	450,100	138,580	113,596	923	1,082,640
Belting, rubber	2,084	2,934	9,747	—	—	—	14,766
Goloshes and rubber sand boots and shoes	11,758	32,909	9,603	—	—	584	55,925
Dental cements; dental rubber im- pression trays.	13,424	—	3,148	—	—	81	17,943
Boot and apparel elastic—rubber thread	147,774	159	114,472	1,228	470	30,651	314,328
Floor coverings and floor and carriage mats of rubber.	2,617	323	6,556	23	66	511	10,332
Hard rubber in sheets	2,123	—	1,427	—	—	470	14,994
Hose, rubber, for gardens	10,405	114	22,178	—	—	—	33,121
Syringes, enemas and other surgical rubber goods.	13,115	1,755	4,905	—	—	2,112	22,236
Tyre fabric, rubbered	104	46	246	11	—	—	407
Miscellaneous rubber articles, n.e.i. ...	120,393	3,054	130,878	3,003	290	19,158	283,724
Total (other than tyres)	323,797	41,294	303,160	4,265	826	53,567	767,776

4. Imports of the Union of South Africa, 1928.

Commodity.	Imported from						
	United Kingdom.	Canada.	United States.	France.	Italy.	Germany.	Total.
	£	£	£	£	£	£	£
Pneumatic tyres and tubes	210,179	275,197	230,867	17,661	37,661	212	798,811
Motor car tubes	42,582	43,882	30,305	6,258	12	31	127,756
Motor cycle tyres	15,069	1,984	231	1,466	—	—	18,751
Motor cycle tubes	3,187	1,310	2	397	—	—	4,962
Bicycle tyres	45,610	—	2	5,696	—	249	53,805
Bicycle tubes	21,819	—	—	1,339	—	704	25,288
Solid tyres	17,952	2,253	6,812	65	—	884	27,971
Total (tyres)	356,398	324,626	268,219	32,882	37,673	2,080	1,057,144
Waterproof cloth and sheeting	5,562	45	133	—	—	44	5,806
Hose, rubber	42,176	6,925	35,494	272	16	259	85,405
Heels, soles and tips	4,204	306	11,371	—	—	340	16,772
Tubing, rubber	432	—	194	—	6	65	697
Miscellaneous rubber manufactures	85,857	4,569	28,615	1,804	53	4,893	127,086
Total (other than tyres)	138,231	11,845	75,807	2,076	75	5,601	235,766

5. Imports of New Zealand.

Commodity.	Imported from						
	United Kingdom.	Canada.	United States.	France.	Italy.	Germany.	Total.
Rubber tyres, covers and tubes for bicycles and tricycles.	£ 32,358	£ 1,452	£ 162	£ 4,204	—	£ 1,063	£ 50,822
Rubber tyres, covers and tubes for motors and motor cycles.	201,905	595,385	77,905	110,101	4,165	2,106	994,774
Total (tyres)	234,263	596,837	78,067	114,305	4,165	3,169	1,045,596
Materials for repair of tyres and repair out-fits.	2,895	1,484	8,069	153	—	398	13,514
Gum boots	4,194	66,407	15,307	—	—	—	86,750
Rubber or canvas and rubber, boots, goloshes.	17,093	96,555	2,995	—	—	348	118,060
Rubber heels, soles and knobs	6,534	4,214	658	—	—	107	12,014
Hose, tubing, and piping of rubber ...	14,303	17,939	8,613	—	—	205	54,411
Indiarubber in sheets	1,597	121	1,120	—	—	1,124	9,187
Hot-water bags and bottles	7,109	435	189	—	—	684	8,474
Rubber and gutta-percha solutions and cements.	783	1,299	1,513	66	—	56	5,104
Belting—rubber or textile... ..	20,881	19,584	6,322	54	—	57	49,534
Miscellaneous rubber manufactures n.e.i.	5,757	1,510	3,394	74	—	817	17,560
Total (other than tyres)	81,146	209,548	48,180	347	—	3,796	374,608
Imports from Australia							
Tyres	10,691						
Other	29,482						

6.—Imports of India.

Fiscal year ended 31st March, 1928.

Commodity.	Imported from						
	United Kingdom.	Canada.	United States.	France.	Italy.	Germany.	Total.
	£	£	£	£	£	£	£
Pneumatic motor covers	356,692	271,033	363,573	170,909	67,061	33,720	1,269,599
Pneumatic motor tubes	93,912	48,888	45,054	44,337	954	6,843	240,729
Pneumatic motor cycle covers	8,690	1,300	1,107	1,492	—	210	12,947
Pneumatic motor cycle tubes	3,339	849	2,243	486	—	60	6,980
Pneumatic cycle covers	53,884	—	—	33,223	4,371	1,033	92,746
Pneumatic cycle tubes	40,253	—	—	25,656	840	5,052	72,856
Solid rubber tyres	49,616	11,572	32,596	495	1,411	13,092	110,273
Total (tyres)	606,395	333,642	444,573	276,598	74,637	60,010	1,806,130

No details of imports of other rubber manufactures are given in the Indian trade returns.

APPENDIX V.

LEADING CANADIAN RUBBER MANUFACTURING COMPANIES.

Canadian Goodrich Company, Limited, Kitchener, Ontario.

This company was originally incorporated in 1919 as the Ames Holden Tire Company, Limited. A new factory was erected and modern machinery installed at a reported cost of approximately £260,000. The Company was reorganised in January, 1923, as the Ames Holden Tire and Rubber Company, Limited, at which time The B.F. Goodrich Company of Akron, Ohio, U.S.A., acquired a minority interest. Early in 1925, the Goodrich Company obtained a controlling interest in the stock and the Company's name was changed to Canadian Goodrich Company, Limited.

Additions have been made to the factory since it was constructed, and late in 1928 additional construction work was started. The machinery and plant is up-to-date.

The Company manufactures tyres, including the "Silvertown Cord"; and the "Hi-Press" line of footwear, including Goodrich "Zippers." These products are well known throughout the United States and Canada, and in the latter country enjoy the advantage of the large amount of advertising done by the United States Company in American publications.

The Company maintains branches or warehouses in Halifax and Sydney, Nova Scotia; St. John; Montreal, Ottawa, Toronto, Hamilton, London, Windsor, Port Arthur, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, and Vancouver.

Canadian I.T.S. Rubber Company, Limited, West Toronto, Ontario.

This Company was incorporated in December, 1919, with an authorised capital of £124,000 and has had a steady substantial growth. It employs 225,000, occupies floor space of 100,000 square feet and manufactures heels and soles, bands and erasers, drug sundries, play balls, hard rubber battery boxes and hard rubber toilet seats. It maintains branches in Vancouver, Winnipeg and Montreal, and does a considerable export trade. It was organised by and is managed by Canadians, but the majority of its capital is owned in the United States. It has a connection with the I.T.S. Company, Elyria, Ohio, U.S.A., minority of its shares being held by shareholders of the latter Company.

The Columbus Rubber Co. of Montreal, Limited, Montreal.

The company was incorporated in March, 1912, with an authorised capital of £82,000. The president holds a similar office in the Dominion Rubber Company, Limited, and other officers are prominently connected with the same concern, of which it may be regarded as a subsidiary. The Columbus Rubber Company controls a leading connection throughout Montreal and the Province of Quebec, and maintains branch offices at Ottawa, Toronto, Winnipeg, Calgary, and Regina.

Dominion Rubber Company, Limited, Montreal (formerly Canadian Consolidated Rubber Company, Limited).

The Dominion Rubber Company has its head offices at Montreal and five branch factories. The United States Rubber Company owns a large interest in the Dominion Rubber Company, Limited.

Dunlop Tire and Rubber Goods Company, Limited, Toronto.

From 1894 to 1899, the Dunlop Tire and Rubber Goods Company operated in Canada under the title of The American Dunlop Tire Company, being a branch of the American Dunlop Tire Company, of Belleville, which was controlled by The Dunlop Rubber Company, of Great Britain.

In 1899 Canadian capitalists purchased from the Dunlop Company of Great Britain, all its interest in the American Dunlop Tire Company, and on 1st March of that year a new Canadian Company was formed—the present Dunlop Tire and Rubber Goods Company.

In 1917 the control, which lay in the common stock of the Company was acquired by The Tyre Investment Trust, of London, England, which it was expected would consolidate all the Dunlop Rubber Companies of the world. This amalgamation, however, was not accomplished at that time.

The present development is that the Dunlop Rubber Company, of Great Britain, has secured control of the Tyre Investment Trust, and by so doing, has secured a majority interest in the common stock of the Canadian Company, as well as complete control of the Dunlop (Far East) Company (Japan). With the acquisition of these two companies, and a controlling interest in the Australian Dunlop Company, which was negotiated last year, the Dunlop Rubber Company, of Great Britain, now has an organisation, controlling all "Dunlop" products, which covers the entire globe, with a capital of approximately £40,000,000.

The Canadian Dunlop Company is affected to the extent that it has now the active co-operation of the British Company and of each of its subsidiaries throughout the world, whereas formerly it was assisted only through an interchange of formulae and factory practice.

Firestone Tire and Rubber Company of Canada, Limited, Hamilton, Ontario.

This Company was incorporated under Dominion Charter in November, 1919, with an authorised capital of £1,030,000; Outstanding £620,000; Funded Debt First Mortgage Gold Bonds £168,000.

The Company is a subsidiary of Firestone Tire and Rubber Company of Akron, Ohio, U.S.A., and was established to take care of Canadian trade and to take advantage of the British preferential tariff.

The factory has recently been enlarged and is said to have a capacity of about 6,000 tyres per day. At present it is said to be turning out from 4,500 to 5,000 cases and a similar number of tubes daily.

Gutta Percha and Rubber, Limited, Toronto.

Incorporated in December, 1912, in the Dominion of Canada. Organised for the purpose of taking over the assets of the Gutta Percha and Rubber Manufacturing Company of Toronto, Limited, which was incorporated in 1887, and also the assets of the Winnipeg Rubber Company, Limited, the Vancouver Rubber Company, Limited, and the Toronto Rubber Company, Limited, subsidiary Companies of the Gutta Percha and Rubber Manufacturing Company of Toronto, Limited. Original factory was built in 1883, and business started as a Branch of the Gutta Percha and Rubber Manufacturing Company of New York which, in 1887, was reorganised into a Canadian Company of The Gutta Percha and Rubber Manufacturing Company of Toronto, Limited, with the controlling interest owned in Canada. Shortly thereafter those interests bought the remaining American shareholdings. The entire capital stock has been owned by Canadians living in Canada for over a quarter of a century.

By 1912 the business had outgrown its original capital structure. It was then reorganised and recapitalised as Gutta Percha and Rubber, Limited, its present title. The Head Office and Factories are located in Toronto. It has Branches from coast to coast and a subsidiary company in England—Gutta Percha and Rubber (London), Limited. It is the largest Canadian Rubber Manufacturing Company controlled in Canada.

Subsidiaries: Gutta Percha and Rubber (London), Limited, England.

The Company has branches in Halifax, St. John, Montreal, Ottawa, Toronto, Hamilton, London, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Vancouver and Victoria. It also has export selling

agencies in over 30 different countries, including Australia, New Zealand, Fiji Islands, India, Burma, Federated Malay States, Straits Settlements, South Africa, Rhodesia, Kenya, British West Indies, Jamaica, British Guiana, British Honduras, Newfoundland and Great Britain.

Its factories are at Toronto, and it produces a number of lines, including Rubber Footwear, Canvas Rubber Soled Footwear, Rubber Heels and Soles, Rubber Conveyor and Transmission Belting, Rubber Hose, Cotton Rubber Lined Hose, Rubber Packing, General Mechanical Rubber Goods, etc., Automobile Tyres, Tubes, Accessories, etc.

Capital Stock authorised: Preferred, £412,000; Common, £826,000.
Total, £1,238,000.

The Goodyear Tire and Rubber Company of Canada, Limited, Toronto.

This Company was incorporated in Ontario, 30th March, 1927, as successor to a company of the same name incorporated in Ontario, 2nd December, 1919, which also was successor to a company of the same name incorporated in 1910 under the Dominion Companies Act, by interests connected with the Goodyear Tire and Rubber Company of Akron, Ohio, U.S.A. Through its affiliation with that concern, this Company has the benefits of patents, compounds, research departments, laboratories, etc.

The company manufactures automobile tyres, both pneumatic and solid, also tyres for motor-trucks and motor-cycles. It also manufactures hose, belting, packing, tubes, plumbers' supply, moulded goods, rubber heels and soles and other rubber products.

The company has two plants—one in New Toronto having a floor space of 25.86 acres and the other in Bowmanville having a floor space of about four acres. Both plants are of brick construction, and include Power Houses. All the power is purchased from the Hydro-Electric Power Commission.

The company is the largest manufacturer of rubber goods in the Dominion of Canada, and employs 3,000 workpeople.

In addition the company has branches in Halifax, St. John, Quebec, Montreal, Ottawa, Hamilton, London, Fort William, Winnipeg, Regina, Saskatoon, Edmonton, Calgary and Vancouver.

In April, 1926, the Goodyear Cotton Co. of Canada, Ltd., a subsidiary, acquired the business and assets of Canadian Manhasset Cotton Co. of Canada, Ltd., at St. Hyacinthe, Que. The Goodyear Cotton Co. of Canada, Ltd., manufactures cotton fabrics and cotton ducks used in the manufacture of tyres and rubber goods. The plant, with 20,000 spindles, is located on eight acres of land at St. Hyacinthe, Que., and has a floor space of 3.89 acres and employs 420 workpeople.

All the common stock of Goodyear Cotton Co. of Canada, Ltd., is held by the Goodyear Tire and Rubber Company of Canada, Ltd.

Gregory Tire and Rubber, 1926, Limited, Vancouver.

Gregory Tire and Rubber, 1926, Ltd., Port Coquitlam, B.C. This company operated under a British Columbia Charter obtained in April, 1926, in succession to the Gregory Tire and Rubber Co., incorporated in 1919, with an authorised capital of £309,000. It is not affiliated with any United States organisation. The ownership and capital is entirely Canadian, the assets of the original company having been purchased by a syndicate of Vancouver and New Westminster, men, to whom the new charter was granted.

Since the reorganisation, the company has made excellent progress and has established not only a broad distribution of its products in the domestic market, but has secured export markets in New Zealand, West Indies, British Honduras and the Fijis.

Kaufman Rubber Company, Limited, Kitchener.

The present company, with a Dominion Charter, was incorporated in 1915, with an authorised capital stock of £412,000. The original factory was erected in 1908, and additions have been made from time to time. The factory buildings are six storeys high, and the company claims to be the largest exclusive rubber footwear manufacturer in the British Empire. Branch warehouses are conducted at Charlottetown, P.E.I.; Truro, N.S.; St. John, N.B.; Quebec, Montreal, Ottawa, Toronto, Hamilton, London; Winnipeg, Regina, Saskatoon, Edmonton, Lethbridge, Alberta and Vancouver.

The exclusive manufacturing company for the above Sales Company is the Kaufman Rubber Company (Ontario), Ltd., with an Ontario Charter and an authorised capital stock of £1,030,000. All of the stock of both companies is held privately, and neither company is affiliated with or controlled by any outside interests.

Miner Rubber Company, Limited, Granby, Quebec.

It is understood that the paid-up capital of the company is £185,000. A speciality is made of the manufacture of high-grade rubber footwear, as well as rubber heels, and some other lines. Branches are maintained at Halifax, Montreal, Quebec, Ottawa, London and North Bay, Winnipeg, Regina, Edmonton, Calgary and Vancouver. The main administrative offices are in Granby, Que. (also factory). Entirely controlled in Canada.

Northern Rubber Company, Limited, Guelph.

This company was incorporated in January, 1919, as the Premier Rubber Company, Ltd., with an authorised capital of £103,000. Subsequently, the name was changed and the authorised capital increased to £260,000. The factory is a large three-storey concrete structure, erected in 1919, and is equipped with up-to-date plant and machinery. The company manufactures all lines of rubber footwear, including goloshes, tennis shoes, etc., and maintains branch warehouses at St. John, Montreal, Ottawa, Winnipeg, Calgary, Vancouver, Edmonton, Sydney and Quebec. All stock held and owned by Canadian citizens.

Sterling Rubber Company, Limited, Guelph.

The company was incorporated in 1912, with an authorised capital of £8,250, as a Provincial organisation. This has since been increased to £31,000 under a Canadian Federal Charter. It manufactures Seamless Rubber Goods only, such as Surgeons' Gloves, Household Gloves, Nurses' Gloves, Electricians' Gloves, Acid Gloves, Meteorological Balloons and various other specialities of Seamless Rubber.

In 1928 their exports represented 35 per cent. of their total production. They have direct representatives in England, Australia, New Zealand, South Africa, Egypt, British West Indies, British and Dutch Guiana, Argentine Republic, China, Italy, Holland, Mexico, Belgium, Sweden and India.

The company is owned and controlled by Canadians and has no connection with any other concern either in Canada nor in any other country, and has built up its business independent of any outside influence.

Joseph Stokes Rubber Company, Limited, Welland.

This company was incorporated in 1920 with an authorised capital of £26,000. The business is regarded as a branch of the Joseph Stokes Rubber Company, Trenton, N.J., the officers and directors of that company being identical with those of the Welland concern. The directors are also large

stockholders in the Home Rubber Company and the Thermoid Rubber Company, both of Trenton, N.J. It is fully equipped and engaged principally in the manufacture of Hard Rubber or Vulcanite products, particularly containers used in the manufacture of Electric Storage Batteries. It is also extensively engaged in the production of moulded goods to specifications of Soft Rubber, Compositions and Bakelite. The works are modern and well equipped.

The Woodstock Rubber Company, Limited, Woodstock.

The date of incorporation was 2nd July, 1926. Authorised capital, £51,500. Number of employees, 300. They manufacture rubber footwear only. This company is not affiliated with any other firm.

APPENDIX VI.

Information regarding money wages and hours of work in the rubber manufacturing industry in some of the principal producing countries. The purchasing power of money wages naturally varies in different countries, depending upon the habits of the different peoples.

United Kingdom.—There are about 60,000 workpeople employed in some 121 factories. The average weekly wage for an adult male is £2 10s. The average for men engaged in the manufacture of tyres, rims and wheels is £3 11s. a week.

Canada.—There are 17,000 people in 45 factories. The average wage for operatives (as opposed to salaried employees) is \$1,026 a year or about £4 a week. About 45 per cent. of the wage earners, of whom the majority are female, are employed in the manufacture of footwear.

Average weekly salaries and wages:—

	<i>Salaries.</i>	<i>Wages.</i>
	£ s. d.	£ s. d.
1. In the footwear industry	5 17 1	3 3 11
2. Other rubber goods factories	7 9 4	4 9 9

United States.—The following details were collected in the Census of Production relating to 1927:—

For the	Wages.	Wage- earners.	Average Weekly wage.
	£000.		£ s. d.
Industry as a whole	40,700	141,997	5 10 3
Tyre and tube industry	24,650	78,256	6 1 2
Boot and shoe industry	6,600	26,848	4 14 6
Other rubber manufactures	9,420	36,893	4 18 2

Hours are a nominal 48-hour week.

France.—The total number of workers is estimated at not less than 40,000. The French Government in the preamble to a bill for general revision of the tariff in March, 1927, put the figure at 50 to 60,000. Wages are understood to be in the neighbourhood of 25s. to 30s. for a week of 52/56 hours.

Italy.—Six firms employ some 16,000 people in the aggregate. The average wage is about 30s. for a week of 48 hours for men.

Average weekly wages:—

Men 135-140 lire.

Women 50 lire.

Boys and girls 50-55 lire.

Germany.—There are some 400 factories employing 25-30,000 people. Average weekly wage for men in 1923 was 41 RM—£2 0s. 5½d.

APPENDIX VII.

RESEARCH ORGANISATIONS DEALING WITH RUBBER.

Europe.—Research Association of British Rubber Manufacturers, 105, Lansdowne Road, Croydon. Supported by the trade, supplemented by temporary Government grant on diminishing scale.

Government Institute for advising the Rubber Trade and the Rubber Industry, Delft, Holland. Supported by Government.

Austrian Rubber Research Institute, 32, Rafaelgasse, Vienna. Supported by leading members of the Rubber Industry.

Rubber Research Laboratory, Poland. Supported by Government.

Staatliches Materialprüfungsamt, Berlin-Dahlem, Germany. State-supported, not confined to rubber.

Asia.—Rubber Research Institute of Malaya, Inc., Kuala Lumpur, F.M.S. Financed by contributions from the Governments of the Straits Settlements and the Federated Malay States on the basis of an equivalent of a cess of 10 cents a pikul on the exports of locally produced rubber.

Rubber Research Scheme (Ceylon), Peradeniya. Supported by a Government grant (about 76,500 rupees) and subscriptions of members (about 33,000 rupees). Adoption of maintenance by a cess on rubber exports is under consideration.

Four research stations in Java dealing with rubber are maintained by the Algemeen Landbouw Syndicaat, or general Planters' Association, entirely by private subscription and voluntary levies:—

(1) The Rubber Research Institute at Buitenzorg.

(2) The Besoeeki Testing Station, Djember, East Java, for tobacco, rubber and coffee.

(3) A small general Testing Station at Salatiga, Central Java.

(4) Testing Station, Malang (rubber, coffee and other cultures).

A.V.R.O.S. General Experimental Station, Medan, Sumatra, supported by private subscriptions.

United Planters' Association of Southern India, Madras. Supported by private subscriptions and a Government grant. In addition to rubber, it covers coffee, tea and other cultures.

America.—U.S. Bureau of Standards, Washington, D.C. State supported.

American Society of Testing Materials, Philadelphia, U.S.A. Supported by subscriptions of members.

Mellon Institute of Industrial Research, Pittsburgh, U.S.A. The Institute is part of the University of Pittsburgh. Supported by endowment and grants and gifts from industry. (Not now working on rubber.)

Physical Testing Committee of Division of Rubber Chemistry of the American Chemical Society. University of Akron, Akron, Ohio, U.S.A. Supported by subscriptions of members and trade.

This list does not include laboratories maintained by rubber companies.

The Rubber Association of America, Inc., set aside a substantial sum for rubber research, and the University of Akron has a well-equipped rubber laboratory.

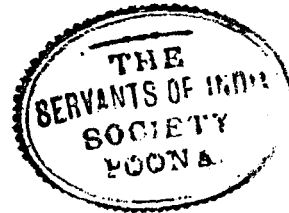
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REPORTS OF THE IMPERIAL ECONOMIC COMMITTEE

SEVENTEENTH REPORT

PROGRESS REPORT—1930



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NOTE.—The cost of the Committee's enquiries up to the 30th June, 1930, has been £12,530 11s. 3d. It has prepared 17 reports (including the present volume). In addition, the cost of printing and publishing this report is estimated by the Stationery Office to be £19 15s. 0d.

PROGRESS REPORT—1930.

SEVENTEENTH REPORT

- To the Right Honourable J. RAMSAY MACDONALD,
Prime Minister and First Lord of the Treasury.
- To the Honourable R. B. BENNETT,
Prime Minister of the Dominion of Canada.
- To the Right Honourable J. H. SCULLIN,
Prime Minister of the Commonwealth of Australia.
- To the Honourable G. W. FORBES,
Prime Minister of the Dominion of New Zealand.
- To General the Honourable J. B. M. HERTZOG,
Prime Minister of the Union of South Africa.
- To WILLIAM T. COSGRAVE, Esq.,
President of the Executive Council, Irish Free State.
- To the Honourable Sir RICHARD A. SQUIRES, K.C.M.G.,
Prime Minister of Newfoundland.
- To the Honourable H. U. MOFFATT, C.M.G.,
Premier of Southern Rhodesia.
- To the Right Honourable W. WEDGWOOD BENN, D.S.O., D.F.C.,
Secretary of State for India.
- To the Right Honourable Lord PASSFIELD,
Secretary of State for the Colonies.
-

PROGRESS REPORT—1930.

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REPORT.

We, the Imperial Economic Committee, appointed by the Governments of the United Kingdom, the Dominions, India, and the Colonies and Protectorates, beg leave to present, for the information of the Governments of the Empire, a Report recording the progress of the work entrusted to the Committee, and reviewing the chief conclusions which have emerged from the particular enquiries conducted by us.

I.—TERMS OF REFERENCE.

1. The Committee assembled in March, 1925. At that time, the terms of reference were—

Original
Terms—
1925.

“ to consider the possibility of improving the methods of preparing for market and marketing within the United Kingdom the food products of the overseas parts of the Empire with a view to increasing the consumption of such products in the United Kingdom in preference to imports from foreign countries, and to promote the interests both of the producers and consumers.”

It was made clear to the Committee that their enquiries should also cover production in the United Kingdom.

2. The Imperial Conference of 1926 endorsed the work so far done by the Imperial Economic Committee, and, in continuing its work to the next Conference, expressed the following view as to the extension of its operations :—

Imperial
Conference
—1926.

“ The Imperial Conference is of opinion that the Imperial Economic Committee should continue on its present *ad hoc* basis with the following general reference :—

(1) to complete the series of investigations into the marketing of Empire food stuffs in Great Britain, and while this work is proceeding

(2) to put forward for the consideration of the various Governments concerned

(a) a list of raw materials for possible further marketing enquiries, and

(b) suggestions for the preparation and circulation of brief preliminary surveys as suggested by the economic sub-committee of the Conference, of any branch of Empire trade and marketing, such preliminary surveys, if the Governments concerned so desire, to be followed up by further enquiries.”

II.—REPORTS.

3. Sixteen Reports, which fall into four categories—general, food products, raw materials, and trade surveys—have so far been completed and submitted.

List.

General :

- The Policy of Voluntary Preference (The First Report).
 Functions and Work of the Imperial Economic Committee
 (Eighth).
 A Memorandum on the Trade of the British Empire 1913 and
 1925 to 1928 (Thirteenth).

Food Products.

- Meat (Second).
 Fruit (Third).
 Dairy Produce (Fourth).
 Fish (Fifth).
 Poultry, Eggs and Honey
 (Sixth and Seventh).
 Pigs and Pig Products
 (Twelfth).
 Tobacco (Ninth).

Raw Materials.

- Timber (Tenth).
 Hides and Skins (Sixteenth).
 A list of raw materials
 suitable for enquiry
 (Fifteenth).

Trade Surveys.

- Agricultural Machinery
 (Eleventh).
 Rubber Manufactured Goods
 (Fourteenth).

First
 Report—
 Voluntary
 Preference.

4. The first of these reports laid the foundation of the voluntary preference movement and led to inter-Empire co-operation in agricultural research being put on a broader basis.

The Imperial Economic Conference of 1923 had, in the course of debate, made it clear that the Committee were not to go into questions of tariff preference. Certain other policies were barred by international treaties. The Committee, therefore, explored the possibility of an organised movement for the exercise of voluntary preference for Empire products on the part of consumers in Great Britain. We came to the conclusion that, for the success of this policy, there were three essentials :—

(a) the consumer in the United Kingdom must be able to distinguish Empire goods from foreign goods;

(b) the consumer in the United Kingdom must also be educated to appreciate the economic advantages of buying within the Empire;

(c) the Empire producer, whether in the United Kingdom or Overseas, must be led to realise that his products must at least equal those of his foreign competitor in quality, quantity and continuity of supply.

—Empire
 Marketing
 Board.

5. In addition to the general reference from the Governments of the Empire, the Committee had been asked to advise the Government of the United Kingdom in regard to the expenditure of the sum of one million pounds a year which it was proposed that the British exchequer should devote to the promotion of inter-Imperial trade. The Prime Minister (Mr. Baldwin) expressed the hope, on 17th December, 1924, in the House of Commons, that with the

annual grant in question it might "be possible to open up entirely new and untried ways of developing trade with the Empire." The Committee decided that, since it was necessary that there should be a persistent driving force behind the movement for voluntary preference if that movement were to succeed, they would recommend that a portion of this money should be spent on publicity for the education and guidance of public opinion. A difficulty arose, however, because the Committee as an Imperial body was limited to advisory functions. The money to be spent was the money of the United Kingdom tax payer and must, constitutionally, be spent under the responsibility of some Minister in Parliament at Westminster. It was, therefore, decided to advise that an executive body should be set up—a United Kingdom authority, as distinguished from the Imperial Economic Committee itself which "derives authority from and reports to all the Governments of the Empire." His Majesty's Ministers in Great Britain accepted this recommendation and set up the Empire Marketing Board.

6. In their first report, the Committee also recognised that not only must there be help for the consumer in the way of marking of goods at time of sale to enable him to exercise his preference, and publicity to induce him to exercise it, but also that there was wide scope for research to help the producers of the Empire in their efforts to cope with the new demand which it was hoped to build up. If there were to be deepening of effort and if useless duplication were to be avoided, it was obvious that not only should there be funds available, but also a "unification and tradition in research and practice throughout the Empire." It was, therefore, recommended that a portion of the money assigned to the Empire Marketing Board should be devoted to the promotion of research, and, also, that there should be a correlation of the agencies of research so that one portion of the Empire might help another.

—Co-operation in Research.

In 1927 a conference of those engaged in agricultural research in all parts of the Empire was held in London at the invitation of the Government of the United Kingdom, and as a result of this conference a system of Imperial Agricultural Bureaux for the collection and dissemination of information on research has been set up. The Secretary of the Imperial Economic Committee has accepted the position of Secretary to the Executive Council controlling this system of Bureaux.

7. The progress of the work of the Empire Marketing Board during the last five years has been the subject of annual reports by that Board. The policy of voluntary preference has grown, and although it is impossible to assess its effects statistically, yet they are apparent, to a greater degree no doubt in some districts than in others. The doctrine of voluntary preference has quickened and defined interest in the Empire which had previously been latent.

The public and voluntary preference.

A great deal, however, remains to be done before the practice becomes general—before, in fact, the fundamental economic argument underlying voluntary preference, that in your own interest you do well to buy from your best customer, becomes, really the actuating motive of the great body of consumers. In putting on record our view of what has so far been achieved, we do not lose sight of the fact that a number of consumers do already give effect to their voluntary preference; and a considerable number of shopkeepers, especially in certain districts, cater for that preference.

Wholesalers. 8. On the whole, whilst this growing consciousness on the part of the public is apparent, there are as yet few signs that the wholesalers have changed their sources of supply to meet it. It is, however, fair to recognise that apart from pressure from the ultimate consumers, the trader, *quâ* trader, has no strong economic motive for breaking away from his old connections. It is for the producer to contribute to this economic motive. We have repeatedly called attention to the necessity in different trades for improvement by producers in the technique of their production and in the organisation of their selling. None the less, we recognise that a few of the wholesalers are actively co-operating in the movement.

Continuous education needed.

9. When recommending the allotment of money by the Empire Marketing Board we said in our first Report that "it may well be that as the movement for Empire buying becomes organised and efficient it will cost less, and that as research develops it will make larger demands." It is, therefore, entirely in harmony with our original designs that the amount of money being spent on research has of late grown larger and is still growing. We would, however, emphasise our view that the educational campaign in favour of Empire buying must not be starved, nor must it be regarded as being merely for the purpose of initiating the movement and, therefore, of a temporary character. Experience in the commercial world has shown conclusively that, even where a great good will has been established in the public mind by wide advertisement, the tide of sales begins to recede very soon if advertisement be abandoned or even seriously reduced. There is always a young generation of new customers coming forward for whose attention many influences are competing.

Notwithstanding the growth of expenditure on research the total expenditure of the Empire Marketing Board is still below the million a year which was to be provided.

The actual expenditure of the Empire Marketing Board has been as follows :—

	£
1926 (nine months)	134,800
1927	403,900
1928	561,500
1929	650,000 (approximate).
1930	800,000 (provision in estimate).

10. Having thus, in our first report, recommended the inauguration of the movement among consumers and the organisation of research, we turned to pass under review, within our terms of reference, the successive branches of Empire trade. In the main, our later reports have been addressed to the producers. The large sum of money which is now being spent in creating a new habit of mind among consumers carries with it obligations on producers to produce foodstuffs of the right quantity, of the right quality, and of the right price. In successive reports we have sought to bring out the dominant facts of the competition between foreign and Empire producers. Our enquiries have been of a practical character, and the results have shown how greatly the various trades differ from one another in their organisation, their requirements, and their defects. As a result, our reports have dealt principally now with this and now with that element in a trade—in some cases, for instance, we addressed ourselves chiefly to the growers, in others to the distributors.

Reports
epitomised.

11. In order to illustrate the foregoing statement as to the variety of trade conditions we think it desirable to present in brief epitome the principal conclusions at which we have arrived. To give some idea of the relative magnitudes of the different trades, we insert, in each case, the value in millions of pounds sterling of the total imports into the United Kingdom in 1929.

12. Our second report dealt with the meat trade (£55 millions). Here we found that whereas the supply of mutton in the United Kingdom market came mainly from within the Empire, that of beef came largely from without. In part, this was due to the fact that it is possible to "chill" beef during the relatively short voyage from the Argentine and not during the relatively long voyage from Australia, and in this matter we made our first specific recommendation for scientific research. But no improvement in the methods of preservation during ocean carriage would suffice unless there were, at the same time, successful, and inevitably somewhat prolonged, efforts to improve the herds of cattle in the appropriate parts of the Empire. We, therefore, recommended that the Empire Marketing Board should assist the carriage of pedigree stock from the United Kingdom to the overseas Empire. An initial difficulty, however, presented itself in the occurrence, at certain times, of cattle disease within the United Kingdom. As a preliminary, therefore, to the carrying out of our recommendation, the Empire Marketing Board have had to provide funds for a system of export quarantine in the ports of the United Kingdom. That system is now effective and it has become possible to give direct assistance to the export of pedigree stock.

Reports of
foodstuffs
—Meat.

—Fruit.

13. In our report on fruit (£48 millions), we had to point out two tendencies which, in our opinion, called for the attention of the Governments as matters for high policy with which we could not deal under the terms of our reference (see paragraph 4). On the one hand, there had been established practically a monopoly in foreign hands in the supply, especially of certain tropical and sub-tropical fruits, to the United Kingdom market, and there was some danger of a rationing with a view to the maintenance of prices. On the other hand, there were certain other fruits, produced in foreign countries with vast home markets, of which the surplus crops in productive years could be thrown into the United Kingdom market with disastrous effects on the stable production of those fruits within the Empire. We, therefore, limited ourselves to recommending that an Empire Intelligence Service should be organised for the purpose of warning producers when seasonal competition was likely to become severe. Such a service has now been established by the Empire Marketing Board in regard to fruit, dairy produce, and pig products—in each case in harmony with our reports on the trade in question.

As an outcome of our recommendations in regard to bananas a direct service of steamers has been established for bringing that fruit from Jamaica to England.

In this report we also made a strong point of the careless packing and unattractive presentation of many lines of Empire produce, as compared with similar foreign products.

—Dairy
Produce.

14. In our report on dairy produce (£74 millions), we dealt especially with the question of orderly marketing and with the control of marketing by producers' organisations. We pointed out the advantages of such control and also the limitations which must be observed in its exercise if consequences disastrous to the producers themselves are not to follow.

In this report we laid special stress on the necessity for uniformity of quality and regularity of supply in order to compete with the highly organised methods adopted by foreign producers.

—Fish.

15. When we came to the report on fish (£13 millions), we had to deal mainly with the United Kingdom industry. The scope for the application of organisation, science and research was at least as striking in this case as in that of production of other food products in the overseas portions of the Empire. In regard both to fish and fruit the cost of distribution within the United Kingdom is such as to call for persistent effort with a view to greater economy.

—Poultry
and Eggs.

16. In our report on poultry and eggs (£25 millions), the question of standards forced itself upon our attention and, therefore, the marking of goods not only in regard to their origin but also in

regard to their quality. The question of standards within the Empire is one to which we refer in a later paragraph.

17. In the report on pigs and pig products (£61 millions), we made a fresh departure. We sent a Sub-Committee of our members to Sweden, Denmark and Holland for the purpose of constructing an authoritative picture of a successful foreign trade with which Empire producers will have to compete in efficiency if they are to win a greater place in the United Kingdom market. As a result of that visit we were able to point out the very definite policies adopted in these Continental countries in regard to breeding, raising and marketing, as contrasted with the relatively haphazard practice followed both in the United Kingdom and in most of the overseas countries of the Empire.

—Pigs and
Pig
Products.

18. In the case of tobacco (£18 millions), a new problem presented itself—that of adjusting the amount of production in overseas parts of the Empire to the gradual growth of the market in the United Kingdom. Losses had followed on a too rapid increase in the production of a tobacco for which the taste of the consumers in the United Kingdom had not been prepared, although the possibility of a gradual education of that taste had been made very evident in recent years by the transfer of custom from Oriental to Virginian tobaccos.

—Tobacco.

19. We have now nearly completed our enquiries into foodstuffs to which our first terms of reference were confined. An enquiry into the marketing of tea, coffee and cocoa is in progress. There remain of major importance only cereals, wine and sugar.

—Enquiries
outstand-
ing.

20. With our enquiry into timber (£46 millions), we entered on a new chapter of our work—the supply of Empire raw materials in the United Kingdom market. For the reasons which we have discussed in our Fifteenth Report voluntary preference is not as a rule applicable to the purchase of raw materials for manufacture. The case of timber, however, is in some degree an exception and presents some similarity to the trades in foodstuffs. Voluntary preference in regard to it can still be exercised, but, partly owing to the slow growth of trees and partly to the relatively considerable undertakings in which timber is for the most part employed, we had to address in this report neither the farmer nor the small consumer, but rather the Governments who control forest policy and the public authorities and great trade corporations who undertake major building operations and have the choice in their hands of the timbers employed.

Reports on
Raw
Materials
—Timber.

21. We shall shortly submit a report on hides and skins (£18 millions), and we have also presented to the Governments a considered list of further raw materials in regard to which it appears to us that enquiries might yield useful results. We have felt it

—Hides
and Skins.
—List.

necessary to call attention therein to the fact that considerations are involved in regard to raw materials which are in large measure of a different order from those to which we have had to pay attention when reporting on foodstuffs. We have, therefore, suggested that we may be allowed to take a wider view than that contemplated in our original terms of reference which were concerned with marketing only in the United Kingdom.

Trade
Surveys.

22. There remain, under the latest addition to our terms of reference, the trade surveys in which we were directed to present the salient features of world industries when regarded from the standpoint of the trade of the British Empire. In these circumstances we were not called upon to make recommendations but, none the less, we have been able to draw attention to certain characteristic features of the trades in question.

—Agricultural
Machinery.

In the case of the agricultural machinery industry in Great Britain, it became evident to us that, for the purpose of export, the amalgamation of small concerns into powerful corporations is, under modern conditions, essential.

—Rubber
goods.

23. In the case of rubber goods, we found that the manufacture of tyres for motor-cars is to-day in the hands of seven vast organisations, which, although they have their control seats in particular countries, are, in fact, each of them, international in the scope of their activities and compete with one another throughout the world. In the case of this trade, the official statistics of imports and exports supplied by the different Governments cease to have much significance unless interpreted by a knowledge, difficult to obtain, of the policies of the different corporations in their competition with one another. A sudden rise or fall in imports or exports in a given country may denote no more than the opening or closing down of a single great factory.

Report on
position of
Empire
in World
Trade.

24. The commerce of the Empire consists of a number of trades, each with its concrete problems which, although in themselves separate and considerable, must be regarded in relation to the whole. Moreover we cannot regard the commerce of the Empire alone. We have become more and more impressed with the necessity of investigating the progress of our foreign competitors no less than that of Empire producers.

For the purpose of orientation, therefore, our secretary lately drew up for us an analysis of world import and export trade, from which certain conclusions were drawn in regard to the part played by the different portions of the British Empire and of the Empire as a whole. We published this statement in our Thirteenth Report.

III.—THREE GENERAL POINTS.

Agricultural
Intelligence.

25. There are three suggestions of a general nature to which we may, perhaps, justifiably call attention as emerging from our

enquiries. In the first place, producers in the different parts of the Empire require information as to what is taking place in their several trades beyond their immediate ken. Early intimation of some of this information, such as seasonal crop prospects, movement of crops, changes in marketing methods, tariffs, export or import regulations, is needed, if it is to be of practical value. In the organised wholesale trades private initiative supplies part at least of this want. But the trade circulars so prepared do not for the most part reach producers and are, moreover, prepared for distribution in particular circles. There are also the various and valuable returns published by both Empire and foreign Governments. But these returns from their very completeness are necessarily as a rule belated, when regarded as trade intelligence for the guidance of producers faced with alternatives of action.

Other information serving a different purpose is of value to producers who contemplate the investment of capital in new developments and accordingly desire to obtain an idea of the future demand for the product they propose to cultivate. To enable them to form a judgment, they require, for their particular product, a review setting forth the production and consumption in the different countries of the world and the developments in sight.

We think that it is worth consideration whether on an Empire basis an Intelligence Service might not be organised which would aim at promptitude and such reasonable accuracy as would meet the requirements of practical men. Such an Intelligence Service would have to be organised trade by trade.

26. In the second place, we desire to express our opinion that the creation and assimilation of Empire standards in regard to many trades, both of primary production and manufacture, should greatly simplify the promotion of inter-Imperial trade. As we progress with our new function of supplying preliminary trade surveys we are more and more impressed with this requirement. Standards.

27. In the third place, we repeat the hope that under the lead of the Economic Organisation of the League of Nations further steps should be taken to secure that trade statistics compiled by the various Governments of the World should be based on such common rules as will render them more truly comparable. Uniform
Statistics.

IV.—CONCLUSION.

28. Finally, we would venture to direct attention to the fact that all our reports have been unanimous. We have felt it incumbent on us not to marshal differences within the Empire by the issue of majority and minority reports. Where we could not agree, we have abstained from recommendations. The cases, however,

have been rare when, after a patient hearing of all the interests involved, we have not been able to adjust our difficulties.

H. J. MACKINDER (Chairman).

THOS. ALLEN	}	United Kingdom.
A. BALFOUR		
F. N. BLUNDELL		
H. SNELL		
HARRISON WATSON	}	Canada.
W. A. WILSON		
F. L. MCDUGALL	}	Australia.
CL. BALLIEU		
J. H. DIMOND		South Africa.
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R. S. FORSYTH		
J. W. DULANTY		Irish Free State.
W. C. JOB		Newfoundland.
A. C. CHATTERJEE		India.
F. J. NEWTON		Southern Rhodesia.
G. GRINDLE	}	Colonies and Protectorates.
J. H. BATTY		

D. T. CHADWICK (Secretary).

T. L. CATLING (Assistant).

29th July, 1930.

Three tables of Trade figures similar to those given in our First Report, but applying to recent years, are appended.

TABLE I.

EXPORTS OF UNITED KINGDOM PRODUCE AND MANUFACTURES.

Annual average for 1904-13 and years 1927, 1928, 1929 and first six months of 1930.

Year.	Total Exports.	Exports to Empire.	Empire share of Total Exports.
	£	£	Per cent.
Annual average 1904-1913 (10 years).	408,439,504	141,934,405	34·75
1927	709,081,263 (672,881,396)	326,650,210 (290,450,814)	46·1 (43·2)
1928	723,579,089 (688,499,505)	327,667,902 (292,588,318)	45·3 (42·5)
1929	729,554,967 (693,468,572)	324,465,161 (288,378,766)	44·5 (41·6)
First half of 1930...	304,851,252	135,973,943 (118,229,039)	44·6 (38·8)

NOTE.—For purposes of better comparison with the earlier years, the figures in brackets exclude exports from the Irish Free State.

TABLE II.

EMPIRE SHARE OF UNITED KINGDOM EXPORTS OF PRODUCE AND MANUFACTURES IN 1928—TOTALS AND CLASSES I, II, AND III.

	£
<i>Totals.</i>	
Total United Kingdom Exports, 1928	723,579,000
Total United Kingdom Exports, 1928, to foreign countries ...	395,911,000
Total United Kingdom Exports, 1928, to Empire countries...	327,668,000
Empire percentage—45·3.	
<i>Class I. (Food, Drink and Tobacco).</i>	
Total United Kingdom Exports, 1928	54,257,000
Total United Kingdom Exports, 1928, to foreign countries ...	22,663,000
Total United Kingdom Exports, 1928, to Empire countries...	31,594,000
Empire percentage—58·2.	
<i>Class II. (Raw Materials).</i>	
Total United Kingdom Exports, 1928	70,146,000
Total United Kingdom Exports, 1928, to foreign countries ...	62,086,000
Total United Kingdom Exports, 1928, to Empire countries...	8,060,000
Empire percentage—11·5.	
<i>Class III. (Manufactured Goods).</i>	
Total United Kingdom Exports, 1928	578,869,000
Total United Kingdom Exports, 1928, to foreign countries ...	303,219,000
Total United Kingdom Exports, 1928, to Empire countries...	275,650,000
Empire percentage—47·6.	

TABLE III.

(i) POPULATION OF ; (ii) EXPORTS OF UNITED KINGDOM PRODUCE AND MANUFACTURES IN 1929 TO ; AND (iii) PER CAPITA PURCHASES ON 1929 BASIS OF ; CERTAIN EMPIRE AND FOREIGN COUNTRIES.

Country.	Estimated population (latest year available).	Exports of United Kingdom in 1929.	Per capita purchases on 1929 basis.
	In thousands.	£(000).	£ s. d.
(A) <i>Empire Countries.</i>			
Canada	9,796	35,008	3 11 5
Australia	6,373	54,231	8 10 3
New Zealand	1,470	21,396	14 11 2
Union of South Africa	7,895	32,538	4 2 4
Irish Free State	2,949	36,086	12 4 2
Newfoundland	267	909	3 8 1
British India	333,500	78,231	0 4 8
British West Africa	24,206	12,316	0 10 2
British East Africa	12,843	4,989	0 7 0
East Indies*	10,309	21,701	2 2 1
British West Indies†	2,002	7,343	3 13 5
(B) <i>Foreign Countries.</i>			
United States	120,700	45,581	0 7 7
Argentina	11,195	29,071	2 11 10
Sweden	6,105	10,548	1 14 6
Netherlands	7,833	21,822	2 15 9
Denmark	3,520	10,671	3 0 7
Brazil	39,104	13,383	0 6 10
Finland	3,612	3,363	0 18 7
China	458,700	14,030	0 0 7
Foreign West Africa‡	36,788	3,779	0 2 1
Foreign East Africa§	15,890	3,511	0 4 5
Foreign East Indies|| ... ..	97,540	12,943	0 2 8
Mexico	15,048	2,538	0 3 4
France	41,060	31,641	0 15 5
Germany	63,800	37,120	0 11 8
Italy	41,169	15,999	0 7 9
Soviet Russia	153,956	3,767	0 0 6

* Includes Ceylon, Straits Settlements, Federated and Unfederated Malay States, British Borneo, Brunei and Sarawak.

† Includes British West India Islands, British Honduras, British Guiana, Bermuda and Falkland Islands.

‡ Includes French, Belgian, Spanish and Portuguese West Africa and Siberia.

§ Includes Portuguese and Italian East Africa, French Somaliland and Abyssinia so far as the particulars are available.

|| Includes Netherlands East Indies, Philippine Islands, French Indo-China and Siam.

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Imperial Economic Committee
Eighteenth Report

TEA

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Mr. F. N. Blundell		
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Eighteenth Report : Tea

- To the Right Honourable J. RAMSAY MACDONALD,
Prime Minister and First Lord of the Treasury.
- To the Right Honourable R. B. BENNETT,
Prime Minister of the Dominion of Canada.
- To the Right Honourable J. H. SCULLIN,
Prime Minister of the Commonwealth of Australia.
- To the Right Honourable G. W. FORBES,
Prime Minister of the Dominion of New Zealand.
- To General the Honourable J. B. M. HERTZOG,
Prime Minister of the Union of South Africa.
- To WILLIAM T. COSGRAVE, Esq.,
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Prime Minister of Newfoundland.
- To the Honourable H. U. MOFFATT, C.M.G.,
Premier of Southern Rhodesia.
- To the Right Honourable W. WEDGWOOD BENN, D.S.O., D.F.C.,
Secretary of State for India.
- To the Right Honourable Lord PASSFIELD,
Secretary of State for the Colonies.

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REPORT

I. INTRODUCTION

We, the Imperial Economic Committee, appointed by the Governments of the United Kingdom, the Dominions, India, and the Colonies and Protectorates, acting under our terms of reference published on the 6th March, 1925, beg leave to present to the Governments of the Empire this our eighteenth report—*The Preparing for Market and Marketing of Tea.*

Witnesses.

2. We have examined a number of witnesses representing producing and marketing interests, and we have further had the advantage of consultation with experienced officials both of the United Kingdom and oversea Governments, and with men of scientific eminence. We thank them and all those who have appeared before us, or otherwise aided us in our enquiry, for their skilled assistance.

II. POSITION OF THE EMPIRE IN WORLD TEA TRADE

3. In less than a hundred years the British Empire has become the tea garden and the tea shop of the world. To-day, tea forms, by value, one per cent. of the total of all merchandise entering world trade. Over 70 per cent. of that tea is produced and nearly 70 per cent. of it is consumed within the Empire. Over two-thirds of the entire capital engaged in the production of tea are provided by the Empire. All the machinery employed in India and Ceylon in the manufacture of tea is of Empire origin. Over 60 per cent. of the chests there used for its transport are imported from Empire countries. In production, manufacture, transport and distribution, tea is to an exceptional degree an Empire industry.

Predominance of Empire as producer and consumer.

4. The present world export position is summarised in the following table. The predominance of the Empire product is at once apparent, as is also the remarkably small proportion—8 per cent.—of the total that is now represented by exports of tea from China. To-day the chief foreign competitors are Java and Sumatra. Exports from Japan and Formosa, which consist of green tea, are stationary, and are important chiefly in one market, that of the United States, where they are declining in consequence of a gradual change of taste in favour of black teas. A small quantity of the finer grades of Formosa tea is imported into the United Kingdom.

World Exports of tea in 1928 and 1929 (calendar years) in million lbs.

	1928	1929	
India	355.5	380.4	42% 28%
Ceylon	236.7	251.5	
Nyasaland	1.4	1.7	
South Africa	.1	.1	
Total from British Empire	593.7	633.7	
Java and Sumatra	153.5	161.3	18%
China (Black and Green)	76.8	73.0	
Japan and Formosa	33.4	32.8	
Total from Foreign Countries	263.7	267.1	
Total from all Countries	857.4	900.8	
Empire percentage	69.1	70.3	

5. Tea does not come within the category of those Empire products that have yet to win their way in the United Kingdom market. Of the total of all black and green tea entering world trade, more than one-half is retained in the United Kingdom, where the consumption of tea now exceeds 420 million lbs., and represents 9.2 lbs. of tea per head per annum, of which 82 per cent. is grown within the Empire. These are high figures. While the immediate problem is to maintain the commanding position already won by Empire grown tea, the conclusion is evident that the future market expansion required by this still expanding industry is not to be sought in the United Kingdom alone. In our report we have therefore taken into account the possibilities of certain markets overseas.

III. GROWTH OF THE TRADE

6. Tea, Coffee and Chocolate are now so much taken for granted that it is easy to overlook how deep and how recent is the revolution they have effected in social life, yet the time is almost within living memory when beer was the breakfast beverage of the public school boy. Although the trade in China tea was already of considerable importance before the end of the eighteenth century, the industry in India and Ceylon, which now supplies over four-fifths of the United Kingdom import, is younger than the railway, and has indeed not yet seen its first centenary. Early days.

7. As all the world knows, tea, both name and beverage, came originally from China, where it had existed from very early times

and was in use as a drink in the eighth century. It was introduced into England early in the seventeenth century, but in the year after the Restoration it was still a curiosity to Pepys, who mentions it as a concoction recommended by the chemist for combating a common cold. Increasing contact with the East, however, led to a craze for things oriental and exotic, and although the pagoda and the black page-boy are forgotten, the use of porcelain, which accompanied tea, has been of hardly less social importance than tea itself.

8. In the days of Queen Anne, tea began to be a frequent, though still occasional, indulgence of fashionable society, but as the century wore on, tea drinking spread rapidly, and with Dr. Johnson it was no longer a curiosity or a fad, but already a habit—almost a vice—which he indulged not sometimes but at all times, especially after midnight. In 1703 the import had been some 100,000 lbs., but by the year of Trafalgar it had reached $7\frac{1}{2}$ million lbs., and re-exports a million pounds, and the authorities had long since discovered the value of the commodity for revenue purposes.

Beginning
of Empire
production.

9. Hitherto, and for some time yet, tea, though widely used and an important article of trade, remained a "China drink." The beginning of tea production within the British Empire almost exactly coincides with the dawn of the Victorian era. In 1836 a sample of one pound had been sent to London by the East India Company, after experiments in Assam. Two years later came a consignment of 488 lbs., which fetched 9s. 5d. a pound, and in 1839 the first Indian Tea Company was formed. In 1854 the export of Indian tea already reached 250,000 lbs., and by 1866 it had increased tenfold.

The tea
clippers.

10. The growing importance of the tea trade during this period was incidentally the origin both of the American bid for supremacy in the carrying trade, and of the successful reply of the British designers with that series of famous tea clippers, from the *Challenger* to the *Thermopylae* and the *Cutty Sark* which, with the wool clippers, made the British merchant sailing vessel the finest and fastest in the world.

India.

11. It is possible that the growth of prosperity in the third quarter of the nineteenth century helped the progress of the Indian (and later the Ceylon) tea industry by offering an expanding market in the United Kingdom, where the consumption of tea now rose rapidly. In 1840 it amounted to 1.2 lbs. per head; in 1854 this had doubled; thirty years later it had doubled again, and at the close of the century was 6.07 lbs. per head.

By this time the Indian tea industry had reached great dimensions. Figures for acreage and production in some recent years are given in the following table.

Tea Production in India

	Area under tea in thousand acres	Production in million lbs.
1901	524	201
1921	709	274
1924	714	375
1928	773*	404

Details of production in the different provinces of India are given in Appendix A. The chief districts recognized in the trade—with production figures for 1928 in million lbs.—are Assam (173), Darjeeling (95), Cachar and Sylhet (72) and Southern India (57).

12. The first experiments in tea planting in Ceylon, which began Ceylon. about the same time as in India, were not encouraging. In the middle seventies, however, when disease brought disaster to the coffee plantations—then covering 275,000 acres—a determined attempt was made to replace them, first with cinchona and then with tea. This time, greater experience, aided perhaps by the steamship and the Suez Canal, brought rapid and startling success. By 1880 the export was 162,000 lbs.; five years later it was over 4 million, and in another five years it reached 45,800,000 lbs. These were, of course, the phenomena of early growth, but even in recent years there has been remarkable expansion, the export having increased by 74 per cent. since the turn of the century.

Ceylon Tea Production

	Area under tea in thousand acres	Export in million lbs.
1901	406	144
1921	418	161
1924	440	204
1929	450†	251

13. In addition to the great production of India and Ceylon, an Africa. increasing amount of Empire grown tea comes from Africa. The figures for production in 1928-29 are as follows.

	Planted area in acres	Production in thousand lbs.
Union of South Africa	2,000	800
Nyasaland	8,900	1,745†
Kenya	5,600‡	150

The industry in Natal is of old standing, experimental plants being known in the Botanical Gardens of Durban in 1851. Com-

* The figure is that of the planted area for the year.

† Exclusive of small holdings which are estimated at 20,000 acres.

‡ Exports.

§ Much of this was new plantations not in bearing in 1928-29. The planted area was further increased in 1930. See paragraph 15 below.

mercial production dates from the importation of plants from Assam in 1878, but in recent years the provision of suitable labour has been a difficulty. A large proportion of the produce is consumed within the Union. Of the export, 86 per cent. goes to the United Kingdom.

14. The industry in Nyasaland goes back to the attempts of the missionaries to establish experimental plants in the garden of the Blantyre Mission, which eventually succeeded in 1887. Commercial production began in 1900. For some time, however, the seed problem, especially the importation of seed from India and Ceylon, was a serious difficulty. This has now been overcome, and the old stock is gradually being replaced by plantations raised from Indian and Ceylon seed. The principal areas are in the Mlanje and Cholo districts. Practically the whole of the crop is exported to the United Kingdom. This trade will undoubtedly be facilitated by the construction of the Lower Zambesi Bridge, which is now being undertaken.

15. Tea planting in Tanganyika and Kenya is a more recent development. In Tanganyika, suitable areas are reported to be somewhat limited and scattered—conditions which would hinder large-scale production and co-operative handling. Early difficulties with seed importation are being overcome, and the Government is assisting with grants for obtaining seed from India. About 1,000 acres are now under cultivation. In Kenya, the planted area in 1930 amounted to about 9,000 acres, and though only a small proportion is yet in bearing, further areas were reported to be coming into bearing in 1930, and production should show considerable increase over the 1928-29 figure of 150,000 lbs. Moreover, the area taken up for tea planting is very much larger than that already planted—one undertaking alone having acquired some 25,000 acres. The tea produced is of a medium quality which should be useful for blending purposes, and future yield per acre is expected to be high.

Malaya.

16. Still more recently, successful experiments have been made in the highlands of Malaya, and these areas are now attracting attention as offering considerable possibilities for tea production.

China.

17. Although no figures are available, the production of tea in China is believed to be very large, but it is principally a peasant production, grown in the immediate vicinity of the peasant's homestead, and gathered and prepared by his family. Failure to keep pace with the large scale production and the more scientific and more hygienic methods of machine manufacture on the tea plantations in India and Ceylon facilitated a general change of taste among consumers, and particularly in the United Kingdom. China tea is no longer a serious rival of the Empire grown product, although for the few it will remain attractive on account of its distinctive flavour. Those who prefer it, prefer it as it is, and the

high quality China teas sold in the United Kingdom, if blended at all, are blended with one another, rather than with teas of other countries. Certain kinds, however, such as the Oolongs, are employed as flavourings in blends of Indian and Ceylon teas, while some distinctly inferior grades are also employed in the United Kingdom in the cheapest blends.

18. The decline in the China tea exports even in the present century is striking. In 1928 the exports of black and green tea were only half those at the end of the last century. In brick and tablet tea—which is a special trade between China and Russia—exports have also fallen, though they have recovered somewhat from the low level reached shortly after the Russian Revolution.

Exports of Tea from China, in million lbs.

	Black and Green	Brick and Tablet
1899	153.6	71.2
1913	109.2	82.2
1923	98.0	8.8
1927	77.6	38.6
1928	76.8	46.6

19. Although China is no longer a serious rival, Empire-grown tea in recent years has been faced with increasing competition from tea grown in Java and Sumatra. Tea was grown in Java as a curiosity as far back as the seventeenth century, but production on a commercial scale began about the same time as in India. Considerable improvement followed the introduction in 1873 of Indian seed from Assam, which has now largely replaced the Chinese variety. In 1911, 500 acres were planted in Sumatra, and in both Islands development has been stimulated by the increasing demand for tea during and after the war.

Nether-
lands East
Indies.

A. Area under Tea in Java and Sumatra, in Thousand Acres

	Java		Sumatra		Total	
	Planted	In bearing	Planted	In bearing	Planted	In bearing
1924	207	195	29	26	236	221
1928	235	202	53	34	288	266

In addition, there were in Java in 1928 some 83,000 acres under cultivation by native growers, of which 66,000 acres were in bearing.

B. Exports in million lbs.

—	Java	Sumatra	Total
1917	80.2	4.1	84.3
1924	105.1	17.9	133.0
1928	134.4	19.1	153.5

Exports from principal countries in recent years.

20. The figures for the tea exports from the principal exporting countries over the period 1924-1929 may now be grouped together as follows.

Tea Exports, in million lbs., for Calendar Years 1924-1929.

—	India	Ceylon	China (Black and Green)	Java	Sumatra	Total
1924	344.4	204.9	91.3	105.1	17.9	763.6
1925	336.2	209.8	88.0	94.8	16.6	745.4
1926	339.0	217.0	82.9	118.9	17.4	775.4
1927	366.5	227.0	77.6	126.9	17.6	815.6
1928	355.8	236.7	76.8	134.4	19.1	822.8
1929	380.4	251.5	73.0	138.4	22.9	866.2

Apart from the decline in the case of China, there has been no very great change, during these six years, between the relative proportions of the different countries in the total. In 1924 India and Ceylon together accounted for 72 per cent., and Java and Sumatra for 15.9 per cent., and in 1929 the figures were 73 and 18.6 per cent., respectively. Between 1924 and 1929, the exports from the four countries, India, Ceylon, Java and Sumatra, increased by 121 million lbs. To this increase India and Ceylon contributed 82 million, and Java and Sumatra 38 million lbs.

IV. CULTIVATION AND PREPARATION FOR MARKET

Cultivation.

21. The successful preparation of tea for export involves manufacture as well as husbandry, and at every stage care and organisation are required. Quality, no less than economical production, depends on constant supervision in the garden and skilled handling in the factory. The young tea bush reaches maturity in three or four years, but is not in full bearing till the seventh or eighth year. Neither the very young nor the very old bush yields the best tea, and the planter must wait for his return and should pursue a systematic policy of replacement. Left to itself, the bush would grow to a height of 20 or 30 feet, and is therefore regularly kept down to about 3 or 4 feet, to facilitate plucking and ensure

a supply of young and tender shoots. The degree, manner and frequency of pruning have an important bearing on the quantity and quality of leaf, and are subjects of controversy in the industry.

22. When the plant "flushes," the shoots will appear above the general level of the bush, much as the new growth of a privet hedge in spring. As, however, the tea of commerce can only be made from the youngest and tenderest leaves of the "flush," and these must be at least sufficiently developed, the tea bush cannot satisfactorily be clipped as is the privet hedge—though several mechanical devices have been tried. The work is carried out by women who, with quick eye and deft fingers, rapidly choose and pluck the leaves—right and left hand operating simultaneously. Plucking.

23. The gathered leaf is taken as quickly as possible to the factory, where it passes through several stages such as withering, rolling, fermentation, firing, sorting, and packing. The first stage—withering—may occupy a period varying, according to climatic conditions, from 10 to 30 hours, and plays a very important part in determining the quality of the tea. Upon the comparative slowness and evenness of the process much depends. The leaves are so spread as to allow of free upward and downward circulation of the air. Where climatic conditions allow, the sides of the building are open to the outside air. In some districts, owing to the humidity, it is necessary to wither the leaf in closed rooms, through which carefully controlled currents of air circulate, the object being not to raise the temperature, but to counteract the humidity of the atmosphere. Manufacture.

The process of rolling twists the leaf and breaks open the cells containing the properties that give strength and flavour to the final product. The juices liberated by rolling form, when dry, a soluble extract which is released when the tea is brewed. The rolling may be so carried out that a proportion of the leaf itself is broken and goes to form, without any subsequent cutting, part of the "broken" grades which are nowadays preferred for their superior liquoring quality.

After being rolled, the leaves are spread out and left to ferment. Here, again, it is important to arrest fermentation at the right moment, for if it goes too far, quality and flavour will be spoiled. The fermented leaves, still damp and sticky, are now spread on the perforated or wire trays of a firing machine, and submitted to a hot air current for a short period during which they assume the black appearance with which everyone is familiar. In the course of the processes enumerated, the leaf loses 75 per cent. of its weight.

24. The tea is now known as "made" tea, and is next vibrated through sieves of varying mesh and sorted into grades. It is important that the leaf in each grade should be even in size and true to type. Although there are no fixed standards for each grade,

the differences between them are well known on the market and any mixture is soon detected. The recognised trade descriptions are—Broken Orange Pekoe, Orange Pekoe, Broken Pekoe, Pekoe, Pekoe Souchong, Broken Pekoe Souchong, Souchong, Fannings, and Dust. Larger leaves may be cut in a separate machine to enable them to pass the sieves. The larger proportion, however, of the better broken grades consists of the smaller leaves which pass the sieves in the first sifting.

25. The sorted tea is then packed by machinery into chests and half chests. These are lined with lead or aluminium foil to protect the tea from the atmosphere, to which it is highly sensitive. Even so, tea is sometimes affected by juxtaposition in ships' holds with cases of fruit such as oranges. The broken grades, consisting of small-leaf tea, are usually packed into half chests, as they would over-weight the full-size chests. The average net weights of the chests vary with the country of origin. The Indian chest is 118 lbs. and the Ceylon 106 lbs. Both Indian and Ceylon half chests are 70 lbs. The Java chest is 110 lbs. and the half chest 64 lbs.

Green Tea. 26. In the preparation of Green Tea, the leaf is steamed before rolling, and not allowed to ferment. Only a comparatively small amount of Green Tea is made in India and Ceylon: the bulk is produced in China for home consumption and the Russian and American markets. The chief grades are known as Young Hyson, Hyson 1 and 2, Gunpowder, and Dust.

Brick and Tablet Tea. 27. Brick and Tablet teas consist of coarser varieties, which, together with small twigs, are compressed into tablets or bricks. There is a considerable industry in China (in which British capital has been interested) for the manufacture of such teas for the Central Asian and Russian markets.

Deter- minants of quality. 28. It is undoubted that the finest flavoured teas are produced from gardens in which the rate of growth of the young leaf is slow. Gardens situated at high altitudes like those in the Darjeeling District and in the higher parts of Ceylon thus possess natural advantages for the production of high quality teas. But quality does not depend solely on location. It is very largely under control, not only during cultivation but still more in the subsequent treatment of the leaf in the factory.

Seasonal variations. 29. In Northern India the crop is seasonal and plucking is confined to about eight months—from April to November, and more than half the crop is produced in July, August and September. In Southern India, Ceylon, Java and Sumatra the crop is distributed over the whole year, but nevertheless there are important seasonal variations, due mainly to the advent of the rains which produce a more abundant but inferior "flush" of leaf. The times of year at which the best tea is produced vary accordingly from one area to another. Abundant flush of leaf after the rains may also be a

severe test of labour supply for plucking and of factory accommodation for handling the leaf.

30. To obtain the best results it is essential that each plucking round should be completed in time to begin another before a new flush of leaf is too far forward. Where, for instance, the bush flushes every seven days, the aim is to get right round the garden within that time. If the labour supply is for any reason inadequate it may be difficult or impossible to do this, and the quality of the tea will be below that which the particular garden might otherwise have produced. Labour supply.

31. In respect of labour supply, the most fortunate area within the Empire is Southern India, where the supply is greater than the demand; indeed the Madras Presidency serves as one of the sources of labour not only for the tea gardens in India and Ceylon, but for other plantation crops in India, Burma, the Malay States, and the Straits Settlements. In Ceylon, although the labour for the tea gardens consists almost entirely of Tamils recruited from Southern India, and the expense of importation adds to the cost, the supply is now considered to be more adequate.

32. In Northern India, the cost of recruiting and transporting labour over so vast an area is a very real problem for the industry, and in Assam may amount to as much as £20 per head. In the interests of the labourers and their families (for the tea gardens provide work for women and children as well as men) the migration of labour to Assam, where many gardens are situated in remote tracts of country, is at present strictly regulated by Government, but the whole question of labour conditions in the Indian Tea Gardens is under consideration by the Royal Commission on Labour in India.

33. Conditions in the two chief tea producing islands of the Netherlands East Indies are in certain respects in marked contrast. In Sumatra there is an abundance of land available for tea but a scarcity of labour, which has to be brought from Java. In Java, labour is abundant, but suitable land for future expansion is scarce. Labour supply in Java and Sumatra.

34. Where factory accommodation is inadequate to cope with an exceptional flush such as occurs at certain times of the year, the all important process of withering will not be satisfactorily carried out. Quite apart from the questions of factory organisation which we touch upon later in connection with research, we would urge the importance—already recognised by the more progressive estates—of sparing no effort to improve the capacity of such factories as are not yet adequate. While it may be uneconomical for the factory capacity to be based on a maximum day, it appears to be practical to base it on a point half way between a peak day and an average day. It has been suggested to us that the days of the small factory are numbered. Once it is recognised how vitally Importance of adequate factory capacity.

the manufacturing stage affects quality, the need for better control in the factory becomes evident. It is often impossible on a small estate to provide a specially trained man for whole time work in the factory. Indications point to larger scale factories in the future, with better equipped staff, serving larger areas.

Factory accommodation in Sumatra.

35. In the matter of factory accommodation and equipment, Sumatra enjoys an advantage at the moment, mainly owing to the fact that planters there have been able to profit by the experience and progress of India and Ceylon. The industry is young, and some of the factories not only have a very large capacity, but are equipped with the latest machinery. On one estate, we were informed, a factory is being built with a capacity of 4 million lbs. per annum.

V. THE UNITED KINGDOM MARKET

(A) IMPORTS AND RE-EXPORTS

London the centre of the tea trade.

36. A considerable portion of the Indian and Ceylon crop comes to auction in Calcutta and Colombo for direct export to the countries of final destination, especially to Australia and New Zealand, the Far East, and America. The centre of the tea trade, however, remains and is likely to remain in London; for not only is the United Kingdom the largest consumer of tea in the world, but London's re-export trade in tea is in itself greater than the tea import of the United States, the next largest importer. In all nearly two-thirds of the world's tea trade is dealt with in the United Kingdom market.

United Kingdom gross imports.

37. The gross imports of tea into the United Kingdom, which have nearly doubled in 30 years, amounted in 1929 to 559.1 million lbs. in volume and £36.5 millions in value.

Gross imports of Tea into United Kingdom

	<i>lbs. (millions)</i>	<i>£ (millions)</i>
1899	288.9	10.6
1909	341.7	11.6
1919	494.3	33.0
1929	559.1	36.5

In the total for 1929, Empire-grown tea accounted for 462.6 million lbs. or 82.6 per cent., of the volume, and £32.2 millions, or 88.2 per cent., of the value.

United Kingdom re-exports.

38. In the period 1924-1928, re-exports of tea from the United Kingdom increased at an average annual rate of 5.35 million lbs. In 1929 they again increased by 5.4 million lbs., and amounted to 95 million lbs., or nearly double the average for the pre-war quinquennium, which was 50 million lbs. Of the total re-exported in 1929, 86 per cent. was Empire grown, as compared with 84.7 per cent. in 1928 and 84.5 per cent. in 1924.

39. The following table gives the figures for the retained imports in the United Kingdom and the respective share of Empire and foreign grown teas in the total. It will be observed that there has been a considerable increase in the net import of tea from the Netherlands East Indies, which has advanced by 52 per cent., as compared with 6 per cent. for Empire grown teas and 7 per cent. for the total net imports. The percentage rate always tends to exaggerate the progress of a new competitor, and the Empire total, large as it was in 1924, has increased by 15 million lbs. as against the 25.4 million lb. increase of Java and Sumatra teas, and still constitutes more than 80 per cent. of the total net import. Nevertheless, the advance made by the principal competitor from 11.4 per cent. of the total in 1924 to 16.1 per cent. in 1929 is a fact to be reckoned with.

United
Kingdom
retained
imports.

Retained Imports of Tea in the United Kingdom

	Amount in million lbs.			Percentage of Total		
	1924	1928	1929	1924	1928	1929
India	253.5	239.4	251.9	58.3	57.2	54.3
Ceylon	111.3	112.5	126.2	25.6	26.8	27.2
Other British Countries	1.2	1.3	2.8	.3	.3	.6
Netherlands East Indies	49.6	60.6	75.0	11.4	14.5	16.1
Other Foreign Countries	19.0	5.0	8.2	4.4	1.2	1.8
Empire Total	366.0	353.2	380.9	84.2	84.3	82.1
Foreign Total	68.6	65.6	83.2	15.8	15.7	17.9
Total	434.6	418.8	464.1	100	100	100

(B) THE LONDON SALES

40. The tea is despatched by the garden managers to the local port where the managing agents consign it to their corresponding firm in London, who undertake the marketing. From the docks it goes into warehouses, where, until the duty was finally removed in 1929, it was held in bond. With the exception of China tea, which is now a relatively unimportant fraction of the whole and is sold by private treaty, the great bulk is put up for public auction by selling brokers acting for the managing agents, and bid for by buying brokers acting for the blenders and dealers.

The London
sales.

Before the sale, the selling brokers inspect the packages in the warehouses, draw samples from each "break", test the samples in the offices, and issue catalogues. If any "break" is found to

run unevenly, it is turned out in the warehouse, and re-bulked. Catalogues being issued, the tea is put on show in the warehouses and samples are exhibited in the sale rooms. The next stage is for the buyers to draw samples for valuation. By the time the day of sale arrives, both buying and selling brokers have formed their idea of the value of each break, and have received instructions from their principals. The selling brokers are usually instructed to sell "at best", but may be instructed not to sell below a given price. It may be noted in passing that in the averages for the results of the week's sales, issued by the London Tea Brokers' Association, the unaccepted bids are included in the calculation. When any lot is thus withdrawn, the selling broker endeavours to sell it later by private treaty.

41. In the Report of the Food Council of the United Kingdom on the rise in wholesale tea prices in 1925, the practice in the London Tea Auctions is described in detail. The account there given is fully borne out by the evidence given in our own enquiry, and we therefore quote the following paragraphs:

42. "In addition to acting as Selling agents on behalf of the producer, selling brokers also do a certain amount of business on behalf of purchasers whose orders they have received before the auction. These orders are placed through the selling brokers' "market men", who appear in the box with the selling brokers, and bid precisely as do other persons in the room. We have been informed that the market man does not disclose his top price or his orders to his principal, but buys as cheaply as he can. If he disclosed the orders given to him in confidence by the buyers or bought at prices higher than the market he would quickly lose his business. Business of this character is principally done on behalf of smaller shippers who supply Continental orders. The market man receives a salary from the selling broker, and is therefore his employee, but he also receives $\frac{1}{2}$ per cent. commission on purchase, this $\frac{1}{2}$ per cent. being additional to the 1 per cent. received by the selling broker. Although on the face of it, it may appear unlikely that these market men can act in a dual capacity without prejudice to the interests of either selling broker or buyer, we have received no evidence to the effect that the arrangement operates unfairly to either party.

43. "Generally, the selling broker acts in the interests of the producer, and his duty is to obtain the highest price for the teas placed on the market by producers, in return for a remuneration of 1 per cent. on the selling price. We have received no complaints against selling brokers. They appear to carry out their duties with satisfaction to the trade and without detriment to the consumer. In fact, they form an essential part of the organisation for placing tea at the consumer's disposal.

44. "The immediate purchasers of most of the tea auctioned at Mincing Lane are the buying brokers. They number about a

dozen, and are members of the Tea Buying Brokers' Association of London. Six of these firms have been described to us as relatively big firms. Buying brokers do not normally buy tea to hold, but resell later to dealers, blenders, and merchants at a commission of $\frac{1}{2}$ per cent. In practice all purchasers of tea who do not give their orders to selling brokers' market men (a procedure which is described above), buy tea through buying brokers, except that occasionally as a convenience, distributors' representatives will bid in the room if their buying broker is not present or is occupied, but the business is always put through the buying broker, and the buying broker is paid his commission of $\frac{1}{2}$ per cent. We have been informed that during the last 40 years there has been a change in practice, and buying brokers now obtain a bigger proportion of the orders as compared with the selling broker than was once the case. Although the auctions are public, and nominally anyone is entitled to bid, it has been stated to us that if a bidder, not a recognized buying broker, were to enter the market, or, if one of the big distributors were to instruct his buyer to bid at the market, not through the intermediary of a buying broker, the buying brokers would "run" the price with the object of securing that all sales of tea should pass through their own hands.

45. "According to the evidence given to us by the Tea Buying Brokers' Association of London, buying brokers assist the trade (1) by selecting suitable teas in public sale for their clients and submitting samples and valuations to those clients, (2) by executing part orders for a parcel of tea and taking over the balance of the parcel, thus enabling the smaller dealer to obtain the tea he wants, (3) by executing confidentially orders for clients who very often have no time to attend the sale themselves, (4) by buying as cheaply as possible in the sale.

46. "The bidding for tea is done in pence and farthings per lb., and the same price is frequently offered by many buyers, none of whom may be willing to raise his offer. The parcel then goes to the first bidder, and it will be of advantage to other buying brokers who need supplies to repurchase the tea from him and divide the commission with him rather than to offer an extra $\frac{1}{4}$ d. per lb. After purchase of a particular 'break' other buying brokers will therefore frequently call to the successful bidder, and generally, if not invariably, the bidder divides up his consignment at the purchase price, sharing the commission of $\frac{1}{2}$ per cent., with the other buying brokers. In effect, therefore, two sales are going on simultaneously in the same room.

47. "It often happens, however, that buying brokers in anticipation of orders from clients in the near future, will buy tea for which they do not possess orders. These teas are placed on a 'bought-over list' and, in fact, whatever quantity of tea is not resold by the buying broker in the auction room is normally placed

by him on his 'bought-over list.' These lists are issued daily, and from them dealers, blenders and other distributors select the quantities and kinds of tea which they require.

We are informed that many firms rely entirely on the "bought-over lists" for their supplies, and it is claimed that this eliminates much competition from the auction room.

48. "At first sight it would appear that the buying broker is an unnecessary unit in the chain of distribution and that his intervention merely has the effect of raising the price of tea, both by increasing the strength of the bidding, and to the extent of the buying brokers' commission of $\frac{1}{2}$ per cent. There are however, two reasons which are put forward in justification of the buying brokers' existence. The first is that he enables smaller purchasers of tea to obtain portions of parcels instead of being obliged to purchase the whole of one parcel at the auction. The results are stated to be that to this extent bidding is decreased and the purchaser is enabled to offer his client (who is generally the grocer) a larger selection of teas. The system may therefore on these grounds be a convenience to the consumer. The second reason is that purchasers are able to conceal their identity by making use of the buying broker's services. If the distributor instructed his buyer to bid openly in the auction his competitors would have information as to the nature and quantity of his business, and this might result in loss of trade. We are informed that the buying broker has been in existence from very early days, and that his influence in the market has steadily grown. It seems to us unlikely that if as a general rule, he performed an uneconomic function his clients would have continued increasingly to do business through him. If tea distributors prefer to disguise their buying under the cloak of the buying broker it is to be presumed that they do so because it suits them. Elimination of the buying broker would result in the large tea distributors instructing their buyers (who in spite of their name do not actually bid at the auction they attend, but are the permanent employees in charge of the buying departments of the distributing firms) to make bids in the auction room. The effect might very well be a combination of some or all of the larger distributing firms to drive out of the market the smaller distributors who at present obtain their supplies under the cloak of the buying broker."

Concentration of buying in a few hands.

49. An outstanding feature of the London tea market is the remarkable degree in which the buying is now concentrated in the hands of a few powerful combinations—principally blenders and distributors of proprietary blends. We have been informed that one interest alone now controls about one-sixth and another interest one fifth of the home distributing trade in the United Kingdom, while by means of a group agreement the buying of five other distributing interests is now under a single control. It is estimated

that about 70 per cent. of the home distributing trade is now in the hands of four combinations, and thus the operations of four men determine the prices in the sales. Owing to the magnitude of the trade of these combinations, it is essential that they should not be caught short of a supply of the various teas required for their blends in quantities sufficient for their out-turn. This, we are told, leads in certain conditions of the market to very keen competition between the interests concerned, and an increase in prices which is not justified by the statistical position. In a highly sensitive market such as the tea market is, the entry of one of these big buyers may be sufficient of itself to produce an exaggerated inflation of prices. On the other hand, the absence of one of the big buyers for any considerable period may in itself cause a depression in prices. These fluctuations are dangerous for the growers because during the periods of inflation they may misjudge the position and increase their crop by coarser plucking, and the increased offerings arrive to find the market flat.

50. For producers, no less than for distributors and consumers, a steady level of prices is the ideal, and it is arguable whether, now that concentration among buyers has gone so far, some form of concentration among producers might not be an advantage. Producers both in India and in Ceylon have formed associations for dealing with matters of common interest to the trade, but there has been no attempt to develop a central selling organisation. Common action hitherto has been directed to special or temporary objects. For instance, the Indian Tea Association has been able to arrange that in the second part of the sales season, the weekly offerings of the North Indian crop (more than half of which is gathered in three months) are spread over the remainder of the year. They are also endeavouring to induce other producers' associations to adopt a similar practice. To the temporary agreements belong the restriction schemes which are examined in paragraphs 98 to 102 below.

Possibility
of
combination
among
producers.

51. The same Association has also for some years discouraged among its members the practice of forward sales, mainly on the ground that in a rising market the buyers may re-sell and obtain the advantage that might otherwise have gone to the producer. In 1929 the agreement to abstain from forward sales was not renewed, but only a very few gardens have in fact changed their policy. It may be noted, however, that producers in the Netherlands East Indies adopt a contrary practice. They are of opinion that to sell at any rate a proportion of their crop forward is profitable on balance. In the course of our enquiries into the marketing of other commodities, the balance of evidence has usually been in favour of forward selling, as exerting a steadying effect on prices.

52. A general policy, however, for combined selling would involve a higher degree of organisation than has yet been achieved,

and to be successful would require common action between producers in Ceylon and India, and also considerable capital resources. Some degree of combination might be effected through the "agents" who now undertake the marketing. These "agents" are more properly described as merchant bankers. In many cases the present tea producing companies were established on the initiative of these agents, who had financed the original planters, and they are not only represented on the Boards, but in reality control the companies of which they are nominally the servants. As each firm of "agents" is connected with several companies, the number of agents is thus comparatively small, and combined action should be correspondingly less difficult.

The *nuclei* for forming a selling combination thus exist, but we cannot disguise the fact that it would be much more difficult for the tea producing interests to organise a common selling agency than it is for the producers of many other agricultural products—e.g. wheat—owing to the almost innumerable differences in quality between the produce of different gardens. None the less, certain of the producing interests regard some such combination as a necessary future development.

(C) THE DISTRIBUTIVE TRADE

Tendency towards large-scale distribution.

53. In the course of the last 30 years the subsequent stages in the marketing process have undergone important changes. In the older organisation, which still continues, the dealer distributed the tea in the original chests to secondary wholesalers or retailers by whom it was blended for retail. The "dealer" in this sense, however, has been to a very considerable extent superseded by the "blender" who blends the tea on a large scale and distributes it to the retailer either "loose," or, more frequently, in packets. The blender may also be part of a multiple shop organisation, distributing the tea either solely through its own chain of retail shops, or through other shops as well. The great bulk of the tea thus distributed is sold in packets as a proprietary article.

Advantages of large-scale distribution.

54. Two services, it may be claimed, are rendered through the large-scale distribution of packet teas. The first is freshness of supply. Certain of the great wholesale blending firms maintain a weekly delivery to thousands of retail agents in town, village, and hamlet throughout the length and breadth of the country, who purchase, on a strictly cash basis, just so much as will cover their weekly turnover. Apart from the price economy involved in such cash trading, the retailer is enabled to work on a minimum of capital invested in stock, and to supply his customers with freshly packeted tea within a week of its leaving the blending house, where it has been stored in the manner best suited to an article so sensitive to the atmosphere—i.e. in bulk, in the original chests, and isolated from all other produce.

55. The second service claimed for blending on a large scale lies in evenness of quality. Teas vary greatly, between garden and garden, district and district, season and season, and to maintain uniformity in a blend for any length of time, not only a wide range of purchase, but experience and ingenuity are required. By means of their capital resources, the big blending firms are in a position to exercise the widest possible range of purchase, and to employ the highest available skill for selecting the constituents of their blends and for matching them to maintain a uniform standard. From year to year, or even from one month to another, the constituents of a given brand of packet tea (which may be a blend of teas from a dozen or more gardens) may vary considerably, while the resultant flavour will remain uniform.

56. There is however another side to the picture. Both grocer and customer may no longer have any idea of the special characteristics which distinguish the teas of Assam, Darjeeling, Travancore, and Ceylon. Almost forgotten is the housewife who selected her tea as she would her meat or vegetables, and bought small quantities of the various growths to blend them herself at home. The local grocer may now do no more than supply the particular proprietary brand the customer asks for, with no personal interest in pushing the sale of tea as such, having become simply a middleman supplying a demand which is determined by the advertising of the proprietary tea firms, and the degree in which any brand may satisfy the taste of his customers.

57. This is of course a tendency by no means confined to the selling of tea; it affects the grocery trade as a whole, and everyone is familiar nowadays with the ubiquity of the packet and the tin. In order to ensure that the grocer shall be something more than a medium for the sale of other people's goods, much useful work has been done in recent years by the Institute of Certificated Grocers, incorporated in 1909, which includes, among other aims, the endeavour "to further the practical and technical education" of the young men in the grocery, provision, and allied trades, "in conjunction where possible with apprenticeship, and to hold examinations and grant certificates and prizes, and through this means to increase the interests of Assistants in their work . . ." The following are among the topics in the tea syllabus for the Courses and Examinations of the Institute: the principal countries of origin; characteristics of the principal growths and varieties; methods of identification in the dry leaf and by tasting; reasons for blending; the pairing of teas in dry leaf and liquor; the placing of blends in order of value; and the importation, marketing and distribution of tea. The number of candidates in these examinations has risen from 65 in 1910 to 2,023 in 1930. Additional prizes are awarded, by various bodies interested in the trade, on the results of tea tasting competitions held at the annual Grocers' Exhibition in London.

The local grocer.

Efforts to improve position of local grocer.

Such efforts equip the young grocer with knowledge that enables him, even when acting as a link in the chain by which proprietary articles are distributed, to exercise an expert judgment of their value, and may encourage him to make up and sell a special blend of his own.

“ Grocers’
blends.”

58. The needs of the grocer who desires to build up a business in non-proprietary blends are partly met by certain of the big blenders who in addition to their proprietary blends distribute a parallel but different range, known as “ grocers’ blends.” The blender sends samples to the grocer, who selects those which meet his requirements in flavour and price. The blender then supplies the selected blends in the required quantities in bulk, and may also supply a range of attractive bags or packets, printed with the local man’s name. To some extent this combines the merits of both the proprietary and the individual systems. In the buying, blending, and storing, the advantages of large scale operations are still available, but the grocer has the opportunity of choosing from a long range of samples, and of exercising his personal skill in selecting those of a quality and price best suited to local needs, and thus of building up local custom for a blend sold under his own name. A considerable trade is now being done on these lines.

Besides the competition between proprietary and grocers’ blends, there is now competition between the blends of large scale blenders supplied through individual retail traders, and blends put up by multiple-shop grocery companies and sold only in their own branches. As the multiple shops extend, the retail grocer expects to get a larger share of the sale of the blends supplied by the large blenders. He is, however, inclined to complain that his margin of profit on proprietary teas is very fine. This stimulates a few of the better equipped grocers to make and sell their own blends in the old way, and some who have made the experiment have found that it pays.

VI. TEA BLENDING

59. Practically no teas reach the consumer unblended. This practice of blending, besides being a prominent feature of the trade, has such influence on the manner in which teas are described at the time of retail sale that it is necessary to understand both the method adopted and the objective in view.

Tea tasting.

60. For several reasons the art of the tea taster plays an extremely important part in the trade. First, the palate must be the final test of value in tea, and in what is thus essentially a matter of taste, the taste of the expert has already had, and may have again, widespread economic implications. Secondly, tea as retailed is in almost all cases a blend of many varieties, in which one may give strength, another pungency, and another flavour, to the whole. Thirdly, teas vary so much between district and district and

between season and season that both the proportions and the constituents of a blend may need to be varied accordingly from time to time, and again, the effect of the consumer's local water supply on the infusion necessitates every blend being adapted to the water of the district in which it is to be sold. The activity of the tea-taster therefore may be directed to any of the following ends:—

(a) Judging samples before the sales, on behalf of brokers, or of garden managers, to report on the standard of quality and flavour, as between samples from different gardens or between samples of one season's crop and another from the same garden.

(b) Tasting teas for blending, after the sales.

(c) Tasting samples of a given blend to ensure uniformity of flavour with previous batches of the same blend.

(d) Tasting variations of a given blend introduced to ensure uniformity of price.

(e) Tasting variations of a given blend to adapt it to the waters of various districts.

61. The tea-taster has before him a row of little white china pots—in form rather like diminutive hot-water jugs—and in front of each a small china bowl, and a sample of the leaf to be tested in each pot. Into each pot is then placed an amount of leaf from each sample equal to the weight of a sixpenny piece (the traditional weight of the trade) or approximately $1/10$ of an ounce, and over it is poured water which has just come thoroughly to the boil; $\frac{1}{8}$ of a pint to each pot. The strength of this infusion is, it may be noted, considerably stronger than would be palatable for ordinary drinking. After five or six minutes—the time is carefully checked, in order to maintain uniformity—the infused liquor is strained into the bowls, and allowed to cool a little. The examination then begins. The taster takes a sip from each bowl, rolls it round his tongue, and spits it out. The empty pot is then inverted, and the infused leaf, which now rests upon the inverted lid, is examined for colour and scent. The infused leaf of fine quality tea is bright, and copper coloured: the poorer the quality the darker the leaf. As he goes along, the taster makes notes on paper. Each element, the appearance of the dry leaf of the sample, the colour and scent of the infused leaf, and above all the flavour of the "liquor," contributes to his final judgment.

62. In blending, the same process is taken a step further. After preliminary tasting, and trial combinations of one or two varieties in the mouth, the taster takes a varying number of teaspoonsful of one or more varieties from the bowls, puts them together in a fresh bowl, and tastes the blend. The process goes on until he is satisfied with the result, and as the strength of the original quantities is constant, the proportions of each constituent required to produce the blend in any quantity can easily be stated. It can

Tea
blending.

readily be understood that the discrimination of an experienced tea-taster is very fine indeed. His training takes several years and his services are highly valued.

63. The blender's skill and experience enable him, by taking a single sip of a blend, to decide whether he can pass it as equal to the blend tested a week before, but the purchaser, on the other hand, is almost certainly addicted to a particular blend, and the humblest housewife becomes an expert in her own favourite, which she tastes not once a week but four or five times a day, and is thus likely to detect any considerable variation in it. This helps to make the task of maintaining uniformity in a blend, from one year to another, both important and difficult.

64. The main ground for tea blending is simply the necessity of supplying a demand for tea of uniform quality at a stable price. While the use of the finest qualities mainly as constituents in blends in order to improve the flavour, means that only the few know and appreciate their special excellence, it nevertheless ensures that the great majority enjoy a better beverage than would be possible if the finest varieties were mainly sold as "straight" teas. By the art of the blender it may fairly be claimed that the public as a whole obtains a better article and the grower on the whole obtains a wider market. Nevertheless, the use of the comparatively small supply of fine tea in order to "blend off" with it tea of inferior quality offers for the latter a market which it might not secure on its merits.

The "filler." 65. "In regard to the low priced or common teas introduced for the purpose of reducing the cost of the blends," it is said* that "these teas will not contribute to the quality in any way, but, providing that the types selected are fresh, they will do it no harm." Thus is introduced into the blend an element known as the "filler" or "make-weight," which incidentally is the form in which foreign-grown teas usually find their way into the medium priced blends in the United Kingdom, competing with the commoner types of Indian and Ceylon growths. The fact that "it will not contribute to the quality in any way" enables the blender, by adding various proportions of the "filler," to reduce the cost price of the blend.

Provided that the blender does not over-do it to the extent of reducing too much the proportions of those teas which give flavour and quality to the blend, the change is not noticeable to the consumer. This use of the "filler" plays an important part in the month to month variation in proprietary blends, the quantity introduced varying with the price of the other teas. The blend may be constructed of teas which differ widely, or of teas which differ slightly. The "concertina" may be opened or closed according to the state of the market.

* F. W. F. Staveacre: *Tea and Tea Dealing*. p. 77.

There are two observations which may here be made. In the first place, the trade endeavours to keep the retail price of tea, particularly that of the widely advertised proprietary blends, as stable as possible, and a rise in wholesale prices may be passed on to the consumer by introducing just so much inferior material as will escape his notice—i.e. he gets a lower grade article at the old price. In the second place, high levels of wholesale prices are against the interests not only of the consumer but ultimately of the Empire producer also, since the foreign tea with which he has to compete is mostly of the "filler" type. One aim, therefore, of the Empire producer should be to keep the market abundantly supplied with good medium quality tea at a low price.

66. For supplying particular markets the blender must not only be guided by liquoring qualities and prices, but must also pay close attention to the appearance of the leaf. Thus for instance in the country districts of the Irish Free State, particularly in the South and West, there is a strong preference for "tippy" teas—teas, that is, containing a large proportion of the "tip" or bud of the plant, which in the dry leaf is easily distinguished by its bright or "golden" tint against the ordinary black leaf. To meet this demand exporters may pay a high price for tip, and this is reflected in the high prices at which the tea is retailed. In the country towns the consumers will pay up to 5s. 6d. and even small farmers will pay 3s. 6d. a pound for their tea, and there is little or no demand for cheap teas. Again, in some countries on the Continent of Europe, and also until recently in the United States of America, consumers purchased very largely on appearance, and preferred the whole leaf grades to the broken grades, although the latter yield a finer liquor. It has been brought to our notice that in the larger towns in the Irish Free State, and generally in the United States of America, there is a growing recognition of the importance of paying more attention to the liquoring quality of the tea than has been the custom in the past.

Catering
for special
markets.

67. The relation of blender and merchant to the trend of public taste is a double one: as experts in their merchandise they are the guides, and as salesmen they are the servants of their customers. The public in the United Kingdom has gradually been led to a preference for the Indian and Ceylon over the once universal China tea, and a similar movement has recently been taking place in the United States. It must not be forgotten that what has happened before may happen again, and that taste is fickle and even habit changeable. At the moment there are signs that public taste in the United Kingdom is moving towards the heavier bodied as against the clearer liquoring teas. The trend of public taste is clearly a matter which affects the grower as well as the merchant, and we therefore return to the subject in our observations on the organisation of research.

Need for
the
producer to
keep in
touch
with trend
of public
taste.

VII. CONSUMPTION OF TEA IN THE UNITED KINGDOM

Increased consumption of tea in United Kingdom in recent years.

68. In paragraph 39 we gave details of the quantities of tea retained in the United Kingdom in the years 1924, 1928 and 1929. These are not, however, the figures for the tea which passed into consumption in those years, as they take no account of variations in stock at the beginning and end of each year. As long as the United Kingdom duty on tea was in force, accurate figures for stocks were available, since tea was only cleared from bond shortly before being required for distribution. With the removal of the duty this facility to the trade disappeared, but the great bulk of the tea imported into the United Kingdom still passes through certain warehouses in London, and from the returns made by these warehouses the London Tea Brokers' Association publishes periodical figures of stocks from which estimates of total stocks in the country can be formed. In process of time the practice of using these warehouses may become less general, and there will be increasing uncertainty regarding the stock position. For the present, however, the customs returns up to the removal of the duty supply accurate figures both for stocks and for tea passed into consumption in the United Kingdom, and for 1929 an estimate can be formed. The consumption of tea in the United Kingdom in the six years 1924-29 was as follows:—

Consumption of Tea in the United Kingdom

	Amount in million lbs.	Increase per cent. on previous year
1924	395.5	2.2
1925	398.6	.8
1926	403.1	1.4
1927	409.9	1.6
1928	417.4	1.8
1929*	421.3	.9

* The estimate for 1929 is arrived at as follows:—

Total deliveries from warehouses	519,360,029 lbs.
Less Re-exports	95,022,790 "
	<u>424,337,239 "</u>
Less Re-exports under drawback, up to date of removal of duty	3,058,511 "
	<u>421,278,728 "</u>

Trade estimates for consumption appear to make no allowance for re-exports under drawback, which are included in the figure for total deliveries.

The annual increase per cent. has been fairly steady over the period, and it is possible that as the check in 1925—which followed the high rate of 1924—was followed by a reversion to a steadier rate in the next three years, the check in 1929 may also be followed by a similar return in the ensuing period.*

69. It is however important, in the case of a commodity of this kind, to take into account the figures for consumption per head, and to consider their implications. Since 1911 the figure has risen from 6.48 to 9.20 lbs. per head, an increase of over 40 per cent. in less than 20 years.

	Population in millions	Consumption in lbs. per head
1841	26.7	1.37
1891	37.8	5.36
1901	41.9	6.17
1911	45.2	6.48
1921	47.1	8.68
1928†	45.6	9.15
1929†	45.7	9.20

70. Some of the social changes which may have led to the increase in recent years can be suggested. There is, for example, the spread of the habit of taking an early morning cup of tea. There is the mid-morning cup of tea among domestic servants, shoppers and business women. There is the early afternoon cup of tea in offices. There is an increase of tea drinking among manual labourers, in the place of alcoholic beverages. There is also the more wasteful use of a commodity which is very cheap. The days when tea was carefully kept in a caddy under lock and key have long since passed away. More tea is brewed than is required and the residue is thrown away, and in spite of the custom of adding hot water for a second cup, a fresh "pot" is now made by many who some years ago would have manipulated the original brew.

71. On the other hand the factors just enumerated are all factors which have now been in operation for some time, and it is a question how long the present rate of increase can be continued. This becomes evident when one considers what the present figure of consumption means in liquid consumed. It is more economical to make tea for four or five persons than for one; and many know,

* Preliminary figures for 1930 suggest that this has occurred. Estimates based on deliveries from London warehouses (covering about 90 per cent. of the trade) point to a consumption of tea in the United Kingdom in 1930 of 432.6 million lbs.—an increase of 2.7 per cent. on the consumption in 1929.

† Excluding Irish Free State.

in a general way, that the better qualities are also economical as they go further, but perhaps because tea is so cheap, very few tea drinkers have any idea how many "cups" a pound of tea will provide, and even tea merchants may give widely divergent estimates if suddenly challenged. Those experts however who have given us a carefully considered estimate agree in the opinion that in domestic use some 180 to 200 cups will be provided by a pound of tea. On this basis, the present consumption figure means that the daily consumption of tea in the United Kingdom is now between $4\frac{1}{2}$ and 5 cups of tea per head of population.

Danger of prophecy in relation to increased consumption.

72. Prophecy in relation to future demand is always dangerous. Anyone who in 1911 had asserted that tea consumption in the United Kingdom would increase, in spite of the intervention of a world war, by over 40 per cent. in less than 20 years, would have been regarded as unduly optimistic. Yet the question naturally arises whether, with an average of nearly five cups of tea a day, a point is not being reached beyond which the increase is not likely to advance except in proportion to the increase of population, which at a rate of 250,000 a year would account for an annual increase in consumption of some 2,375,000 lbs. Moreover, though population is increasing it is increasing at a diminishing rate, and in the opinion of Sir George Newman (*On the State of the Public Health*, 1929, p. 13) the United Kingdom is "almost within sight of a stationary population."

Tendency to prefer better quality.

73. There may, however, be an expansion in values. Our own information confirms that obtained in the course of other enquiries, to the effect that there is only a very small demand for the cheapest varieties. The volume of the sale of blends at 1s. a pound is infinitesimal in comparison with that of blends at prices round about 2s. 4d., which amounts to over 50 per cent. of the total volume of tea sold. In thus preferring the better quality teas, consumers display a true economy, for not only do they obtain a superior beverage, but also by careful usage the better blends undoubtedly "go further" than the cheapest.

Need of cultivating other markets.

74. Tea is probably the cheapest drink in the world except water. We expect that the habit of tea drinking will continue to grow in the United Kingdom, but we have doubted whether, in the absence of some special stimulus—as, for instance, a permanent and substantial reduction in retail prices—the annual rate of increase noted for the years 1924-29, namely 1.5 per cent. per annum, can be maintained for many years more. Even if it were maintained for another 10 years, it would only require an additional 68 million lbs. of tea to satisfy—a figure which is well within the capacity of the present tea gardens to supply long before that period elapses. This consideration emphasises the need which we have already indicated for the tea producing industry to cultivate other markets as an outlet for future expansion.

VIII. THE COMPETITIVE POSITION IN THE UNITED KINGDOM MARKET

75. The principal competition which the Empire product now has to face is that of tea grown in the Netherlands East Indies. The net import of these teas into the United Kingdom has grown steadily and rapidly since the war, and the figure for 1929 is nearly $2\frac{1}{2}$ times that for 1919.

Growth of imports from the Netherlands East Indies.

Imports of Netherlands East Indian Tea retained in the United Kingdom

—	Amount in million lbs.	Duty in pence per lb.	Preference on Empire Tea
1913	29.1	5	Nil
1919	34.6	12 (a)	} Rebate of $\frac{1}{2}$ of full rate.
1920	36.6	12	
1921	33.2	12	
1922	34.1	8 (b)	
1923	29.6	8	
1924	49.6	4 (c)	
1925	42.4	4	
1926	54.6	4	
1927	64.8	4	
1928	60.6	4	
1929	75.0	— (d)	— (d)
1930	76.7 (e)	Nil	Nil

(a) Preference introduced on June 2.

(b) Duty reduced to 8d. on May 1.

(c) Duty reduced to 4d. on April 4.

(d) Duty removed on April 22.

(e) Provisional figure.

76. As we have already stated, the chief world markets for tea are found within the British Empire. When in 1919 a fiscal preference in favour of Empire grown teas was introduced into the United Kingdom, similar preferences were in force in all the principal parts of the British Empire except Australia, where at that time and until 1930 tea, if shipped in quantities exceeding 20 lbs., entered free of all duty. During the war the share of Java tea in the Australian market had been increasing. It is widely asserted in tea circles in London and Australia that one result of the introduction of preference in the United Kingdom in 1919 was to increase this foreign competition in the Australian market. The argument is as follows. A large proportion of the Netherlands East Indian crop is sold forward. With the introduction of preference in the United Kingdom the price of Netherlands East Indian teas was lowered to meet it. London, with its

United Kingdom preference and the Australian tea import.

preponderating import, is the centre of the world's tea trade, and sets the world price. Had the producers in the Netherlands East Indies attempted to quote higher prices to the Australian importers than their tea realised in London, those importers might have bought from bond in London, where stocks are always available. Consequently, in the absence of any customs preference in Australia, the United Kingdom preference led, in this case, to an undercutting of the price of Empire-grown teas in the Australian market. It is a fact that between 1920 and 1923 the share of Empire-grown tea in the Australian import fell from 55 to 31 per cent., and that of Netherlands East Indian tea rose from 42 to 60 per cent. In 1924, a year in which the United Kingdom duty was lowered and the preference *pro tanto* decreased, the reverse tendency began. In 1928 the Empire share of the Australian import had risen to 49 per cent., and in the eleven months January to November, 1929—the year in which the United Kingdom duty was removed—it reached 60 per cent., against 40 per cent. for the rival product. The chief gainer by this interesting recovery is Ceylon, which now once more occupies the first place with a share of 46 per cent.

These changes in the proportionate share of Empire and Java teas in the Australian market are set forth in the graph shown in Appendix F, from which the correlation which is considered to exist between those variations and the changes in the duty and preference in the United Kingdom, may be judged.

Point is given to the connection between the Australian import of Netherlands East Indian teas and the United Kingdom duty and preference, by the fact that similar variations have not occurred in New Zealand, where throughout the period under review teas grown in the Empire have enjoyed a preference of 2d. a pound. The total import has increased rapidly since the war, yet throughout the period the proportion of Empire grown teas—increasing from 90 to 98 per cent.—has amounted to a practical monopoly of the market.

Increased foreign imports in United Kingdom following reductions in duty.

77. Whatever part the changes in the preferential duty in the United Kingdom may have played in increasing or diminishing in Australia the competition of teas from Java with those grown in Empire countries, it is undoubtedly the case that from the time the preference in the United Kingdom was reduced in 1924 to two-thirds of a penny, the import of teas from Java in the United Kingdom definitely increased (see table in paragraph 75). Further, the year 1929, in which the duty was removed altogether, witnessed an exceptionally large increase in the net import of those teas—nearly 15 million lbs., an increase of practically 25 per cent. in one year.

High prices a stimulus to foreign competitor.

78. The more general cause, however, of the progress of Netherlands East Indian teas is the fact that until the fall of prices at the end of 1928 the market had for some five years been expanding and the general level of prices had been high. In these circum-

stances blenders sought and found additional sources of low grade teas in order to keep down the cost of their blend.

79. While a small proportion of Java tea competes in quality at certain seasons of the year, and Sumatra teas are finding a market on account of the evenness of their manufacture, the great bulk of these foreign teas are of a low grade useful mainly as a cheaper or make-weight—it is significant that they are never retailed by name in the United Kingdom—and buyers are not inclined to pay more than a comparatively low price for them. For this reason the better grade (and the greater part) of the Empire product can maintain its ground through superior quality. The Empire grown teas most affected are those produced in the less favoured districts such as Cachar and Sylhet in India and part of the low country in Ceylon (constituting from 15 to 20 per cent. of their respective sales in London) and the newer areas in Africa. When however there is a heavy increase of cheap foreign teas in the market, as occurred in 1929, the effect is to bring down much of the medium grades to the price level of the common teas.

Areas chiefly affected by the foreign competitor.

80. In so far as world demand since the war has led to an increased production of foreign tea, Empire producers, whose product is for the most part a superior article and at its best the finest in the world, have no ground for complaint, and so long as they maintain the quality and combine to extend the sale of their teas in new and developing markets, they should on a long view have little cause for anxiety.

Consumer often unable to distinguish Empire product.

In the United Kingdom, however, which is at once the greatest market and the one nearest the limit of expansion, they have some cause for anxiety and some ground for complaint.

The cause for anxiety is the rapid progress in the United Kingdom market of Netherlands East Indian teas to which we have referred in the preceding paragraphs. So far, as was pointed out in paragraph 43, this has not materially affected the percentage share of Empire-grown tea, partly because the import of China tea has been declining, but mainly because the total import has been increasing. The future outlook, however, is uncertain. First, there is reason to doubt whether the great increase of consumption in the United Kingdom can continue at the same rate as in recent years. Secondly, as we have been informed on good authority, the production of tea in Sumatra in the next five years may increase by some 50 million lbs. Thirdly, as the tendency now is for the whole of the surplus export of Java and Sumatra tea to be thrown on the United Kingdom market, this expanding production in Sumatra threatens that market with a glut of low-grade tea such as that already experienced in 1929. Producers in the Empire—especially in India—therefore view the future with some alarm. They are making efforts to open up new markets and we recommend later in our report that those efforts should be

increased. Nevertheless, their great staple market is in the United Kingdom, and it will be many years before their gains elsewhere can compensate for losses in the United Kingdom which is not only their chief market, but one in which they have built up a goodwill.

A ground for complaint is that the consumer is kept in ignorance of the origin of the teas used in the blends which he buys. Not only is the consumer kept ignorant of the presence of Java and Sumatra tea in the blends in which they are used, but even in the many cases in which the blend consists entirely of Empire produce, there is often no indication of the fact. The consumer is thus deprived of the opportunity of exercising a voluntary preference and the retailer of the opportunity of catering for it.

81. The consumer may further be misled by the equivocal sense of trade descriptions which employ the word "blend" preceded by an epithet of origin. While the consumer most probably understands such a term as "Indian blend" to denote a blend which is composed of various Indian teas, the dealer may be using it to denote a blend of which only a proportion consists of Indian teas. Individual dealers may be more explicit in their catalogues, but the general ambiguity remains a source of confusion.

Application
for a
Marking
Order.

82. In the autumn of 1928 the Indian and Ceylon Associations in London sought to have removed these anomalies which they held were detrimental to their trade. For that purpose they applied for a Marking Order under the Merchandise Marks Act of 1926. The Standing Committee which considered the application reported that the practical difficulties inherent in the enforcement of a compulsory Marking Order for Tea were such that they could not recommend it. At the same time the Committee added that they desired to make it clear that "*the wishes of the public could only properly be tested if they were in practice able to distinguish the origin of the tea*" they purchase.

Voluntary
declaration
of origin.

83. There is, however, a great difference between a compulsory Marking Order and a concerted effort, on a voluntary basis, to supply the public with pure Empire blends and to bring home to the consumer the existence of those that are already obtainable and where they can be obtained. Both among retailers and among certain of the large blending houses there is, we believe, already a willingness to assist in any practicable scheme, and with good will all round we are confident a remedy can be found for the present anomalous state of affairs. In this connection we make the following recommendations.

84. In promoting the sale of other Empire produce the Empire Marketing Board has been particularly successful in enlisting the co-operation of the distributive trades and in working along lines which have won their confidence, and in this instance the Board may be of service as an intermediary in restoring unity of aim

between producers and distributors, as well as by taking the initiative in the necessary publicity.

(1) First, we suggest that the Board might compile for free distribution a list of such blends, consisting entirely of Empire-grown teas, as are already obtainable. This list would necessarily be extended from time to time. Suggestions for encouraging voluntary declaration.

(2) Secondly, we suggest that in conjunction with the Empire tea producers' organisations, a series of substantial prizes for blends of Empire Teas might be awarded at trade exhibitions, such as the annual Grocers' Exhibition in London and the British Industries Fair, to be severally competed for by assistant grocers, master grocers, single-shop retailers, and blenders of proprietary blends. Part of the prize in each case would be a symbolic emblem which could be displayed by the successful competitor.

(3) Thirdly, we suggest that the Board might issue shop-window or counter show-cards and posters, announcing that pure Empire blends are obtainable, to those retailers who furnish the Board with a declaration that they have regularly on sale blends consisting entirely of Empire tea, whether these are their own blends or proprietary blends which carry a similar declaration.

85. Tea, owing to the superiority of the Empire product, is a particularly favourable subject for voluntary preference and offers to those who cater for that preference an exceptional opportunity for developing their trade in what is one of the staple articles of their business. There can be no reason but mere oversight for the fact that a well-known London store, which prides itself on its display of Empire products, should distinguish its various blends by nothing but a series of numbers, with the sole exception of China tea, which is given a distinctively coloured package and a bold mark of origin. To the same reason may also be assigned the fact that a well-known multiple-shop organisation, which for some time has put up a thoroughly good household blend consisting entirely of Empire-grown tea (which now sells at 2s.) should have only in the last few months attempted to exploit the publicity value of the Empire origin and does not even yet exploit this publicity value on the packet itself. Opportunity for distributors.

86. For there is no doubt that, providing the article is good, the declaration that it is the produce of the British Empire now has definite publicity value in the United Kingdom—very largely owing to the work of the Empire Marketing Board. Nor does such a declaration in any way detract from the special goodwill of a proprietary blend. Rather, it is an additional selling point, and one with a steadily increasing value, which here remains to be exploited by those who have vision and enterprise. Nor does this apply to proprietary blends only. In the case of the small grocer who is aiming at establishing a reputation for a blend sold

under his own name—and every grocer knows how valuable that can be—there is a great opportunity for the man who concentrates on the Empire-grown article.

Ample supply of tea for pure Empire blends of competitive quality.

87. There is one prior condition—a condition which we have consistently emphasised in our Reports—the article must be good. We have carefully considered the question of the price at which a pure Empire blend, of a quality that will maintain and promote the high reputation of the Empire product, can be retailed. We are satisfied that for 2s. a pound a thoroughly good household blend of Empire-grown tea can be retailed, and that from 2s. 4d.* onwards it is possible to retail higher grade blends of Empire-grown tea which will successfully compete in quality with any blends, at the same prices, which contain foreign teas. To the fear of some blenders that it may be difficult to maintain uniformity all the year round without the admixture of foreign teas as “fillers,” two answers may fairly be made. First, it can be done, because in many cases it is already being done, although, as the consumer is so often not made aware of the fact, both he and the retailer are the losers by this “shopping in the dark.” Secondly, while in other sections of our Report we have not under-rated either the task or the skill of the large-scale blender, we consider that when, in the face of a net import in the United Kingdom of 380 million lbs. of Empire-grown tea, any blender professes to be unable to maintain a pure Empire blend at these prices, he unwittingly pays himself a very poor compliment.

IX. WHOLESALE PRICES, 1922-1930

The slump in 1920.

88. It is a matter of common knowledge that the end of the year 1929 found the United Kingdom market over-supplied with tea, and prices declining to a point at which the less favoured producers were selling below cost. As it is not the first time since the war that this has occurred, it may be advisable to glance first at the situation which arose in 1920.

Apart from the coming into bearing of new areas, a sudden increase in tea production may be due to one of two causes, or both. Exceptionally favourable weather conditions may produce a bumper crop, or expanding markets and rising prices may induce garden managers to pluck more coarsely and so increase their output. During and immediately after the war, the latter was the principal factor. Demand for tea was great, and markets indiscriminating—prices being “controlled” in 1917 and 1918. Control of prices was removed in 1919 and heavy exports (particularly from Java and Sumatra) in 1919 and the early part of 1920 included much that was the result of coarse plucking and, as such, inferior in quality.

* The retail prices quoted are those ruling in the Autumn of 1930.

In addition, large stocks held in London under Government control were unloaded on the market in 1920 as well as stocks that had accumulated at ports of shipment owing to lack of shipping facilities. It is customary for the wholesale prices of tea to rise during the autumn when the new Northern Indian crop comes to market. In 1920 that normal rise did not occur. Instead, wholesale prices of common tea fell steadily from 15½d. a lb. in February to 5d. a lb. in December. To match that low price it was necessary to go back to 1908. In consequence, producers, including those in Java and Sumatra, agreed in the autumn of 1920 to restrict their crop severely for a season—a course, be it noted, that certain of the distributors in the United Kingdom themselves recommended as an urgent necessity. By means of this temporary restriction, aided by unfavourable weather conditions, accumulated stocks were reduced. Prices ruled very low throughout 1921, but there was a small rise in the autumn, and this was followed by a general and steady recovery. Although the practice of coarse plucking which had grown up under war conditions and Government control of the market still remained a temptation in times of high prices, the lesson of 1919-20 was not forgotten, and planters everywhere, but especially in Ceylon, now realised the advantage of paying more attention to the quality as well as to the quantity of their product.

89. From 1923 to 1927, prices were good, reaching high levels in 1924, 1926 and 1927. In 1928 a decline set in, and in 1929 prices fell away still further. In April of that year the whole of the duty (4d. on foreign-grown and 3½d. on Empire-grown tea) was removed. Producers and merchants alike expected a fresh increase in the demand for tea in the United Kingdom. Moreover, weather conditions in Northern India had been favourable and the supply of labour comparatively plentiful. How far, if at all, a return to coarser plucking contributed to the increase in crop is uncertain, but the surplus, on this as on other occasions, was directed to the United Kingdom, including supplies of Java tea diverted from Australia. Consumption in the United Kingdom did increase, but at a diminished rate, and the increase was more than counterbalanced by the increase in stocks. A general depression in trade became marked, and the experience of 1920 was repeated in that tea prices entirely failed to recover during the autumn, and in fact fell steadily.

The slump
in 1929.

90. Average annual wholesale prices in London of teas of different origin and for "all tea" from 1922 onwards are given in Appendix C, Table I. In the table in this paragraph, the same prices are shown in Index Number form, with those of 1923 equal to 100. The year 1923 has been adopted as "standard" not because prices in that year were "normal" but because prices in 1922 were still affected by the slump in the previous year. Figures

Price index
numbers,
1922-1930.

are also given for Indian Common Broken Pekoe Souchong, since this grade is regarded in the market as typical of the cheaper teas. It forms about 10 to 15 per cent. of the total Indian crop, and at least 40 per cent. of the Java tea is of similar or lower grade. Prices of this grade of tea fluctuate more rapidly than those of the better grades. In times of scarcity the price of this Common Broken Pekoe Souchong goes up first; in times of glut it comes down first; and in both cases it swings further than the prices of the better qualities, which follow the movement. In a prolonged slump it drags down with it the prices of the lower medium teas. Thus the "market" regards the price record of this grade as a barometer of the general tendency of prices for all teas.

Average annual wholesale prices 1922-1930

	North India	South India	Ceylon	Nyasaland	Java	Sumatra	Indian Common Broken P.S.	All tea
Average price pence per lb.) 1923	d. 18·76	d. 18·14	d. 19·38	d. 16·34	d. 14·94	d. 16·45	d. 16·86	d. 18·69
Prices in 1923=100								
1922 (a)	82	77	82	66	68	68	78	81
1923	100	100	100	100	100	100	100	100
1924 (b)	106	105	107	101	103	109	104	106
1925	94	97	104	81	86	101	85	96
1926	103	105	105	106	106	99	96	104
1927	101	104	107	93	92	97	90	102
1928	88	85	98	81	84	85	73	90
1929 (c)	84	85	98	75	81	84	65	87
1930	78	80	96	58	68	68	53	81

(a) Duty reduced from 1s. to 8d. on May 1.

(b) Duty reduced from 8d. to 4d. on April 4.

(c) Duty removed on April 22.

Compara-
tive
steadiness
of better
qualities.

91. It will be seen from the foregoing table that during those nine years the average annual wholesale prices of "all tea" have fluctuated within a range of 25 per cent. of the average price prevailing in 1923. For Java tea and for Indian Common Broken Pekoe Souchong these ranges open out to 39 per cent. and 51 per cent. respectively. On the other hand the fluctuations in the annual average prices of Ceylon tea have not only been less severe from year to year but also more restricted in total range—25 per cent.

Ceylon tea is not only of high average quality, but also possesses a characteristic flavour and "body" which are valuable constituents in a blend. Production, though large, is less than in India. Ceylon teas are therefore more resistant to falling prices.

92. It must not be overlooked that these index numbers are based on the average of all the prices obtained in the sales. Such an average necessarily conceals differences, which in the case of tea are very marked. Certain "breaks" of outstanding quality may fetch a high price, and raise the general average, though many will be below it. Thus in a week in September, 1929, when the district average of Darjeeling was 1s. 11½d. the average of one particular garden was as high as 6s. 8½d. while several were under 1s. 6d. and the lowest was under 1s. 1d. Further, while the average from any particular garden on one day in the sales might be 1s. 2d., it would be made up of prices for the different grades of tea from that garden which might run from 2s. down to 10d. None the less the figures in the table in paragraph 90 show the general course of prices. In 1928 they were all pointing downwards. Throughout 1929 Ceylon alone maintained its 1928 average. All the others were lower. The course of prices for common tea during the autumn of 1929 were specially significant. By December, 1929, they had fallen to 8½d. a lb. as compared with 7½d. a lb. in December, 1913—a rise of only 10 per cent. over pre-war rates, which was clearly insufficient to cover the increase in the costs of production, transport, storage and marketing since those days.

93. Nor did the stock position hold out any hope that the depression had reached its limit. In fact stocks in London were increasing. They were heavier at the opening of the season of 1928 than they were at that of 1927, and were still heavier at the opening of the 1929 season. This is clear from the following table, which is based on the published returns of the London Warehouses, where about 90 per cent. of the tea in stock in the United Kingdom is stored. The stock position.

Stocks in London Warehouses on 30th June in thousand pounds

—	1927	1928	1929	Percentage change 1929 over 1927 + denotes increase — denotes decrease
India	62,437	89,625	102,109	+ 64
Ceylon	31,943	39,080	41,274	+ 29
Java and Sumatra	20,348	24,916	32,955	+ 62
China	11,114	7,732	7,554	— 32
African and Sundry	446	429	685	+ 54
	126,288	161,782	184,577	+ 46

Except for China tea, the increases in stock were generally heavy and notably so in the case of Indian and also Java and Sumatra teas.

Cachar and
Sylhet.

94. With most primary products it is the poorer qualities which, during a slump, prove most difficult to sell and consequently tend to hang over the market. The table of price variations in paragraph 90 indicates that this has happened in the tea market. In 1929 and again in 1930 the fall in the price of Indian Common Broken Pekoe Souchong has been notably greater than that in the price of "all tea," showing either that the arrivals of common tea have been so largely increased as to drive the price of that grade out of step with those of other grades of tea or that with lower prices all round buyers have turned their demand to the somewhat better grades. The second of these alternatives appears to have operated. The bulk of the common Indian Teas come from Cachar and Sylhet and the figures of total production for these districts (set out in Appendix A) show no appreciable change in any of the three years 1927, 1928 or 1929. Further the number of packages of tea from these districts sold in London during the last three years has decreased—thus :—

Cachar and Sylhet Tea sold in London

Season	No. of Packages.	Million lbs.
1927-28	392,839	46.4
1928-29	378,474	44.6
1929-30	382,651	45.2

The sales of these teas have thus fallen by over one million lbs. In contrast with this the quantities sold in London of Assam and Southern Indian tea have increased over the same period by 21 million lbs.

Java.

95. The other source of low grade tea is Java. The detailed figures given in Appendix C, Table III, show that even after payment of duties the average cost to the London buyer of Java tea was consistently below that of Indian Common Broken Pekoe Souchong until 1929 and 1930. Thus, in 1928 the average cost (wholesale price plus duty) of Java tea was 1.04d. per lb. below that (wholesale price plus duty) of this common Indian grade. In 1929 it was 1.88d. per lb. above it. In 1930 the difference fell to 1.10d. per lb. in favour of Java. This change in relative values is not ascribable to any one cause. The rapid change in relative values might be due to very marked improvements in the general quality of Java tea shipped to the United Kingdom, or to less of the poorer qualities being sold, with the corollary that they have gone into stock.* The average quality of tea shipped from Java in 1929 and 1930 has improved, owing to greater care in manufacture, to the

* Cp. paragraph 101 below, and Appendix B.

diversion to London of tea formerly shipped to Australia, and to a certain reduction in the shipments of very poor tea. The low prices obtained for the poor teas in the autumn of 1928 had already forced the Java producers to exercise greater care in plucking and checked to some extent the quantities of low grade leaf which in the previous years of higher prices had been offered for sale in London. Although all these causes operated, they are insufficient in themselves to account for a change of 3d. a lb. in average prices in one year. The inference is that a large part of the 62 per cent. increase in stocks in Java tea at the end of June 1929 consisted of the poorest qualities, which in times of higher general wholesale prices are, as we have already explained, largely used in blends as "fillers."

96. Although in 1929 and 1930 the market demand at the then prevailing prices seems to have turned toward the medium quality, and away from the poorest quality teas, the accumulation of stocks was none the less a menace to all the producing interests, except those possessing teas of special quality in limited supply. By the end of December, 1929, total stocks of tea in London represented 6½ months' supply—the highest figure for stocks at the end of December for 30 years and possibly the highest then known. As many Java teas begin to lose their flavour after three to four months' storage and many Indian after seven to nine months' storage, this figure was ominous. It meant a dead weight on the market pressing down the prices of practically all teas—certainly of those in the medium grades.

Over six months' supply in London.

97. An idea of the effect of the fall in prices in 1928 and 1929 on the earnings of Ceylon and Indian tea companies can be formed from the following tables extracted from statistics published regularly in London in regard to 65 tea Companies in India and 34 in Ceylon, the shares of which are quoted on the London Tea Share Exchange. Although these 99 Companies by no means cover the whole Indian and Ceylon tea industry, they nevertheless include many of the large companies.

Effect of fall in prices on earnings of producers.

(A)* *Profit per acre of 65 Indian Tea Companies*

—	1913	1924	1928	1929
Average Profit per mature acre	£6 10s. 7d.	£15 2s. 0d.	£10 0s. 0d.	£6 9s. 0d.
Average Profit in pence per lb.	2.6	6.4	3.84	2.26
Average Crop per mature acre	599 lbs.	560 lbs.	625 lbs.	684 lbs.

It will be noted that in spite of increased output per acre the average profit per mature acre was less in 1929 than in 1913.

The following table indicates the manner in which the shrinkage in earnings in 1928 and 1929 affected different districts. All were affected, but those producing the poorer teas, especially Cachar and Sylhet, by far the most severely.

(B)* *Earnings (less depreciation and fixed rentals) of 65 Indian and 34 Ceylon Tea Companies*

District	Number of Companies	Earnings in thousands of £			Percentage Decrease on 1927	
		1927	1928	1929	1928	1929
Ceylon	34	1,071	1,019	1,021	5	5
Darjeeling	4	120	111	113	8	6
South India	1	441	379	278	14	37
Assam	29	1,693	1,470	1,008	13	40
Dooars	9	611	298	280	51	54
Mixed Districts (India)†	10	1,385	848	402	39	71
Cachar and Sylhet	12	108	39	25 (loss)	64	123
Total India	65	4,358	3,145	2,056	28	53

† All the companies in this group own some gardens in Cachar and Sylhet or in the Dooars.

* Table A is based on figures issued by the London Tea Share Exchange, and Table B on figures published in De Zoete and Gordon's *Tea and Coffee Producing Companies*, 1930.

X. THE RESTRICTION SCHEME

Agreement to restrict 1930 crop.

98. Faced with the position as it was developing in the autumn of 1929, a Committee of the several Associations representing growers in India, Ceylon, Java and Sumatra discussed the possibilities of an agreement to restrict output during the following year. In the early months of 1930 agreement was reached. The scheme adopted, though less drastic than that of 1920, none the less aimed at reducing by 57½ million lbs. the total output from all the areas concerned.

99. For India and Ceylon the degree of restriction to be undertaken varied according to the quality of tea produced, being greater for the lower qualities than for the finer. The scale was as follows : The scheme.

(a) Estates whose teas sold below an average for 1926-27-28 of 1s. 5d. per lb., London gross sale prices, or the equivalent, to limit output to 85 per cent. of the 1929 crop.

(b) Estates whose teas sold below an average, on the same basis, of 1s. 7d. but not below 1s. 5d. per lb., to limit output to 90 per cent. of the 1929 crop.

(c) Estates whose teas sold below an average, on the same basis, of 1s. 9d. per lb. but not below 1s. 7d. per lb., to limit output to 95 per cent. of the 1929 crop.

(d) Estates whose teas sold at above an average, on the same basis, of 1s. 9d. per lb., to limit output to 97 per cent. of the 1929 crop.

(e) Limitation should not bring the 1930 crop below 400 lbs. per acre on any estate, and estates which in 1929 did not yield more than 400 lbs. per acre need not limit output.

(f) Special consideration to be given for new estates (five years or under) and estates damaged by hail or flood.

The scheme for the plantations in the Netherlands East Indies was similar, the undertaking being to reduce the total output, including that of new areas just coming into bearing, by 10 million lbs. To effect this, the restriction in old areas would in some cases be more drastic in order to allow for those just coming into bearing, and considerable reduction was expected in the amount of "bought leaf"—leaf, that is, which is produced by native growers and bought by the estates for manufacture in their factories.

100. The manner in which the restriction was to be effected was not prescribed. It might be effected in several ways, e.g. : Methods of restriction.

(a) Finer plucking might be introduced, i.e., fine instead of medium, medium instead of coarse.

(b) Part of an estate might be left out of the plucking area.

(c) Companies owning several estates might confine the restriction to certain estates, and leave others unrestricted, so long as the total restriction satisfied the requirements of the agreement.

(d) Manuring might be reduced.

101. The Restriction Scheme was regarded by many as a regrettable and temporary expedient which could only be accepted from sheer necessity, and was, in fact, only accepted for the period of one crop. It will be noted that it endeavoured to avoid restriction of the finest teas, as some of the estates which produce them come within the provision concerning yields of less than Position at the end of 1930.

400 lbs. an acre, and companies producing varying grades might be expected to confine restriction to their lower qualities. When in 1920-21 restriction was previously enforced, the price of common tea remained low during 1921 but showed in the autumn of that year the customary rise. Similarly on the present occasion the price of common tea remained low during 1930, the monthly average being consistently lower than that prevailing for the corresponding month in 1929, and total stocks in London showed no decline on the year's working, as an increase of 7 million lbs. in the stocks of Java and Sumatra teas more than counterbalanced the decline of those of Indian and Ceylon teas.* Provisional figures indicate that the total exports from Java and Sumatra in 1930 were less than 3 million lbs. below those in 1929, instead of the ten million lbs. reduction which it was anticipated would result from the Restriction Scheme. Exports from India and Ceylon were reduced by 38 million lbs., as against the 47½ million lbs. anticipated, although in India the actual crop reduction was greater than was expected. The total exports from these four countries were thus reduced by 41 million lbs. instead of the 57½ million lbs. hoped for. This failure to realize expectations was attributed to a slackening of local demand in India and to the shipment of uncontrolled "native" tea from Java by Chinese merchants. At the close of 1930 negotiations were in progress to continue restriction during 1931, on a revised basis.

Restriction
a temporary
expedient.

102. The immediate object of restriction is to allow time for surplus stock to be absorbed by the market. It certainly prevents the complete disorganisation of the trade which would result from the despatch of large supplies to an already congested market, but in averting this evil the more prosperous companies exercise restraint to preserve the weaker ones, and although the life of a weaker company may thus be prolonged, it cannot be permanently preserved if the improvement resulting from finer plucking is insufficient to counterbalance the overhead costs per pound due to the reduced output. It thus becomes a temporary measure to meet a temporary difficulty. Restriction in tea differs from that in other commodities, such as rubber, in that it can be so applied as to improve quality. If it could be universally applied by means of finer plucking—thus producing a better article—there could be no economic or other objection to the process. Really fine plucking, however, i.e., plucking confined to two leaves and a bud, requires an adequate labour force, for it presupposes that each plucking round is completed before the new flush is far forward, and may also involve a reduction in bonus to labour, which is not popular. It is doubtful whether restriction can be so applied by gardens which produce mainly lower grade teas. Some of these gardens may be driven to restrict in other ways. Wherever

* See Appendix B.

restriction is carried out, not by means of finer plucking but by leaving a portion of the estate out of the plucking round, there is no guarantee of improved quality, and the area so left remains a still heavier potential producer in the next season. Further, restriction of output from existing plantations cannot in itself prevent the development of new plantations, either in areas that come within the scheme or in areas that lie outside it. In India some 80,000 acres have been planted in 1925-28, and are steadily coming into bearing. In Java production may have reached its peak, as there is very little, if any, suitable land available for expansion, but in Sumatra the possibilities of great and rapid expansion are limited only by the present scarcity of labour. As we have already stated, tea cultivation is already extending in Kenya and Nyasaland. It is estimated that the newly planted areas in India, Sumatra, and Africa are capable of yielding in the course of a few years upwards of another 100 million lbs. Thus, as is recognized, the restriction scheme is a desperate remedy to meet the present emergency. At the best, it is a palliative, not a cure, and the continued prosperity of the tea industry as a whole depends on increased consumption and the development of greater world markets.

XI.—RETAIL PRICES, 1922-1930

103. Among world markets the United Kingdom stands by itself. We have already measured the rate of expansion in that market, over the years 1924-29, at 1.5 per cent. per annum, but have not yet considered the conditions in the retail market under which this expansion took place. In paragraphs 90 to 96 the course of prices since 1922 has been examined from the producer's point of view—the prices realised at auction. The purchaser at auction, however, bought subject to the liability of paying duty at the appropriate rate when he removed the tea from bond. Thus the cost to the buyer was wholesale price *plus* duty. Retail
Index
Numbers,
1922-1930.

In Appendix C, Tables II and III, are set out both the average annual duties on teas of different origin and also the wholesale costs of those teas (wholesale price *plus* duty) to a buyer. In the table in this paragraph these average annual costs are shown in Index Number form, all costs being referred to those of 1923 as standard.

Two columns have been added to the table. One gives the index numbers of the average retail prices of tea based on the Ministry of Labour's figures (those of 1923 = 100). The other column gives the difference in pence per lb. between those average retail prices and the average costs of "all tea."

Average Annual Wholesale Prices, plus Duty, and Average Retail Prices, with Differences between Retail Prices and the cost (including duty) of "All Tea," 1922 to 1930.

	Northern India	Southern India	Ceylon	Nyasaland	Java	Sumatra	Indian Common Broken P.S.	All Tea	Retail Prices Min. of Lab.	Difference in pence per lb. between retail and "all tea"
Average cost in pence per lb. 1923	d. 25.42	d. 24.80	d. 26.04	d. 23.00	d. 22.94	d. 24.45	d. 23.52	d. 25.62	d. 30.50	d. 4.88
	Average cost in 1923 = 100									
1922 (a)	92	88	90	80	85	85	89	91	93.0	5.24
1923	100	100	100	100	100	100	100	100	100.0	4.88
1924 (b)	96	95	96	91	92	96	93	95	94.5	4.28
1925	83	84	90	72	73	84	75	84	96.0	7.73
1926	89	90	91	90	87	83	86	89	96.0	6.54
1927	88	90	93	81	77	82	78	88	94.0	6.12
1928	78	76	86	72	72	73	75	79	94.5	8.50
1929 (c)	66	67	77	58	59	61	50	68	83.0	7.92
1930	58	59	71	41	45	46	38	59	78.0	8.51

- (a) Duty reduced from 1s. to 8d. on May 1.
 (b) Duty reduced from 8d. to 4d. on April 4.
 (c) Duty removed on April 22.

Effect of reduction and abolition of duty.

104. The table of index numbers of costs to the buyer is in marked contrast with that of wholesale prices given in paragraph 90. This is due of course to the successive reductions in duty since 1922, resulting in its total abolition in April, 1929. These reductions of duty have been sufficient to counterbalance the rises in wholesale prices when such have occurred. In 1924, 1926, and 1927, the average prices of "all tea" were above those prevailing in 1923 (see table in paragraph 90), yet in these years, owing to reductions in duty, the cost of tea to the wholesale buyer was less than in 1923 (see table in paragraph 103). A comparison of the index numbers for "all tea" in these two tables shows that while between 1923 and 1930 the average wholesale price for "all tea" fell by 19 per cent., the cost to the buyer fell by 41 per cent.

The abolition of the duty in 1929 entailed the disappearance of the preference which the Empire producer had enjoyed. In consequence the price factor in the competition with Java teas has inevitably been rendered more potent. For instance, both in 1921 and 1930 the average price for Java tea in Mincing Lane was approximately 4½d. below that for Northern Indian tea, but in 1921, owing to the duty on Java tea being higher by 2d. a lb. (1s. as against 10d. for Empire grown tea) the cost to the whole-

sale buyer in 1921 was only 2½d. below that for Northern Indian tea, whereas in 1930 it was the full 4½d. a lb.

105. The table in paragraph 103 further shows that the fall in retail prices has not been commensurate with that in wholesale cost. The margins between the average retail prices (Ministry of Labour's figures) and the average cost (wholesale price plus duty) of "all tea" have widened from somewhat under 5d. a pound between 1922 and 1924 to over 8d. a pound between 1928 and 1930. It is probable that these figures understate the true margins, for it has to be remembered that in the averages of the wholesale cost of "all tea" the cost of the most expensive qualities are included, although in all probability little of those enter the blends the sale prices of which are recorded by the Ministry. These margins do not measure profits. They have to cover the cost of a multiplicity of services such as blending, packing, and distribution, as well as the cost of advertising, before the packet of tea is handed over the counter. Moreover the distributors of proprietary packet teas undoubtedly endeavour to keep their retail prices as steady as possible over long periods of time, and some consider it impolitic to alter the price by less than 4d. at a time, in order to have an even price for the quarter pound packet. In this connection it will be noticed from the table in paragraph 103 that in the years 1923 and 1924 retail prices did not rise equally with the cost of tea. With fluctuating wholesale prices, this practice of averaging must result in the margin left as profit being small at times of high wholesale prices, the distributor looking to recoup himself when wholesale prices fall. It would not be remarkable, but natural, if at a time of rapidly falling wholesale prices he hesitated to establish lower levels for retail prices through fear lest in a few months wholesale prices might more than regain what they had lost. Past experience furnished him with ground for such fears. Thus during the great slump in 1921 the wholesale price of common tea fell to 5d. a lb., but two years later it had risen to 1s. 4½d. a lb. Stability in retail prices and close correlation between retail and wholesale prices are, in such circumstances, contradictory.

Reductions
in Retail
Prices not
com-
mensurate.

106. Further, the practice of blending affords an opportunity, at times of low wholesale prices, to increase the percentage of the better qualities of tea in the packet without alteration of its retail price.

It is impossible without expert knowledge or information to check this, though in paragraphs 94 and 96 we have given reasons for surmising that in 1929 and 1930 poorer qualities of tea were neglected on the market. The competition between the big blenders tends to become in fact a competition in quality rather than in price.

None the less, with the lower prices prevailing in 1929 distributors introduced a blend selling retail at one shilling a pound. At first

the public response was not encouraging, but in the latter part of 1930 sales, especially in the North, increased. This, however, does not alter the fact that the main demand from the general public is for the medium priced blends.

In 1930 the reintroduction of the gift or coupon system, especially in the North of England, indicated that retail prices might be reduced. It is true that, so far as the cost of such "gifts" does not merely represent the diversion of funds from one form of advertisement to another, they operate as substitutes for reductions which might be possible in the retail price. They have, however, the great disadvantage of distracting the attention of the purchaser from the quality and price of the article sold, to the attractiveness of the "gift" offered.

The general public have benefited by substantial reductions in retail prices of tea, by the introduction of cheaper grades, by the receipts of "gifts" for which they pay in the price charged for the tea they buy. None the less the margin between wholesale and retail prices appeared to be definitely greater in September, 1930, than in 1926.

The Food
Council on
Retail
Prices.

107. In 1926 the Food Council of the United Kingdom enquired into the rise in wholesale tea which occurred in the autumn of the previous year. In their report the Council drew attention to the comparative steadiness in retail prices, and reported that:—

"Whilst the wholesale price of tea has fluctuated very greatly in the last 18 months average retail prices have been steady, the effect of rises in the wholesale price being confined to the withdrawal by some firms from the market of their cheapest brands, the consumption of which is comparatively small. The steadiness of retail prices may be due either to competition between distributing companies or to stabilisation of the retail price at an unduly high level. We are unable to indicate in this report which of these two causes is the true one, since the enquiry has been confined to wholesale tea prices, but the margin of profit obtained by retail distributing companies might well form the subject of further enquiry by us."*

XII. MARKET EXPANSION

The United
Kingdom
Market.

108. Between 1923 and 1930 average retail prices of tea have fallen by 22 per cent. (Appendix C). During the period 1924-1929, the consumption of tea in the United Kingdom has been increasing, as we have noted in paragraph 74, at the rate of 1.5 per cent. per annum. It is possible that had the fall been greater the rate of expansion might have been higher, and if prices are now definitely

* In reply to a question whether the retail price charged for tea reflects the reductions in the wholesale price of tea, the President of the Board of Trade stated in Parliament on 9th December, 1930, that he was asking for a report from the Food Council on that question.

established at lower levels it is likely that the present rate may be maintained or even for a year or two enhanced, but in paragraphs 71 to 74 we have given reasons for doubting whether a much higher rate can be expected over a term of years.

In view of the existing capacity for a largely increased output from the tea gardens of the world—both those now in bearing and those recently opened—it is, in our opinion, essential for the permanent well being of the industry that possible markets in other countries should be systematically cultivated.

109. In Appendix D. we give the estimated total and per capita consumption for 36 countries. The figures in that Appendix show great variations in consumption. In Australia, in the Irish Free State, in New Zealand, annual consumption is already about 8 lbs. per head. In contrast, the consumption in the United States is less than 1 lb. per head, although across the Northern frontier lies Canada with a consumption approaching 5 lbs. per head. Among other countries with large populations in which tea drinking has already made some progress are Russia, with an annual consumption of a third of a pound per head, and India, with less than one fifth of a pound per head. Great possibilities surely exist in these three countries of immense population for extending the use of tea.

Dominion
and foreign
markets.

110. The United States is the second largest importer of tea in the world. Yet when the great size of that country is considered, this fact is rather an indication of possibilities than a subject of satisfaction to tea producers. As a land of coffee drinkers the United States still comes a very long way after the United Kingdom in the consumption of tea. With a population three times as large, tea consumption is less than a quarter that of the United Kingdom. An even more illuminating comparison is that with Canada, given in the preceding paragraph. The difference is so striking that it cannot be explained solely by reference to population. The great expansion of coffee drinking in the United States is not more than fifty years old, and was inaugurated by an intensive advertising campaign. Similarly, the habit of tea drinking in Canada is not something that has merely grown of itself. In 1929, the head of one of the great firms which has played a leading part in extending the sales of tea in Canada, writing with all his experience in Canada behind him, expressed himself as follows on the possibilities of extending the use of tea in the United States:—

The United
States of
America.

“ That its consumption can be extended is without question, but this cannot be effected in a day. It certainly can be done by keeping the article continually before the public; make people think your article and the demand for it will grow . . . I commenced advertising 30 years ago, and I have found that advertising pays. When we opened new branches in different

parts of the United States, where the consumption per caput is exceedingly small, it would cost us at times much more than a dollar a pound in advertising for every pound we sold, and the cost of placing tea in a new branch would be more like three or more dollars a pound. This, of course, gradually gets less as the sales increase, as they always have done."

He adds that even "in Canada the consumption of tea might be increased a hundred per cent."

Although the most intelligent advertising cannot show results "in a day," it seems justifiable, in the light of this opinion, based on experience, to regard the United States as offering a large and promising outlet for the increasing production of the present and for the still larger production of the future.

U.S.A. net
import.

111. At the moment, however, the total imports of tea into the United States show little, if any, tendency to increase. Both before the war and in recent years the total fluctuated roughly between 80 and 90 million lbs. The net import figure of 88.8 millions for 1928 was actually less than the average figure for the years 1896-1900, and the present consumption of .75 lbs. per head compares unfavourably with the figure of 1.32 lbs. which was the average 50 years ago. This paradox is perhaps partly to be explained by the fact that the increased population includes large numbers of immigrants to whom tea has been almost unknown, but the figures also suggest the possible existence of local or other boundaries to tea drinking in the community.

Progress of
Indian Tea
in U.S.A.

112. In recent years the Indian tea industry has devoted a considerable amount of money to advertising in the United States, on the Continent of Europe, and in India itself, the funds being collected by Government under the Indian Tea Cess Act, which was passed, at the instigation of the industry, in 1903. The original cess of $\frac{1}{2}$ pie per lb. on all tea exported has since been raised to $\frac{3}{4}$ pie per lb. (less than 1/10 of a penny per lb.) and in the last three years the amount collected has averaged about £98,000, of which upwards of £40,000 a year have been expended in the United States. An earlier campaign conducted by the Ceylon industry, which between 1888 and 1908 spent some £12,000 a year in the United States and Canada, was discontinued owing to disappointing results. The methods of the Indian campaign have recently been modified, more stress being laid on lecture demonstrations, and those concerned are satisfied with the change.

113. The intensive campaign in favour of Indian Tea in the United States opened in 1923 and bore immediate results. Imports of Indian tea increased from 12 million lbs. in 1923, to 15 million lbs. in 1924, and 18 million lbs. in 1925—at which figure they have remained. At first, Ceylon tea was carried along by the movement. Imports increased from 22 million lbs. in 1923 to 25 million

lbs. in 1924, about which figure they have since oscillated. It may safely be asserted that half the tea now consumed in the United States comes from India and Ceylon. As total consumption has hardly varied (see preceding paragraph) the gain has been at the expense of the teas from China and Japan, which provided in pre-war years over 70 per cent. of the requirements of the United States. It is reasonable to infer that much of this increase has been due to advertising campaigns supported by the Indian Tea Cess Committee.

114. While it may be a question whether the displacement of China and Japan tea in the U.S.A. will continue at the same rate, steadily maintained publicity is needed both to consolidate the ground gained and also to widen the market by appealing to a wider public. It is generally agreed that for this the first essential is to educate the public in the way in which tea should be made, and in the present campaign particular attention is being paid to this side of the problem. There are, of course, one or two practical difficulties in this case, which though rooted in established custom, are not insuperable. There is, for instance, the practice of infusing the tea in muslin bags, which often do not allow of a full expansion of the tea leaves. Again, those who have been used to drinking China tea—and more especially green tea—are inclined to suspect any but a very weak infusion as being too strong. This ignorance of the difference between the apparent and the real strength of India and Ceylon tea, as compared with China tea, helps to explain why tea drinkers in the United States tend to make the infusion so weak that the beverage is neither so satisfying nor so refreshing as it should be, and one result of the present demonstration campaign has been that many have been pleasantly surprised to find what a delightful drink good Indian and Ceylon tea really is.

115. In this connection it may be worth while to point out that nothing so well advertises tea as an actual tea-shop where the public can obtain the beverage itself, in pleasant surroundings, and made as it should be made. One of the best known tea-distributing firms in the United Kingdom began not many years ago with a single tea shop in the West End of London, and so well did the shop and its subsequent branches create a name for the tea that to-day the sale of tea in all the branches, numerous as they now are, is infinitesimal compared with the distributing business which has largely developed out of them. Similar enterprise in the United States might well meet with similar success. A chain of tea shops might be established in selected cities, in which Indian and Ceylon tea would be available, prepared by an experienced staff. Such shops, which at first would have the attraction of novelty, might well create a new taste, and, by disseminating a knowledge both of the fine qualities of the beverage and of the way in which it should be prepared and consumed, form the *nucleus* of an extensive distributing organisation. Moreover they might be made a means

Practical difficulties.

Value of Tea Shops for popularising Tea.

of advertising other Indian and Ceylon products side by side with tea. If the Indian and Ceylon Associations could get together and explore these possibilities, perhaps in conjunction with such catering and distributing firms as might be inclined to join in the enterprise, we believe that it should form a useful addition to the present campaign.

Importance
of joint
action by
Empire
Producers.

116. We desire to emphasise the advisability of joint work by the Indian and Ceylon interests. In some quarters there is still a tendency to prefer isolated action and in others a diffidence as to the value of spending money on advertisement, but the present is an advertising age, and particularly in the United States those who have goods to sell must be prepared to spend money and spend it freely not only in making their goods known but also in keeping them before the public. If they do not, their competitors will. There are for instance other interests which have recently been spending large sums of money in propaganda hostile to tea as such. Again, Empire-grown tea is likely in the future to feel increasing competition from foreign teas, and it is important for Ceylon to join forces with India to meet this competition. India and Ceylon produce the finest tea in the world and it is further fortunate that for blending purposes they make an excellent combination. Joint effort on the part of Indian and Ceylon interests in popularising tea drinking in the United States is therefore not only desirable, but well nigh essential. If concerted action to that end cannot at once be secured we should regret it, but none the less we hope that the Indian campaign will continue, and that before very long both Indian and Ceylon interests will realise that more is to be gained by solidarity than by dispersion of effort. It is also advisable that in any country in which advertising is undertaken, the co-operation of the distributing trade should be sought wherever possible. Such co-operation, if it can be obtained, is well worth obtaining.

Possibilities
of U.S.A.
market.

117. It must of course be recognised that the United States is and is likely to remain a coffee-drinking country. The objective of the tea trade would be not to displace coffee but to widen the market for tea as an additional drink, and present circumstances offer a favourable opportunity for advance along these lines. The possibilities of the market, even within these limits, are apparent when it is considered that if the whole of the white population of the United States drank one cup of tea a day—which would still leave them a coffee-drinking people—the total consumption would exceed 197 million lbs. a year, or more than double the present figure. Such a result is not to be achieved all at once, but may yet be the reward of those who realise the cumulative effect of united and sustained effort.

Russia still
a large
buyer.

118. Before the Revolution, Russia was the second largest importer of tea in the world. As such it was a very important

market for buyers of Indian and Ceylon tea. In the pre-war quinquennium Indian exports of tea to Russia were, on the average, two and a half times as great as those to Canada—the next largest buyer—i.e., 35 million lbs. to Russia as against 14 to Canada.

Russia has now fallen behind the United States, but still ranks third as an importer of tea. No greater mistake could be made than to imagine that Russia has ceased to count as a tea-drinking country. In 1927-28 the total imports of tea into Russia were 65 million lbs. in contrast with 172 millions in 1914—a drop to little over one-third of the old figure, though, even so, it showed an increase of 34 per cent. on the figures for 1926-27.

Over half the tea imported into Russia in 1927-28 was in brick or tablet form—probably about 35 million lbs. Of the remaining 30 million lbs., about 12 million lbs., in about equal proportions of black and green tea, came from China. This left some 18 millions to come from other sources, the great bulk being supplied from India and Ceylon.

119. Under-consumption in Russia is one of the principal factors in the present situation. Were Russia able to purchase tea on the pre-war scale there would be no surplus and no talk of "over-production." The difference between the present and pre-war import into Russia is more than 100 million lbs.—or nearly twice the amount of reduction sought under the restriction scheme. Some Empire-grown tea—as shown in paragraph 118—is already going to Russia through the ordinary channels but attempts in 1929 to relieve the market by the joint sale to Russia of large quantities broke down largely on terms of credit. The question whether business was or was not possible on the terms offered is one which the interests concerned were alone competent to decide, but influential sections among the producers believe that organised sales to Russia would be to the ultimate benefit of the industry by relieving the market of the present dead weight of accumulated stocks. The opportunity may arise again, and in that case it is not unreasonable to expect that its possible effect on the stock position will be very carefully weighed.

Importance
of restoring
Russian
market.

120. It is impossible to forecast the future developments of the Russian market. Before the war tea had become a truly national drink. The younger generation now growing up may be much less familiar with it, but it is hard to believe that the taste for it will disappear. In estimating the chances of the future it will be necessary to watch the attempts now being made to extend tea cultivation in the fertile valleys of Georgia.

Tea
Growing in
Georgia.

The Government, as well as the consumers' Co-operative Society (Centrosojus) is devoting considerable sums of money to the development of the industry, which is administered by a special organisation, the Georgian Tea Trust, established in 1925. Beside some 50,000 peasant families engaged in tea cultivation, the trust

has also established two extensive State farms, part of which is under tea. There are also three experimental stations for Research. The extension of the area under tea to an estimate of 90,840 acres at the end of 1933 is part of the general five-year plan for the development of agriculture, and includes an increase in output capacity of the present tea-factories and an increase of their number to 29 by the end of the period. The estimated development in production is as follows:—

<i>Estimated Tea Production in Russia</i>	
1929	500,000 lbs.
1930	900,000 lbs.
1940	46,000,000 lbs.

The quality is expected to be similar to that of the medium grades of Indian and Ceylon tea.

These are estimates. The future alone can show to what extent they may be realised; but even if they are accepted as they stand, they will not fill the gap of 100 million lbs. by which imports are now below the pre-war figure.

Great possibilities of local market in India.

121. As the greatest among the exporting countries, India is the most severely affected by the present necessity for an expansion of the market, and it is therefore important to realise that no market in the world offers such ultimate opportunities for an increase in tea consumption as India itself. India at present produces 400 million lbs. If the whole population drank one cup of tea a day, the home consumption alone would require a production of 580 million lbs. a year, before a pound would be available for export. This is, of course, a paper calculation, and it is unlikely that any but a moderate proportion of the 320 millions of people who inhabit this vast and varied territory can effectively be reached by the tea merchant for many years to come, but there is no reason why the home consumption of what is now a national product should not one day be nation-wide in India, as is that of China tea in China.

The work of the Indian Tea Cess Committee.

122. Excellent work has already been done to promote the sale of tea in India, under the auspices of the Indian Tea Cess Committee, and the allotment for this purpose has recently been increased from £39,000 to £50,000.

The principal avenue of approach has been the railways; and with the goodwill and co-operation of the railway officials, the Tea Cess Committee now supervise arrangements for the supply of tea to the travelling public at 606 stations, and over some 27,000 miles of railway. Careful provision is made for passengers who can obtain a 10 ounce ($\frac{1}{2}$ pint) cup of tea for one anna and a 5 ounce cup for half an anna (a little more than one penny, and one halfpenny respectively). In addition, over 90,000 practical demonstrations have been held—mostly at bazaars and large

gatherings, but also at railway stations and on the trains themselves. The next stage will be an extension of the campaign right and left of the main railway system, with the ultimate object of getting beyond the towns into the villages.

123. It is generally agreed that the work in India has been very well done, and the result is already apparent. Exact figures for tea consumption are not available, but the official estimate of the Department of Commercial Intelligence and Statistics is as follows :—

1919-20	30 million lbs.
1924-25	44 „ „
1928-29	57 „ „

Thus the total has nearly doubled in less than 10 years—a rate of advance greater than has been made in any of the principal markets in the period. At a conservative estimate, the figure might again be doubled, and perhaps more than doubled, within the next decade.

124. Whether the future rate of advance be slow or rapid, the bright side of the situation here is that, as long as the effort is sustained, there is, and will be for a long time yet, an almost unlimited market to develop, and a market which should absorb, provided they are offered at an economic price, precisely those grades of tea which tend to overweigh and depress markets elsewhere. This market at India's own door may yet prove the answer to the problems of the industry. While the slowness of the Russian recovery is one of the principal causes of the present depression, India may perhaps provide the remedy.

125. The local market in the country of production almost always repays cultivation. Even if a crop is introduced in a country primarily with a view to export, sooner or later, as in the case of India in recent years, it becomes necessary to turn attention to the home market, which, in times of severe competition in external markets, may well prove of special service to the producing interests. Tea to-day is a relatively new product in East Africa. We hope that those interested in its production will not neglect the possibilities of the market at their doors. The growth of tea drinking among the inhabitants of Africa may, and almost certainly will, be slow, but those engaged in the local cultivation of tea are best placed for encouraging local consumption. What in the long run the tea industry requires is not a still greater congestion in existing markets, but the opening of new channels of trade.

The local market in East Africa.

XIII. RESEARCH

126. In India and Ceylon the industry is now highly organised, and in both countries systematic research resulting from the initiative, and mainly financed from the resources, of the industry itself,

Present organisation in India and Ceylon.

is being actively prosecuted. This research work covers all aspects of tea production from the soil to the factory, and it is noteworthy that not only have important results been obtained but the necessity for further research work in other directions is constantly being demonstrated. Here, as in all branches of scientific investigation, advance itself reveals how narrow is the field of knowledge, and how wide the field of enquiry. In India, the research work for the tea industry has been carried out for the past 20 years by the Scientific Department of the Indian Tea Association, under the general guidance of a Sub-Committee of that Association, and a special research organisation is maintained in North East India with headquarters at Tocklai, whilst a smaller staff works in South India under the general supervision of the United Planters' Association of Southern India, which makes a contribution of about £700 to the funds of the Scientific Department. The expenditure of the Scientific Department of the Indian Tea Association in 1929 amounted to some £20,000, and included sums collected on a voluntary assessment, which amount to about 7½d. per acre, and contributions amounting to £1,050 from the Governments of Assam and Bengal. The scientific staff employed consists of eight officers, whilst an addition of another officer in 1930 is being facilitated by means of a grant from the Empire Marketing Board for five years.

In Ceylon, the research work for the industry was conducted by officers of the Government Department of Agriculture until 1925, when a separate organization, called the "Tea Research Institute of Ceylon," was constituted by legislative enactment. The Government Department of Agriculture still continues to carry on research work for the industry in regard to certain pests and diseases, and has charge of control work under the Plant Protection Ordinance, but the greater part of research for the industry is now carried on by the Institute, which is financed by a cess on all tea exports equivalent to 10 rupee cents (= 1.8d.) per 100 lbs. of made tea, equivalent to about 9d. per acre. This brings in a total revenue of about £17,000 per annum. A proposal is now awaiting the sanction of the Ceylon legislature for a temporary increase of the cess to 14 rupee cents. per 100 lbs., for three years, to meet capital expenditure on the Research Institute. The Institute in Ceylon is maintained wholly by the industry, but its initial capital for the purchase of an estate, the erection of an up-to-date factory, laboratories, etc., has been aided by means of a loan from the Ceylon Government of Rs. 1,000,000 repayable with interest by annual instalments extending over 25 years, and it has recently received assistance from the Empire Marketing Board for its experimental factory equipment. The scientific staff of the Institute consists of six officers, with the necessary field and laboratory assistants.

Research in
the Nether-
lands East
Indies.

127. We have thought it necessary to enquire into the organization of research for the tea industry of the Netherlands East Indies,

and find that an average expenditure of £17,000 is incurred by the Tea Research Institute at Buitenzorg on an assesment which has averaged, in recent years, about 1s. 8d. per acre. A staff of nine scientific officers is maintained by this Institute.

By an arrangement which has been made in recent years these workers for the tea industry in Java form one section of the larger research organization for the hill-land cultivations of Java and Sumatra. This organization is maintained by the industries concerned, independent of the Government, and the total service includes 38 scientific workers. Whilst the separate units for particular industries have a large degree of independence, co-ordination of work and finance is effected through a central authority.

128. It will be noted that the expenditure on research for the tea industry of the Netherlands East Indies is on a higher basis per acre than that which is in force in either India or Ceylon. Further, an analysis of the composition of the scientific personnel of the Research Stations in India, Ceylon, and Java reveals the fact that in Java much greater emphasis is laid on an adequate supply of agriculturists concerned with questions relating to crop production. Eleven such officers are employed in Java for hill-land cultivations, and their numbers are in excess of any other group of research workers.

Danger of too early specialisation in training of research workers.

Here, we consider, is a contrast in organization from which a lesson may be learned. The staffing of agricultural departments in many parts of the British Empire, and especially in the Colonies, leaves the impression that pathological research is more highly esteemed than physiological enquiry. Specialists have been provided for dealing with pests and diseases, whilst crop production and general husbandry have not received the attention they deserved. Fortunately, this view is now changing, and the importance of physiological work connected with crop growth is being increasingly recognised. In the agricultural training centres in the United Kingdom, however, there is still a tendency towards too early and too rigid specialization. This specialization necessitates the provision of teams of workers, and some men are often trained along such narrow lines that they find it difficult to appreciate the points of view of workers in other fields of agricultural research. Crop husbandry, in its broadest sense, should form the basis for the training of all agriculturalists.

There are a considerable number of problems connected with crop husbandry awaiting attention from workers in the Colonial Empire, and in the special crop research stations which are now being organized, and a corresponding need of men of wide general knowledge of tropical agriculture to deal with them. If there is one lesson which the tropical parts of the Empire may learn from the organization of the Java crop research stations, it is the emphasis which is there given to the work of agricultural officers directly charged with investigations of crop production.

Co-
operation
between
planters
and
research
workers.

129. Another lesson from the Netherlands East Indies to which Empire workers might give attention is to be found in the organization which provides for co-ordinating research and for bringing the results of the Research Stations to the practical man in the field. In the Netherlands East Indies, the scientific workers not only visit estates at frequent intervals and make suggestions in regard to particular investigations which are required to solve particular problems on those estates but they also arrange for special research work on, and in co-operation with, the estates themselves. A much closer contact has been effected between the research stations and the managements of estates, and the result has been not only a wider dissemination of knowledge but a more generous attitude on the part of the planters themselves towards research. The planters are further encouraged to attend meetings at the Research Institute and to express their views freely, and it is asserted that many of the best suggestions for advancing the industry as a whole have come from the planters themselves. They have shown the most active co-operation in the experiments on estates, now numbering over 200, which are under the control of the Institute, but are worked in collaboration with the estate managements. We recognise to the full the value which has resulted from the regular visits to estates paid by officers of the Tocklai Research Station in India, and from the conferences and meetings between scientific workers and estate superintendents which have been organized both in India and in Ceylon, but we wish to urge the importance of adequate organization for bringing scientific and practical workers together, and to state our conviction that the best results can only be secured when each branch of the industry—research on the one hand and practical management on the other—realizes that the best way to secure them is by working together in the closest possible co-operation. It is the actual application of research to industry which presents the greatest difficulties, but these can be overcome by co-operation and organization. To this aspect of the question we direct special attention, in the hope that it will receive the fullest possible consideration by all concerned, and in our recommendations for further research required by the tea industries of India and Ceylon we give further emphasis to our view.

Need of
closer
contact
between
research in
India and
Ceylon.

130. We have examined with interest the programmes of work now being conducted by the Indian and Ceylon organizations, and before making any suggestions for further lines of investigation, we desire first to place on record our considered opinion that there is a real need for a regular exchange of views and co-ordination of work between these organizations. Between North and South India contact is to some extent already made, and we should like to see this strengthened and moreover the staff of the South India Station increased, but between South India and Ceylon, and Ceylon and North India there is no adequate co-operation. If the research work required for the Empire's tea industry as a whole

is to be properly organized, not only is a free exchange of views necessary, but the representatives of the several units need to be brought into close touch with one another. At present workers in India and Ceylon exchange views by correspondence, but we would welcome an organized exchange of visits and joint consideration of programmes of work, while it would be an advantage for the isolated worker in South India—where conditions are not dissimilar to certain conditions in Ceylon—to be linked up with the Ceylon Research Institute. We therefore recommend that arrangements should be made (1) for the exchange of visits between workers in India and Ceylon, (2) for an exchange of programmes of work between India and Ceylon, (3) for an exchange, if possible, between the workers themselves for tours of duty, and (4) for periodic conferences between the workers in each country, and for these conferences to be attended by delegations from each of the planting interests concerned.

While we feel that steps should be taken especially to link up more closely the work in Ceylon with that in South India by means of regular visits from the Ceylon research staff, these visits should in no wise preclude visits to South India from workers in North East India, the value of which is already appreciated by all parties. Rather, we visualize the considerable advantages that would accrue from the formation of the present research institutes in India and Ceylon into as close an approximation to a single service for the tea industry as geographical and administrative boundaries permit. Such a step towards organised co-operation is certain to result in progress and development. We understand that the Rubber Industry is hopeful of an advance along similar lines, and we feel that we can also instance the work which has been done for the cotton industry of the Empire by the Empire Cotton Growing Corporation.

131. Not only is it desirable that the research work in India and Ceylon should be co-ordinated, but we would go further and suggest that it is important to establish a much more intimate contact than at present exists between the marketing and financial interests in London, and this most vital work of research upon which so much may depend. Closer acquaintance with the difficulties and the possibilities of research would, we believe, stimulate the sympathy of London interests for the claims of research as the most valuable of all forms of re-insurance, and closer acquaintance with the requirements of the market would very materially assist the actual workers in the research itself. We may illustrate this point from one or two examples which have been brought to light in the course of our enquiry.

Need for
closer
contact
between
research
workers
and the
London
market.

132. An urgent practical need in India is improvement in manufacture. Although many estates are introducing improvements in their factories or rebuilding, the policy would possibly be accelerated

if there were a clearer appreciation by the financial interests of the extent to which improvement is both necessary and profitable. We were told, for instance, of two neighbouring gardens with an identical soil and similar methods of cultivation, and only a 12-foot road dividing them. The tea on one side is made in one factory, and the tea on the other side in another factory, and the difference of the price obtained in the market is sometimes as much as 6d. a pound.

In particular, the importance of the withering process is now more appreciated, and research has already revealed the considerable variations which are possible and under control. We were told on high authority that from a given leaf a "made" tea can be produced which has a strong tannin content, a very light colour, a thin liquor and a very pungent taste. From the same leaf a "made" tea can be produced which has very much less pungency, a very deep colour and a very thick liquor. One kind will at the moment fetch 4d. a pound more than the other, and the difference will be due mainly to variation in the withering process.

Another process in which it is felt that systematic investigation is needed is that of rolling. At present the degree of hardness employed in rolling and the extent to which the process is carried are determined by the results of experience and the dexterity of the operator. Organized research into the changes that occur in the leaf—of which there is at present no exact knowledge—might materially assist the control of these changes by giving it a scientific instead of a purely empirical basis.

133. The use and choice of manure is also important. There is a tendency in the market to attribute a deterioration in the teas from certain gardens to an excess of manuring. In so far as such variations may be attributable to manuring policy, they would, according to the expert evidence presented to us, be due to the application of ill-balanced manures rather than to general excess. It was pointed out to us that in the past, and particularly between 1909 and 1920, the cry was for more and more tea, with the result that both manuring and pruning policies were directed mainly towards increasing the quantity of leaf. As slow growth is an important factor in producing high quality leaf, these policies may have adversely affected quality. Research in crops other than tea has shown that the application of ill-balanced manures or of manures unsuited to the local conditions adversely affects the quality of the produce. If, as is probably the case, this also applies to tea, the tea research departments should prove of great assistance in determining questions of manuring policy.

134. From these considerations two conclusions may be drawn. In the first place those controlling the industry may realize that the results of research will ultimately repay many times the money and time expended upon it, and in the second place, as the common

aim is to satisfy the public taste, it is important that the research worker himself should be well informed of the trend of public taste if he is to assist the grower to satisfy it. In order, therefore, to co-ordinate the research work with the demands—and they may be the varying demands—of the market, we recommend that responsible officers of the Research Departments should spend part of their time in London in order to keep in touch with the market, and carry out a scientific investigation of the type of tea which is most in demand.

135. In order to effect the triple co-ordination which we envisage, we therefore recommend the establishment in London of a Joint Advisory Committee, representative of the financial tea interests in the United Kingdom, the Indian tea-growing interests and the Ceylon tea-growing interests, to act as an advisory committee to the tea research stations in India and Ceylon as well as a clearing house of information in regard to all scientific matters concerning the growth, production and manufacture of tea, especially with a view to directing attention to the trend of taste as evidenced by the market, and bringing research workers into close touch with those interested in the financial side of the industry. While we have, in the preceding paragraphs, discussed the problem in terms of India and Ceylon, we include within our conception all the tea-growing areas of the Empire, and it is clearly desirable that areas such as Kenya, Nyasaland, and, it may be in the near future, Malaya, should be kept in touch with the work in India and Ceylon, by means of exchange of views and information and by any other means which may be found practicable.

Joint
Advisory
Committee
recom-
mended.

136. The tea plant, as now commercially grown, is indigenous to North India, and it is at the Tocklai station that improvement of plant material can most readily be effected. A certain amount of attention has been given to this question in Java, but, so far, it has not received consideration within the Empire. It is conceivable that considerable improvements in plant material might result from the labours of the plant breeder or geneticist. We therefore desire to direct attention to this aspect of the basic material of the industry's prosperity. It is also probable that some of the work done in the United Kingdom on root stocks of fruit trees may afford suggestions for profitable lines of enquiry in regard to tea. It is with satisfaction that we learn that, by means of assistance from the Empire Marketing Board, provision is now being made for physiological investigations to be carried out at Tocklai. These investigations will, we understand, be directed in the first instance towards a study of the relative rate of growth of bud and leaf, with a view to securing data which are required in relation to the routine of plucking. We note that this work will not overlap with the work which has been laid down for the plant physiologist in Ceylon, and we would here again emphasize the need for the prevention of overlapping of work at the Indian and Ceylon stations, except in cases where climatic conditions

Research
on Plant
Material.

necessitate similar investigations being carried out at both stations or where it may be considered advisable to make a double attack on a given problem, in accordance with a pre-arranged plan.

Engineering
Research.

137. Tea interests in Ceylon have, in recent years, paid much attention to the question of withering, and have evolved improvements which have been studied by representatives from both India and the Netherlands East Indies. These improvements have hitherto been effected by engineering firms and the estate managements, merely by the method of trial and error. No organised research work has been conducted and no provision is made for a close study of the data which are available. We consider that the tea industry would profit materially from a systematic investigation of tea manufacture from the engineering point of view, and we recommend that provision be made for such industrial research to be carried out by a technical officer trained in chemical engineering, to be attached to the Tea Research Institute of Ceylon. The new model factory, which has been erected by that Institute, would be able to provide the data for the preliminary investigations, and we were informed that estate factories in Ceylon would willingly co-operate in any scheme designed further to promote factory improvement and efficiency. The service of such an officer would be of value not only in advising estates in the installing of machinery, but also in advising commercial engineering firms as to the industry's requirements in machinery design. Realizing, as we do, the improvement of efficiency which has been effected in sugar factories by combined chemical and engineering research, we therefore have no hesitation in recommending our proposal to the consideration of the Empire's tea industry.

Co-
operation
for small
holders.

138. We were also informed that small co-operative factories have been established in Ceylon in recent years by co-operative effort between small owners themselves and by small owners combining with large producers. The engineer attached to the Tea Research Institute of Ceylon could be of material assistance in the development of such co-operative factories and would enable the Institute to provide a definite service of assistance to the small holders, from whom they secure a portion of their funds. Any improvement which can be effected in the methods of manufacture of tea in such co-operative factories should tend towards the improvement of the quality of the produce and thereby enable small producers the better to compete in times of severe competition. We believe that considerable improvement of the quality of tea produced by small holders in Ceylon is possible and that the establishment of factories, on co-operative lines, might be encouraged by those responsible for the furtherance of the co-operative movement in Ceylon. Assistance by the provision of expert advice from the Tea Research Institute should be particularly helpful.

139. The selection and supply of a pure strain is as important for agriculture as for stock farming, and we have already recommended fundamental research on plant material as a suitable task for North India. In Ceylon the problem of seed supply is of a more practical nature. While it is now becoming difficult for planters to obtain land for the purpose at elevations above 5,000 feet, the areas already established show, through age, pests, diseases, and other causes, considerable vacancies. These losses, we understand, are progressive. Attempts are being made to supply the want, but not without difficulty, whilst planting material from first class seed is not abundantly available at reasonable rates. Further, the paramount interest of protecting the plantations from disease has made it necessary for Ceylon to prohibit imports of tea seed. In consequence, the price of locally raised seed has increased in recent years. There can be no doubt that an adequate supply of tea seed for new plantings and renewals is an urgent need of the industry, and we consider that immediate steps should be taken to establish, at high elevations, and isolated from the general areas of cultivation, adequate seed-garden areas for the supply of tea seed of the highest proved quality.

Seed
Gardens.

140. The establishment of such seed gardens is, we feel, the means whereby the Government of Ceylon could best assist, at this stage, in providing for the security of an industry upon which the prosperity of the Island in no small measure depends and from which the Government derives considerable revenue. We therefore recommend that the Ceylon Government should favourably consider taking up the question, in consultation with the industry, at the earliest opportunity. It may be urged that the task should be left to the industry and its research organisation, but we feel it would be unwise to accept this view, not only on the economic ground already mentioned, but because the Government is in this case in a better position to obtain the suitable land, and because the provision we recommend may be regarded as one which, in countries like Ceylon, comes within the legitimate field of Government activity.

141. We have been informed that the Ceylon Government has already made provision for a special inspection and advisory service in connection with the control of pests and diseases. We feel that the industry should render every assistance to ensure that the service is adequately maintained in the tea growing districts, and that the organisation of a similar system in other tea producing districts in the Empire is worth serious consideration.

Control of
pests and
plant
diseases.

142. The possibility of the biological control of the Tea Tortrix pest in Ceylon was raised in evidence presented to us, and we understand that this matter is now under consideration by the Empire Marketing Board. We trust that the possibility and practicability of controlling this pest by biological means will be carefully examined, and that if the expenditure for large scale attack seems warranted, financial assistance may be forthcoming.

XIV. CONCLUSION

143. The tea trade to-day is essentially the result of Empire enterprise and energy. For the moment, the potential capacity for production has outstripped the immediate market demand. Similar situations have arisen in the past, and invariably, in a short space of time, consumption has expanded so as to justify the planting of new tea gardens. That expansion, however, has been most frequently stimulated by the ever increasing devotion of the people of the United Kingdom to tea as a beverage. While we do not believe that the limits of consumption in the United Kingdom have yet been reached, it appears unlikely that the rate of expansion in the next 30 years will equal that of the past 30 years. If the gardens are to be fully worked once more, and the developments now foreshadowed are realised, the need for wider markets will be greater. Such markets can only be won by continued efforts in which there should be no room for sectional jealousies. The object is the wider consumption of tea in the world. In this object Empire producers are primarily interested. Competition from foreign sources will grow, but Empire producers have such a start in the trade that they have most to gain from a vigorous effort to extend markets.

144. At present the chief foreign competition comes from Java and Sumatra, where considerable improvements have recently been effected in factory practice and where increasing attention is being paid to better plucking and better cultivation. In order, therefore, that they may hold their own in competition, the maintenance and improvement of the quality of Empire grown teas will be of ever increasing importance. For this reason we have specially emphasised in our report the necessity for close attention to methods of manufacture. We have also stressed the need for close collaboration between Empire producers—especially those in India and Ceylon—in the vital work of research, and also the need for keeping those responsible for the direction of research aware of the changing trends of public taste as evidenced in the London tea market.

145. In the United Kingdom, tea producers of all countries now enjoy a free market. There is now neither a preferential duty, nor even, as in Holland, a revenue duty on tea. In Mincing Lane teas grown within the Empire and in foreign countries compete on quality. There the wholesaler gets what he wants and knows what he gets. When, however, the tea comes to be retailed, it is almost invariably blended, and the consumer cannot know what admixture of foreign teas has entered into the blend unless he is told by label. Even when full allowance has been made for the difficulties of the large scale blender, we are of opinion, from all the information before us, that the quantities, varieties, and qualities of tea now produced within the Empire are such that blends to suit almost any taste and almost any purse can be maintained from Empire grown teas alone. Particularly is this true of

the medium priced blends which constitute the great bulk of the retail trade.

146. To this end, we believe that it should be possible, on a voluntary basis, to enable the consumer to exercise a voluntary preference. The large distributors are few. Some already sell blends composed entirely of Empire grown teas, but they make little or no attempt, by appropriate label, to bring that fact home to the public, thereby failing to take advantage of the increasing good will in the United Kingdom for Empire grown produce. There is now a favourable opportunity for increasing the number of such blends, for labelling them in an unmistakable manner, and for bringing them prominently to the notice of the consumer as blends maintained exclusively from teas grown within the Empire.

147. The prime fact, however, is that tea drinkers are on the whole critical of quality and buy the best that their purses can afford. It is by high quality on the average that tea producers in the Empire have secured their present position in the world market. It is by quality that they must defend their market in the United Kingdom against the invasion of competitors who are becoming more efficient in production. It is by quality that they should take and retain the lead in the new markets in which there is the greatest scope for stimulating demand. It is therefore essential to maintain and improve quality by continued research and incessant care, both in cultivation and manufacture.

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G. GRINDLE	}	Colonies and Protectorates
J. H. BATTY		
		D. T. CHADWICK (Secretary)
		LIONEL BRADGATE (Assistant)

6 January, 1931

Sir Thomas Allen saw and approved the first draft before his departure to the Far East as a member of the British Trade Mission. He authorized his signature to be attached to the final report, provided that no changes of substance were made. His signature has been attached. Mr. F. N. Blundell has not signed as he was unable to be present during the discussions in Committee, but he does not dissent in any way from the report or its presentation.

APPENDIX A

Production of Tea (in pounds) in India by Provinces and States, in 1924, 1927 and 1928—Figures of the Indian Department of Commercial Intelligence and Statistics.

—	1924	1927	1928
Assam			
Bramaputra Valley	165,781,842	163,350,276	173,785,864
Cachar and Sylhet	71,371,268	72,537,555	72,231,814
Total: Assam	237,153,110	235,887,831	246,017,678
Bengal	87,121,205	97,001,992	95,010,006
Bihar and Orissa	213,513	306,651	331,073
United Provinces	1,741,316	1,597,625	2,133,764
Punjab	1,936,762	2,076,400	1,904,866
Madras	19,696,357	24,132,189	26,785,363
Coorg	(a)	151,819	216,265
Tripura (Bengal)	338,272	940,062	1,095,648
Travancore	27,055,339	28,825,276	30,188,320
Mysore	(a)	(a)	81,763
Total: India	375,255,874	390,919,845	403,764,746

(a) Figures not available.

APPENDIX B

Stocks of Tea in London Warehouses at 31st December, in thousand lbs.

The figures are those compiled by the Tea Brokers' Association of London, from returns supplied by the London Tea Warehouses, which are estimated to handle 90 per cent. of the United Kingdom import.

—	1927	1928	1929	1930
India	149,090	158,056	180,131	175,479
Ceylon	33,778	28,479	37,509	35,063
Java and Sumatra	16,154	23,759	31,838	39,107
China	13,739	9,916	10,306	10,983
African and Sundry	263	312	642	968
Total	213,024	220,522	260,426	261,600

APPENDIX C

TABLE I

*Average Wholesale Prices of Tea, in Mincing Lane, 1922-1930
in Pence per Pound*

	North India	South India	Ceylon	Nyasa- land	Java	Sumatra	Indian B.P.S.	All Tea
1922	15.46	14.00	15.84	10.77	10.13	11.24	13.13	15.10
1923	18.76	18.14	19.38	16.34	14.94	16.45	16.86	18.68
1924	19.92	19.02	20.77	16.57	15.46	17.90	17.31	19.78
1925	17.68	17.62	20.09	13.24	12.83	16.56	14.24	18.08
1926	19.36	19.00	20.32	17.41	15.86	16.28	17.00	19.34
1927	19.01	18.88	20.82	15.25	13.73	16.02	15.11	19.01
1928	16.49	15.40	18.97	13.18	12.58	13.92	14.29	16.73
1929	15.72	15.35	19.02	12.29	12.05	13.88	10.48	16.27
1930	14.69	14.52	18.61	9.40	10.22	11.22	9.00	15.24

TABLE II*

*Average Annual Rates of United Kingdom Duty in
Pence per Pound*

	1922	1923	1924	1925-28	1929	1930
India	7.83	6.66	4.50	3.33	1.17	} Free
Ceylon and Nyasaland	7.66	6.66	4.33	3.33	1.00	
Java	9.48	8.00	5.48	4.00	1.48	
Sumatra	9.60	8.00	5.60	4.00	1.00	
All Tea	8.15	6.93	4.68	3.47	1.21	

* For years in which a change in the rate of duty occurred, allowance has been made for the proportions of the crops of different origin sold before and after the change.

APPENDIX C

TABLE III

Average Annual Wholesale Prices, plus Duty, and Average Retail Prices, with Differences between Retail Prices and Cost of "All Tea," 1922 to 1930. Prices in pence per pound.

	North India	South India	Ceylon	Nyasaland	Java	Sumatra	Indian B.P.S.	All Tea	Retail Prices (Ministry of Labour)	Difference in pence per pound between Retail Price and "All Tea"
1922	23·29	21·83	23·50	18·43	19·61	20·84	20·06	23·26	28·50	5·24
1923	25·42	24·80	26·04	23·00	22·94	24·45	23·52	25·62	30·50	4·88
1924	24·42	23·52	25·10	20·90	21·04	23·50	21·81	24·47	28·75	4·28
1925	21·01	20·95	23·42	16·57	16·83	20·56	17·57	21·52	29·25	7·73
1926	22·69	22·33	23·65	20·74	19·86	20·28	20·33	22·81	29·35	6·54
1927	22·84	22·21	24·15	18·58	17·73	20·02	18·44	22·48	28·60	6·12
1928	19·82	18·73	22·30	16·49	16·58	17·92	17·62	20·20	28·70	8·50
1929	16·89	16·52	20·02	13·29	13·53	14·88	11·65	17·48	25·40	7·92
1930	14·69	14·52	18·61	9·40	10·22	11·22	9·00	15·24	23·75	8·51

APPENDIX D

A list of 36 countries showing total annual consumption (in million lbs.) and consumption in pounds per head.

	Total Consumption	Consumption per head
United Kingdom	421.3	9.20
United States of America	88.8	.75
Russia (including brick tea)	64.7	.60
India	57.0	.18
Australia	49.0	8.15
Canada	39.0	4.10
Irish Free State	23.6	7.90
Holland	23.4	3.10
Egypt	14.3	1.02
Persia	13.0	1.30
New Zealand	11.9	7.90
Germany	11.7	.18
Morocco	11.6	2.31
South Africa	11.5	1.43
Chili	7.0	1.75
Poland	6.0	.22
Argentina	3.8	.37
France	3.3	.08
Tunis	3.0	1.50
Czechoslovakia	1.6	.11
Turkey	1.6	.13
Austria	1.5	.22
Switzerland*	1.5	.37
Denmark	1.4	.41
Newfoundland	1.4	5.46
Kenya Colony	.9	.36
Sweden	.8	.13
Greece	.6	.09
Belgium	.5	.37
Brazil	.5	.01
Italy	.4	.01
Norway	.4	.14
Spain	.4	.01
Mexico	.2	.13
Bulgaria	.1	.37
Hungary	.1	.12

The figures for foreign countries, other than Russia and the United States of America, are taken, by permission, from the tables issued by Messrs. Lloyd, Matheson and Carritt.

APPENDIX E

Retained Imports of Tea in the United Kingdom, 1919 to 1930, in million lbs.

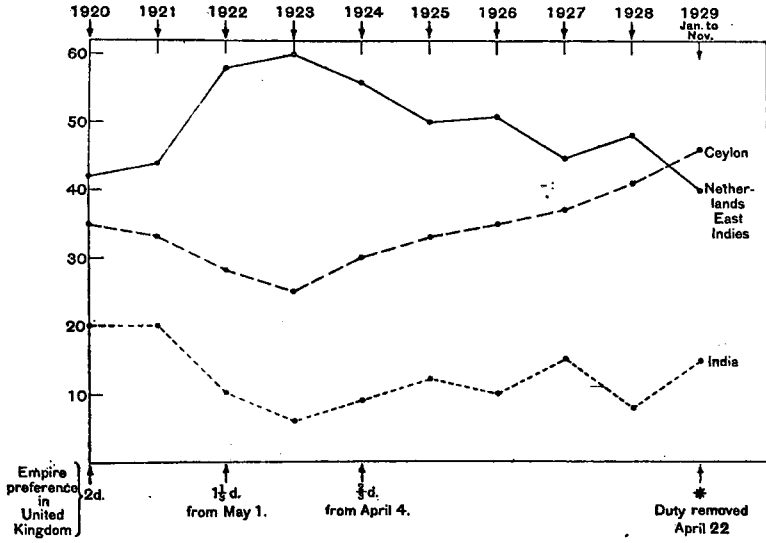
—	India	Ceylon	Other Empire Countries	Netherlands East Indies	Other Foreign Countries	Empire Total	Foreign Total	Total	Empire Percentage
1919	274.1	131.0	2.0	34.6	23.1	407.1	57.7	464.8	87.6
1920	234.2	107.5	.8	36.6	10.8	342.5	47.4	389.9	87.8
1921	274.2	105.9	.1	33.2	.6*	380.2	32.6	412.8	92.1
1922	241.2	97.2	.9	34.1	3.6	339.8	37.7	377.0	90.0
1923	236.7	105.8	1.1	29.6	19.3	343.6	48.9	392.5	87.5
1924	253.5	111.3	1.2	49.6	19.0	366.0	68.6	434.6	84.2
1925	241.8	109.8	1.4	42.4	6.7	353.0	49.1	402.1	87.8
1926	227.3	117.2	1.6	54.6	10.2	346.1	64.8	410.9	84.2
1927	255.9	118.2	1.5	64.8	11.0	375.6	75.8	451.4	83.2
1928	239.4	112.5	1.3	60.6	5.0	353.2	65.6	418.8	84.3
1929	251.9	126.2	2.8	75.0	8.2	380.9	83.2	464.1	82.1
1930†	238.3	126.2	2.8	76.7	.9.0	367.3	85.7	453.0	81.0

* Exports in excess of Imports.

† Preliminary figures.

APPENDIX F

Percentage share in Australian Tea Import, 1920—1929 (calendar years), of Ceylon, India and Netherlands East Indies.



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Reports of the
Imperial Economic Committee

Nineteenth Report

COFFEE

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Nineteenth Report : Coffee

To the Right Honourable J. RAMSAY MACDONALD,
Prime Minister of the United Kingdom.

To the Right Honourable R. B. BENNETT,
Prime Minister of the Dominion of Canada.

To the Right Honourable J. H. SCULLIN,
Prime Minister of the Commonwealth of Australia.

To the Right Honourable G. W. FORBES,
Prime Minister of the Dominion of New Zealand.

To General the Honourable J. B. M. HERTZOG,
Prime Minister of the Union of South Africa.

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To the Honourable H. U. MOFFATT, C.M.G.,
Premier of Southern Rhodesia.

To the Right Honourable W. WEDGWOOD BENN, D.S.O., D.F.C.,
Secretary of State for India.

To the Right Honourable Lord PASSFIELD,
Secretary of State for the Colonies.

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REPORT

I. INTRODUCTION

We, the Imperial Economic Committee, appointed by the Governments of the United Kingdom, the Dominions, India, and the Colonies and Protectorates, acting under our terms of reference published on the 6th March, 1925, beg leave to present to the Governments of the Empire this our nineteenth report—*The Preparing for Market and Marketing of Coffee*.

2. We have examined a number of witnesses representing producing and marketing interests, and we have further had the advantage of consultation with experienced officials both of the United Kingdom and oversea Governments, and with men of scientific eminence. We thank them and all those who have appeared before us, or otherwise aided us in our enquiry, for their skilled assistance.

3. During our enquiry, the general depression in world trade, which has been marked by very heavy falls in the wholesale prices of primary products, has increased. Coffee producers have not escaped. In our report we necessarily concentrate attention on the problems at present confronting coffee producers and the coffee trade, but it is a matter of common knowledge that similar difficulties are being experienced in other trades. We draw attention in our report to the heavy fall in wholesale prices for coffee between 1925 and 1930, amounting in the case of Brazilian coffee (Santos superior) to 48 per cent. Sensational declines in price have not, however, been confined to tropical products. Had we been dealing with wheat, for instance, we should have had to record that the wholesale price in Winnipeg for Manitoba No. 1 at the end of 1930 showed a drop of 67 per cent. compared with the price at the end of 1925. In both cases, prices have fallen still further in 1931. The fall in coffee prices is not an isolated phenomenon, but is, to some extent, one phase of a world-wide movement.

4. None the less, the course of coffee prices in recent years does present two features of particular interest, with which we deal more fully later on. Exceptionally heavy crops of Brazilian coffee, and perhaps still more the prospect of yet heavier crops to come, had forced down the price of ordinary grades well before the general world depression had set in. The present difficulties in the coffee trade cannot, therefore, be ascribed solely to the general world slump. In spite of this early worsening of the Brazilian coffee position, the fall in prices of the best grades of coffee, such as Costa

Rica and Empire-grown coffees, have been relatively less severe—thereby affording a clear illustration of the well-known trade experience that, where there exists a marked difference of quality in the grades of a primary product, the higher grades suffer less in times of trade depression than do the lower grades. The fall in the prices of Costa Rica, Indian and East African coffees, serious though it has been, has been proportionately less severe than the fall in the prices for Brazilian coffees (see paragraph 22 below).

We laid stress on a similar fact in our recently published report on Tea, where it was noticeable that in the period then under review, the fall in prices for Ceylon and the better Indian teas had been less severe than was the case with the Javan and lower grade Indian teas. In short, quality pays, and never more so than in hard times.

II. POSITION OF THE EMPIRE IN WORLD TRADE IN COFFEE

5. The coffee produced in the British Empire is among the finest in the world, but while in respect of quality it ranks very high, in quantity it amounts to only 3 per cent. of all coffee entering world trade. In the United Kingdom the consumption of coffee per caput is very small compared with that of tea (an annual average of $\frac{3}{4}$ lb. as against $9\frac{1}{2}$ lbs.), but the consumers are mostly those who purchase fine quality coffee. London has in consequence come to be recognized as the principal market in Europe for coffee of high quality, and on an average 46 per cent. of the gross imports are now re-exported. In this discriminating market, Empire-grown coffee now holds a strong position, both in the home and in the re-export trade. In 1930, about one half of the coffee consumed in the United Kingdom, and about one half of the total imports and re-exports, came from Empire countries. These countries, however, exported in that year a total of 971,000 cwts., which was greater than the total coffee import of the United Kingdom (815,000 cwts.) and more than three times greater than the average United Kingdom consumption (315,000 cwts.).

This is largely due to the development of a new source of supply. In addition to the old favourites from India and the West Indies, increasing quantities of fine coffee are now coming from the new areas in East Africa, where production has developed rapidly since the war, the total exported in 1930 (591,000 cwts.) being nearly 15 times greater than it was in 1913.

6. The world supply is divided by the trade into two sharply-defined classes, Brazilian coffees and "mild" coffees, corresponding to a very marked difference in quality and flavour. The difference between the two types, which is unmistakable when they

Trade distinction between Brazilian and 'Mild' Coffees

are tasted one against the other, may perhaps best be expressed in words by saying that typical Brazilian coffees tend to be strong and coarse rather than sharp, while typical "mild" coffees are sharp rather than strong in flavour. The following tables show the proportions of each entering world trade.

(A) *Exports of Coffee in thousand bags of 132 lbs.*

	1924	1928	1929
Brazilian Coffees	14,268	13,881	14,281
Mild Coffees :			
British Empire	488	683	450
Costa Rica	304	315	355
Colombia	2,220	2,665	2,836
Netherlands East Indies	1,219	1,938	1,856
Other Countries	4,542	4,532	4,635
Total, Mild Coffees	8,773	10,133	10,132
Total, ' Brazilians ' and ' Milds '	23,041	24,014	24,413

(B) *Percentage of Totals*

	Percentage of combined total			Percentage of ' Milds ' total		
	1924	1928	1929	1924	1928	1929
Brazil	61.9	57.8	58.5	—	—	—
British Empire	2.1	2.8	1.8	5.6	6.7	4.4
Costa Rica	1.3	1.3	1.5	3.4	3.1	3.5
Colombia	9.6	11.1	11.6	25.3	26.3	28.0
Netherlands East Indies	5.3	8.0	7.6	13.9	19.1	18.3
Other Countries	19.8	19.0	19.0	51.8	44.8	45.8

Empire
Coffee
Exports
in recent
years.

7. It should be added that the 1929 coffee season was a poor one in all Empire countries. In 1930, the season was normal, and the Empire export was 824,000 bags. On this basis, the proportion of Empire grown coffee exports in the total for "mild" coffees—their proper category—should be in the neighbourhood of 7 per cent., as in 1928.

Detailed figures for the exports of coffee from Empire Countries for the years 1924 to 1930 are given in Table 2 of the Appendix. These are here summarized for the last 5 years.

Empire Coffee Exports, 1926-1930
(calendar years)

	In thousand cwts.			Total in cwts. (000)	Total in bags (000)
	East Africa	India	West Indies and Brit. Guiana		
1926	305.4	109.3	77.7	492.4	417.8
1927	385.5	279.7	87.0	752.2	638.2
1928	460.9	255.0	89.5	805.4	683.3
1929	352.3	103.3	74.4	530.0	450.0
1930	590.9	311.5	69.3	971.7	824.5

8. In the supply of bulk coffee, Brazil has gained a predominance which may be compared with that won in recent years by British West Africa in the supply of bulk cocoa. Brazil now produces between 60 and 70 per cent. of the world's coffee, and the United States, in their turn, consume over one half of the Brazilian and nearly one half of the world supply—a position analogous to the production and consumption of tea in the British Empire. Brazilian coffees are employed as the basis of blends in countries where coffee is consumed by the great mass of the population. For example, it is said that in the United States the typical standard blends having a wide sale contain from 60 to 80 per cent. Santos coffee, blended with mild coffees, chiefly from Central America. Among the countries exporting mild coffees, the principal, as is shown in the tables in the preceding paragraph, are Colombia and the Netherlands East Indies. Between 80 and 90 per cent. of the Colombian coffee goes to the United States, where it constitutes about 18 per cent. of the total import, being one of the favourite fine coffees there used for giving flavour to a blend. The coffee from the Netherlands East Indies, the bulk of which goes to France and the United States, is now mostly of the variety known as Robusta, which is a much coarser type than the more delicate Arabica. The Robusta coffee produced in the Netherlands East Indies, where considerable care is taken both in the cultivation and preparation of the crop, is said to have a neutral flavour which makes it acceptable for blending purposes.

Pre-
dominance
of Brazil in
supply of
bulk coffees.

9. Empire coffees are all in the mild category, and compete with the finer mild coffees of Central America, such as Costa Rica, rather than with Brazilian coffee. They are affected by Brazilian coffee prices in so far as the price of so large a proportion of the world supply necessarily affects the general price level, but not so seriously as would be the case were they not in a different category of type and quality. The Brazilian coffees hold their market in

Empire
Coffees all in
the 'mild'
category.

the larger coffee consuming countries on price and because these markets require large and regular supplies of cheap coffee of a standard grade. When, however, the prices of Brazilian coffees are maintained at artificial levels, as by the "valorization" schemes of recent years, the lower grades of "mild" coffees, including some grown in the Empire, have an opportunity to compete. The converse also holds, that in proportion as the production of such grades within the Empire, e.g., of Robusta coffees, increases, they will have to compete in price with the bulk coffees of Brazil.

III. THE BRAZILIAN COFFEE SITUATION

Previous crises in the Brazilian coffee industry.

10. Financial crises in the coffee industry of Brazil, due to over-rapid extension of coffee planting and to bumper harvests, have been recurrent in the present century. A fall in prices in 1902, following a bumper harvest in the season of 1901-1902, led to prohibition of new coffee planting, which was maintained for ten years. Since 1912, however, similar situations have been met not by an endeavour to restrict planting, but through the raising of large loans used to maintain the price level by withholding surplus stocks from the market and regulating the flow of coffee to the ports. Such loans were floated in 1906, 1917, 1921 and 1927. In each case the immediate object was attained, but these repeated interventions to maintain prices, unaccompanied by adequate control of planting, have meant that the artificial level so maintained has acted not only as a protection for old (and possibly uneconomic) plantations, but also as a stimulus to fresh planting, and with the coming into being of larger and larger coffee areas in the country, the surplus, in years of heavy crops, has been correspondingly larger, and the disposal of it more difficult to finance.

Heavy crops in recent years.

11. In 1927-28 the Brazilian crop reached the record figure of 26 million bags, which was not only nearly double that of the previous season (15 million bags) but nearly double the average for the previous five seasons, and may be taken to indicate the coming into bearing of considerable areas of new plantations as well as exceptionally favourable weather conditions.

Effect of 'valorization' schemes on production in other countries.

12. While the maintenance of an artificial price level by means of successive "valorization" schemes thus appears to have stimulated production in Brazil and prepared the ground for a fresh crisis following each crisis surmounted, the same policy gave an opportunity for increased production in other countries. The effect of this, in a general increase of coffee exports from the producing countries may be seen in the following table, which is based on figures published by the United States Department of

Commerce in a review of world exports of coffee (*Trade Promotion Series*, No. 110, Washington, 1930). It will be observed that the principal advance has been made by Colombia and the Netherlands East Indies.

*Exports of Coffee in thousand bags
(calendar years)*

	1913	1924	1928	Plus or minus, 1928 on 1913
Brazil	13,268	14,268	13,881	+ 513
Colombia	1,023	2,220	2,655	+ 1,632
Rest of South America	1,149	1,053	884	- 265
El Salvador	481	815	887	+ 406
Costa Rica*	217	304	315	+ 98
Rest of Central America	1,009	949	1,079	+ 70
Netherlands East Indies	435	1,219	1,938	+ 1,503
India	167	177	216	+ 49
British East Africa	34	259	391	+ 357
Total, including other countries	19,333	23,041	24,014	+ 4,681
Brazilian share per cent.	68.6	61.7	57.8	—

(* to Sept. 30)

13. Taken over a long series of years, a fair balance between production and export of Brazilian coffee appears to have been maintained till 1928. From time to time favourable seasons left Brazil with a surplus which was disposed of by successive valorization schemes—aided perhaps by short crops. When, however, the exceptionally heavy crop of 1927-28 was followed by a further heavy crop in 1929-30, the scheme then in operation was thrown out of gear. Owing to the accumulation of up-country stocks the published statistics have been criticized as estimates which fell short of the real total. While recent figures for Brazilian production and stocks may be liable to correction, the table following may be taken as giving a general review of the present situation.

Crop year	Brazil crop	World Consumption	Calendar Year	Brazil Export	'Mild' Coffee Export
	Million Bags			Million Bags	
1925-26	14.0	21.7	1926	13.7	9.0
1926-27	14.7	21.3	1927	15.1	9.2
1927-28	25.9	23.5	1928	13.8	10.1
1928-29	9.5	22.2	1929	14.3	10.1
1929-30	29.4	23.5	1930	15.3	(b)
1930-31	12.0 (a)	—			
1931-32	18.0 (a)	—			

(a) Estimate.

(b) Not yet available, but likely to exceed 1929 figures.

Large surplus in 1930.

14. Taking the three years 1928-30 together, it will be seen that in Brazil, in spite of a short crop in 1929, there was, on balance, a surplus of production over export of more than 21 million bags, or very nearly one year's supply of coffee for the whole world. Such a surplus was much greater than that at any previous crisis. In April 1930 another loan was negotiated, to provide for the sale of 16½ million bags over a period of 10 years, the coffee being held by the creditor banks as security for the loan, and planters receiving an advance of £1 per bag.

15. The 1930-31 crop is estimated at 12 million bags. At the time of the loan, the probable crop for 1931-32 was taken at 14 million bags, but that crop, now ripening on the trees, is likely to exceed the estimate by at least 4 million bags. Even if exports remain at the 1930 figure of 15 million bags, production and export in 1931 and 1932 would only just balance, and the 1928-30 surplus of 21 million bags would remain to be disposed of.

Measures for disposal of surplus.

16. The Brazilian Government has accordingly decided to extend the 1930 scheme by purchasing all the remaining stocks of coffee retained in Brazilian warehouses on June 30, 1931, except the stock already hypothecated under the 1930 loan. These stocks together with those to be disposed of under the 1930 loan will be sold over a period of ten years. Apart from the regulated disposal of this surplus, coffee harvested after June 1931 will be allowed to enter the ports freely up to a quota of 1/24th of the combined total of the crop for that year and an estimated total of the crop for the year following.

17. With exports on a basis of 15 million bags per annum, and a surplus from 1928-30 of 21 million bags to be disposed of in 10 years, it follows that in the absence of a much wider market (which would involve a marked change of taste in many consuming countries) a balance between Brazilian production and export after

1932 will only be possible on the condition that the average annual crop is well below 15 million bags. It is, however, unlikely that production will be kept within a figure that is below that of the average for the quinquennium prior to 1927-28 — all the more so as a very large number of trees recently planted will be coming into bearing in 1932.

18. The Brazilian Government propose to provide against the contingency of large crops supervening before the original surplus has been worked off, by imposing a tax in kind on all coffee produced after June 1931, to be collected at the ports.† The rate, for the first year at least, will be 20 per cent. The method of disposing of the coffee so collected is not yet determined. It has been suggested that it may be offered at cost price in East European and Asiatic markets where the demand for coffee is at present small.*

19. In paragraph 17 it was pointed out that in the absence of wider markets the average production for ordinary export should be kept well below 15 million bags while the present stocks are being liquidated. With the tax of 20 per cent., in kind, this level of export might be maintained with an average production of about 16 million bags. But the average crop for the five years 1926-30 exceeded 18 million bags. Total world consumption of coffee expanded in the same five years by some 3 million bags, and there are at present no indications that this rate of expansion will be appreciably increased in the immediate future.

20. It is evident from the foregoing analysis that the balance of probabilities on which the future equilibrium of Brazilian production and export depends is so fine that the question whether it will be maintained must remain in doubt. On two occasions during the period 1925-30, the Brazilian crop exceeded 25 million bags, and a single crop of this magnitude in the next ten years would seriously, if not irremediably, jeopardize the present scheme. Nor can it be assumed that such an event is in the least unlikely.

IV. THE FALL IN WHOLESALE PRICES

21. Although Brazilian coffee does not find a large sale in the United Kingdom, we have described the Brazilian position in some detail, since it necessarily influences the prices of Brazilian coffee on the world market, and it is inevitable that the prices at which so large a proportion of the world supply is sold must influence those obtained for coffee of other origin. Even the high grade

Influence of
Brazilian
prices on
those for
other coffees

† According to later information, this has been replaced by an export tax of 10/- per bag.

* According to a despatch in *The Times* of May 13th, 1931, the Coffee States Council has started purchasing coffee for destruction. On June 6th, the *United Press Association* reported from Rio de Janeiro that a beginning had been made by the destruction of 5,000 tons (85,000 bags) which had been taken out to sea and sunk. It has since been reported that 1,050,000 bags have been exchanged against wheat with the Federal Farm Board.

"mild" coffees—which on account of quality follow a price level and satisfy a demand different from that which distinguishes Brazilian coffee—are affected, but the effect is both closer and more serious in the case of those grades and varieties of mild coffees which more nearly approach the price level of Brazilian.

Price levels compared.

22. In table 22 and chart A of the Appendix are set out the average annual wholesale prices in London of coffees of various origin for the years 1925-1930. The price level in 1925 was high. Since that year the general tendency has been downward. Until the end of 1929 the fall was comparatively slow, but since then it has been rapid. The effect of the fall in 1930 may be seen from the following summary.

Fall in average prices for Coffee

	Average Price 1930	Decrease in shillings per cwt.		Decrease per cent.	
		1930 on 1925	1930 on 1929	1930 on 1925	1930 on 1929
	s. d.				
Costa Rica	115 0	46	24	28	17
India	86 0	54	41	38	32
Tanganyika	77 9	47	38	37	34
Kenya	77 6	54	38	41	33
Uganda, Arabica	63 6	54	35	43	36
Brazil—					
Santos Superior	56 4	53	40	48	42
Rio No. 7	40 0(a)	54	33	43	45
Uganda Estate					
Robusta	37 0	29(b)	45(b)	44(b)	55(b)
Bukoba (Native) (c)	28 0	58	32	67	53

(a) New York Spot.

(b) 1930 on 1927. Prior to 1927, prices for the two varieties of Uganda coffee were not distinguished in price records.

(c) Bukoba prices are those ruling at the end of the year.

Better qualities proportionately less affected.

23. The coffees in the preceding table fall into two broad price groups. The first four—Costa Rica, India, Tanganyika and Kenya—represent the better class "mild" coffees; the remainder—Bukoba, Uganda Robusta, and the Brazilian, represent the cheaper coffees, while Uganda Arabica falls in between the two groups. As compared with 1925, the prices for all coffees in 1930 showed very similar decreases, and with the single exception of Costa Rica the decreases in 1930 as compared with 1929 were severe. There has therefore been a general similarity in the price movement of all kinds of coffee. If, however, these decreases

are looked at in the light of percentage falls, a marked difference is noticeable between the two groups. With the exception of Costa Rica in the first group, the prices within each group have fallen by strikingly similar proportions. The percentage fall has been less severe in the first group than in the second. While the prices of coffees of all origins tend over a period of years to move in general sympathy, the effect of a slump in Brazilian prices is more directly felt by the coarser varieties of "mild" coffees such as the Robustas, which are nearest the Brazilian in the price level. The finer grades show a similar tendency. Those are least affected which enjoy the highest premium over the price level of Brazilian. In a word, quality tells.

24. This is of the first importance when coffee producers within the Empire have to consider the effect on their industry of a further fall in the price of Brazilian coffee, such as might follow either another bumper crop or a change of policy from the present scheme to one of unconditional release of stocks. All grades would be affected, as in the recent slump, but the better grades would suffer less in so far as they supply a demand which is distinct from that for Brazilian coffees. The difference in flavour between the two types is so marked as to form a difference in kind rather than degree, and in the opinion of competent judges, those markets which are buyers of "mild" coffees will continue to buy them no matter how low the price of Brazilian coffee falls, while the influence of Brazilian prices would be indirect rather than direct. In fact, the demand for mild coffees has steadily expanded in recent years. On the western sea-board of the United States of America, for example, where the taste of consumers in regard to liquoring flavour and degree of roast tends towards that of the United Kingdom rather than that which prevails elsewhere in the United States, there has been an increasing demand for good medium grades of East African coffee, for which, in the spring of 1931, enquiry has been brisk up to a price level of about 80 shillings a cwt.

25. The position of the lower grades, however, is much more insecure. As can be seen from the prices shown in table 22 of the Appendix, the prices for Uganda Arabica appear to move with Santos Superior, while the Robusta Coffees—Uganda and Bukoba—are in close correlation with Rio No. 7. In the case of these coffees, particularly the Robustas, which have to compete in price not with other mild coffees, but with Brazilian coffees in very large supply, a further fall in Brazilian prices may easily bring these grades down to an unprofitable price level, and they might even fail to find a market.

Lower grade
less secure.

26. It is, therefore, of the utmost importance that, wherever any expansion of Empire coffee production is contemplated, these factors should be taken into account, and close attention paid to the developments in Brazil and the measures there adopted. Whether

Brazilian prices may decline further, and how far, it is, of course, impossible to estimate. In the slump of 1900, when Santos Superior was selling at 22s. a cwt., the price of Costa Rica coffee ranged between 60 and 80 shillings.

Large proportion of Costa Rica offerings comes within the 'A' grade.

27. In the preceding paragraphs, the figures quoted are average annual prices of coffees of different origin, and therefore give no idea of the range of prices in the market between different grades of coffee of the same type. Such ranges may be wide. For example, in one agent's list of current auction prices, taken at random, the prices of Kenya coffee ranged from 129s. a cwt. for one parcel of "A" grade, down to 29s. a cwt. for a parcel of "C" grade, and even within the "A" grade, the price for a small parcel was as low as 65s. One reason for the high average prices attained by Costa Rica coffees is the comparatively high proportion which falls within the "A" grade. A comparison of these lists showed the proportion of Costa Rica coffee falling in Grades A, B and C respectively, to be 86, 12 and 2 per cent., while the corresponding figures for Kenya coffee were 58, 30 and 12 per cent. Thus, although some of the best "breaks" of Indian and Kenya coffees approach Costa Rica prices, the average, particularly in the case of Kenya coffee, is brought down owing to the greater variations between the crops of different estates, and to the larger proportion of B and C grades to the total marketed. If, as is generally maintained, it is chiefly the best Costa Rica Coffee that comes to the London market, it should follow that this represents a very considerable proportion of the total crop, since in 1929, of the total exported, 72 per cent. came to London, and of the remainder Germany (which is a large importer of the high grade Costa Ricans re-exported from London) took 15 per cent. direct. As we have pointed out elsewhere in our report, the proportion of high grade Costa Rica coffees to the whole is partly due to climatic conditions, but the price level attained by these coffees is in itself an encouragement to Empire growers in so far as it clearly demonstrates that even in times of severe depression the London market is prepared to pay for the best grades of mild coffees a price that should be profitable to growers in all producing countries.

International Action.

28. The pressure of Brazilian coffee production and stocks on the world market, and the fall in prices in 1930, led, as has been the case with other crops, to suggestions for international action in the interests of producers. At the International Congress on Tropical and Sub-Tropical Agriculture and Coffee, held at Seville in the autumn of 1929, a proposal was made to establish an International Coffee Bureau, which should have the following objects:—

- (1) To study the problems of the coffee industry from the point of view of production and consumption.
- (2) To study problems relating to transport and custom duties.

(3) To compile detailed statistics of production and consumption.

(4) To organise a world campaign to promote the consumption of coffee.

(5) To found a periodical organ, to be published in various languages, as a means of bringing together all interested parties.

(6) To organize periodically an international congress of representatives of coffee producers and consumers.

The Bureau was to be supported by contributions from the countries acceding to it, in proportion to their importance as producers or consumers. As is indicated elsewhere in our Report, the regular compilation and distribution of more authentic and detailed statistics concerning coffee than are at present readily available, would be advantageous to producers and the trade. No progress, however, has yet been made with the proposal for the International Bureau, except an agreement that if the Bureau is established the headquarters would be in Madrid.

In the spring of 1931 the Brazilian Government initiated an International Coffee Congress at San Paulo, to review the world coffee situation, and consider the possibility of international action among producers to restore the equilibrium between supply and demand.

V. CULTIVATION AND PREPARATION

29. The coffee tree is a fruit tree and the coffee bean is the prepared seed or "stone" of the fruit. In form and colour the fruit is not unlike a large cherry and is commonly so named. Coffee flourishes in tropical climates having a considerable but well-distributed rainfall. There are three main varieties—*Arabica*, *Robusta* and *Liberica*—which differ in size of cherry and bean, in frequency of bloom and in resistance to disease. The *Arabica* is usually grown at elevations between two and five thousand feet, while *Robusta* and *Liberica* are grown from two thousand feet down to sea level. In quality the *Arabica* is by far the best, and is the most widely cultivated although it is the most liable to disease. Of the coarser varieties, *Robusta* has in recent years been successfully exploited in the Netherlands East Indies, where the ravages of disease drove the planters to seek for an alternative to the "Old Java" *Arabica*. It is also grown in Uganda and Tanganyika Territory. Under special conditions *Liberica* coffee has become an established crop in certain low-lying districts in British Guiana.

30. The tree comes to maturity at from three to five years. Like all fruit trees, it is liable to very wide variations in yield from one season to another. A yield of 5 to 7 cwts. per acre is considered good, but over a series of years the average for well-matured

Varieties.

Fluctuations in yield from one season to another.

plantations is considerably less, and in an exceptional season it may be considerably more. We were told of one estate in India where the total crops varied from 10 to 100 tons. Fluctuations such as these, due to natural causes, show the extreme difficulty of any close adjustment of production to consumption in a fruit crop such as coffee.

Preparation
and curing.

31. The coffee cherries are fed through a water channel into the pulping machines which remove the outer layer of fruit and filament from the bean—the channel being so arranged that a large proportion of light and under-ripe cherry is floated off for separate treatment. From the pulpers the beans, coated with their mucilaginous covering, are carried down another channel to the fermenting tank, where they are spread and left to ferment for periods which vary according to climate and temperature. (The latest development is a pulper in which the cherry is pulped under a high water pressure. This removes the mucilaginous coating of the bean and renders fermentation unnecessary.) When fermented, the beans are next thoroughly washed and spread out to dry on cement floors or barbecues, or, where there is a risk of rain, on layers of trays which can be run back into a central shed, or by means of artificial driers. In Costa Rica the washing process is carried out by shovelling the coffee against the flow of water in a channel in such a way as to effect a preliminary separation of the coffee into grades by gravity.

32. After drying, the "parchment" coffee is ready for the cleaning, "hulling" or "curing" process, in the course of which the parchment and pellicle or "silverskin" are removed from the bean. It is a matter of convenience whether this is carried out before or after shipment. By cleaning in the country of origin, there is a saving in freight on the parchment removed in the process. On the other hand, coffee which is cleaned shortly before sale may command a premium on account of its fresher appearance. Occasionally it may pay the planter to get his coffee shipped and away, rather than wait his turn at the curing mills. A considerable trade in coffee curing is carried on in London. In particular there is always a strong demand on the Continent for *London-cleaned* Costa Rica, on account of the fine appearance of the bean, part of which is due to the excellence of the work performed in London. Indian planters, however, prefer to have their coffee cured at local works on the coast before shipment, partly for convenience and partly because they consider that the high polish of the London process impairs rather than improves the liquoring quality of their coffee. In Kenya, most of the crop is locally cured, with satisfactory results. In the case of Kenya coffee it is doubtful whether the bean at present produced has enough "colour" in it to make it worth while to incur the extra freight for having it London cleaned.

33. The great bulk of Empire-grown coffee is "pulped" by the "wet" process as above described. The preparation of Brazilian coffee, however, differs in so far as the coffee, instead of being pulped in this way, is dried in the cherry. It is interesting to note that a considerable proportion of Indian coffee is also dried in the cherry. Indian coffee so prepared is said to have a sweeter smell and softer taste than that prepared by the wet method. The bulk is exported to France, where it commands a good price. It is also appreciated among connoisseurs in India, including the planters themselves. Part of the cherry-dried coffee is purposely kept in India over the Monsoon, which further softens it. This "Monsooned" coffee, as it is called, obtains a slight premium over the remainder of the cherry-dried Indian crop. It finds a special market—and, it is claimed, an expanding market—in France, Switzerland, Holland, Germany and Scandinavia.

34. After hulling, the beans are graded through sieves or Grading. "screens" into sizes. The following are the usual grade names on the London Market—the terms differing with the country of origin:—

- (1) Elephants—or "oversize".
- (2) A, bold, or No. 1.
- (3) B, medium, or No. 2.
- (4) C, thirds, or No. 3.
- (5) Triage, or Chips, i.e. broken beans.
- (6) Peaberry (an elliptical undivided bean).

In India, particular care is taken over the removal of defective beans. After the machine grading, the coffee is "garbled," or hand-picked to ensure that the principal grades are free from defective or broken beans, which are thus separated out and marketed in the "Triage" grade.

35. When the flower is completely fertilized, the coffee fruit contains two beans. When only one bean develops, it is known as "peaberry". Being elliptical, instead of flat on one side, the "peaberry" rolls easily in the roasting machines and roasts more evenly than the ordinary flat bean. On this account it may obtain high prices in spite of its comparatively small size. Parcels of "peaberry" should, however, be true "peaberry" throughout.

36. Such are the grades of mild coffees. Brazilian coffee, being a bulk crop which is sold by sample and on description is also elaborately classified into some 8 or 9 "types" according to the number of "defects" in a sample of given weight. For instance, the standard Santos Type No. 4 is allowed up to 30 "defects" in a sample of 450 grammes. (There are intermediate classifications between each standard type.) Each type is graded by size into

“smalls,” “mediums,” “large,” etc., as are mild coffees, and if of good quality may be “cup-tested” to determine if it is “soft” as distinguished from the “hard” or bricky taste of the inferior qualities. The buyer may also specify that it will roast according to his requirements, by the terms, “fair roast,” “good roast,” etc.

VI. COFFEE PRODUCING AREAS IN THE BRITISH EMPIRE

37. Of the principal coffee producing areas in the Empire, the two older areas, India and the British West Indies, already find a market for the greater part of their crop outside the United Kingdom. Indian coffee is finding an expanding market in India, which now absorbs between 20 and 25 per cent. of the crop. Of the export, between 20 and 30 per cent. comes in the first instance to the United Kingdom, which however retains only about one half of the amount imported. The remainder of the coffee export from India goes chiefly to the continent of Europe. From the West Indies, the United Kingdom takes nearly the whole of the famous “Blue Mountain Jamaica” coffee (now in small supply) but of the total export from Jamaica and Trinidad between 70 and 80 per cent. goes to Canada. East African coffee, the production of which has expanded rapidly since the war and is still expanding, comes for the most part to the London market, and is making its way steadily not only in the home trade but also in the re-export trade of the United Kingdom.

(A) *India*

Increasing importance of the home market in India.

38. Coffee production in India is confined to the South, more than half the crop coming from the State of Mysore, and the remainder from Madras, Coorg, Travancore and Cochin. The area under coffee in 1930 (excluding plantations of less than 10 acres) was 163,000 acres, an increase of 14 per cent. over the figures for 1925. Exports for the fiscal year 1929-30 were 198,000 cwts., compared with the average of 218,000 cwts. for the previous quinquennium, and 260,000 cwts. in 1913-14.

39. Exports are, however, no longer in themselves a measure of the position in Indian coffee, as the demand in the country of production has now reached considerable proportions. It is estimated that on an average about a quarter of the crop is now retained in India for home consumption. The two following tables show the surplus available for home consumption (1) of home produce (2) of imports. In the first table, the export figures given are for the period July to June, so as to bring them into relation with those for production.

(1) *Production and Export of Indian Coffee in thousand cwts.*

12 months ending 30 June	Production	Export	Surplus available for home consumption
1925	272.1	251.9	20.2
1928	317.5	260.9	56.5
1929	247.8	142.6	105.2
1930	352.0	243.0	109.0

(2) *Re-exports from India of imported coffee in thousand cwts.*

12 months ending 31 March	Imports	Re-exports	Surplus retained
1925	26.8	5.2	21.6
1929	44.9	4.5	40.4
1930	57.1	9.1	48.0

On these figures the consumption of coffee in India in 1930 was approaching four times the amount consumed in 1925.

(B) *East Africa*

40. In the territories which now comprise the British East African Dependencies, coffee was produced before 1913, but the development which has followed the influx of new settlers and capital into Kenya Colony and Tanganyika Territory since the war is one of the most interesting in the recent history of the Empire. The total coffee export from these territories has increased from 2,000 tons in 1913 to 30,000 tons in 1930. In Uganda and Nyasaland there have been fluctuations due to climatic causes, but in the highlands of Kenya and Tanganyika there has sprung up in the last few years what is really a new and promising industry. The following tables show the progress made.

Rapid increase of production in East Africa.

(1) *Area under coffee, in thousand acres*

—	Kenya	Tanganyika	Uganda	Nyasaland
1922	43	(a)	25	.3
1925	65	82	20(b)	.8
1929	90	105	36	1.3

(2) *Exports in thousand cwts.*

1922	78	85	51	.8
1925	147	120	30	.2
1929	133	177	41	.9
1930	310	231	49	1.0

(a) Not available.

(b) Under a revised system of computation.

Further increase possible when price levels recover.

41. A further increase may be expected in the near future, not only from the coming into full bearing of the more recently planted acreage, but from the extension of areas planted. Uncertainty as to the future of coffee prices may retard development, but both in the proportion of proved coffee areas actually broken up, and in the proving of fresh areas suitable for coffee, there is still room for expansion, and it is expected that as price levels become more stable, an increasing amount of coffee from British East Africa will be coming on the market.

Steady progress in public favour in spite of difficulties.

42. The rapid advance of British East African coffee has been made on its own merits, and in spite of all the difficulties attendant on pioneer work. In some degree, times were favourable. Development of production coincided with the grant of a preference in the United Kingdom—now 2s. 4d. a cwt. Further, the London market, always on the look-out for new supplies of the superior coffee on which it has built up its home and re-export trade, found not only that the general level of the coffee from these new areas was good, but also that the higher grades possessed precisely those qualities of sharpness or “bite,” without harshness, which distinguish the best of the mild coffees. Mild coffees are in limited supply. Those produced in certain of the older areas were considered to have lost some of their “bite,” and the new British East African coffees were all the more welcome. Moreover, while the best grades were soon competing with the finest mild coffees from Central America, the artificial price level of the top grades of Brazilian coffee gave an opening in the re-export trade to the lower grades from British East Africa, since they were obtainable at a price which made them attractive to buyers, and have steadily increased in favour. The results achieved are the more remarkable in the light of the difficulties with which the planters in East Africa have had to contend. Some of these difficulties are climatic and inevitable; others, which are inherent in a new enterprise, they may in time be able to overcome. Among the climatic difficulties, especially in Kenya and Tanganyika, is the liability to uneven rainfall or drought. Kyambu, for example, has an average of 40 inches, as compared with the 80-inch average of Costa Rica. In Upper Kyambu, while the average is about 53 inches, the variations are wide, as can be seen from the following records:—

1921	...	...	42.03	1925	...	...	48.88
1922	...	...	64.47	1926	...	...	50.98
1923	...	...	91.59	1927	...	...	40.67
1924	...	...	38.01	1928	...	...	46.18

In 1929, the average for the district rose again to 52.82, but the distribution was uneven, the early part of the season being very dry and the latter part very wet. The success of a coffee crop depends very much on having rain at the right time and no rain

at the right time, and these variations in rainfall naturally affect both the quantity and the quality of the crops.

43. Compared with the best East India or Costa Rica bean, the bean produced in Kenya is liable to be handicapped in the market on account of its small size. It is now recognised that at any rate in the case of the higher grades, this does not impair its liquoring quality, and buyers for the home trade in the United Kingdom, who pay close attention to liquoring quality, make allowance for this fact. For the continental market, however, the small size of the Kenya bean is a disadvantage. It is noteworthy that in Tanganyika, where a different variety of Arabica seed is employed, the bean is bolder. How far the size of bean is a matter of seed, soil, or climate, is a problem that might repay systematic investigation, and we return to it in our consideration of research into the agricultural problems of the industry.

Small size of
Kenya bean.

44. In the matter of grading, East African producers, and especially those in Kenya, are at a disadvantage owing to the estates being for the most part small in size and scattered. The average estate covers between 150 and 200 acres under coffee. In Kenya there are few coffee estates of over 500 acres. In contrast, estates in Guatemala cover on an average between 1,000 to 2,000 acres, and in Costa Rica, although the estate may not have more than 500 acres under coffee, it will receive large quantities of cherry from the small holders in the neighbourhood. These sell their coffee to the "Beneficiador" who cures it, grades it out, mixes it with his own and sends it all out under his own mark. The large acreage serving each factory means a large crop for each factory to deal with and facilitates both the employment of more elaborate methods and machinery, and the extraction of a larger number of grades. In Costa Rica each of the sizes A, B, C, etc., is divided into classes, the coffee being gravity graded in the washing channels so that the heavier (and better) beans are separated out. By this method the top classes contain only the best beans. It is recognised that factory methods in Central America are at present far in advance of those employed in the factories in British East Africa, some of which are necessarily of a very simple character, since the acreage and capital invested in each estate are comparatively small. Costa Rica methods — methods be it noted, that have an important bearing on the uniformity in quality of Costa Rica coffee and the price which it obtains in the market — would not be possible in handling the crop of an individual estate in East Africa. Some kind of co-operation between estates would be required.

Need for
co-operation
in grading.

45. In addition to the general improvement in the various processes which would be possible by means of larger scale operations, there is the further advantage that if, by co-operative curing and grading, coupled as far as possible with co-operative preparation,

the coffee could be graded for quality (as well as size) and sold as Grade I, II, and III, the progress of East African coffee in foreign markets would be facilitated and its position in the United Kingdom market would be strengthened, while there might well be a saving in trouble, time and expense. Buyers would be able to purchase their 500 or 1,000 bags of a particular grade, as they do in the case of Costa Rica coffee, confident that the general standard would be the same throughout. If such grades were established, a shipper would know where to find 500 bags of a given grade to meet an order for, say, South Africa, and be able to certify that they were all of the required standard. It would also be possible to organise the distribution of the crop to the appropriate markets, reserving the better grades for the markets where they were most in demand. As London Agents already maintain tasters in East Africa for special purposes, it should be possible for a co-operative organization, or Government to maintain them on a larger scale. If it is possible for Central and South American coffee to be tasted before shipment, it should be no less possible to do so for the East African product.

Advantages
of standard
grades.

46. It should be noted that at present, although the grower's identity is maintained as far as Mincing Lane, it goes no further, the coffees of individual " marks " being blended before they are retailed. If standard grades were established, the retail purchaser would learn to recognise them, and collective advertising, through such channels as the Empire Marketing Board, would be facilitated. Such standard grades would automatically protect the reputation of the better grades, and indirectly the general trade name, by preventing coffees of varying qualities being sold, without distinction, under one generic name. At present, grades of Kenya coffee which are properly suitable for blending are sometimes retailed for drinking " straight " or unblended, whereby the good name, not only of the superior grades but of Kenya coffee as such is prejudiced. As it is, some careful planters endeavour to maintain the reputation of their " marks " by selling their inferior grades under a different name but, as we have pointed out, the protection is effective only in the wholesale market. Standard grades would achieve the same end by a simpler process and on a larger scale.

47. It may be added that co-operation need not involve loss of identity in the wholesale market. The produce may be graded, either through a producers' society or by Government authority, as coming up to a given standard, and the estate still be free to affix its own estate " mark ". Such a method may be preferable where the desire is strong to maintain identity. Co-operative grading is already being successfully employed in the marketing of native grown coffee, and while it is more easily applied in the case of Robusta coffee, which is a bulk coffee sold on types, similar methods should be useful in improving the marketing of the Arabica varieties.

48. All the evidence we have had before us agrees on two points:—first, that co-operation would not be easy to achieve, and secondly, that if achieved it would confer most material benefits on the planters in the marketing of their produce. The industry in East Africa has been created by the energy of a number of settlers, each working in his own way, and on a comparatively small scale. It may be that to the strong individualism which has been the mainspring of that energy, co-operative methods would have small attraction. But the fact that the industry is yet young, and the planters alert to the advantages of experiment, should make it less difficult of achievement than in countries where established methods have acquired the fixity of tradition. It has been put to us on good authority that the improvement in the preparation and curing of East African Coffee, and the equally important object of maintaining a regular standard from year to year, are most likely to be achieved by means of co-operation to establish standard grades.

It is impossible to ignore the fact that coffee producers are passing through, and must envisage, a period of keen competition. In such periods, efficient marketing methods may mean to many planters all the difference between extinction and survival, and if these methods are not attained through joint co-operative action, they will be enforced through the hard economic pressure of amalgamations and sales. In all schemes of co-operation, local conditions largely govern the possibilities of success, and we urge the planters to consider the problem with an open mind and to regard the experiment as one which is neither to be rejected out of hand nor adopted without close examination.

49. In one particular there appears to be room for an improvement which could be effected without any radical change in the existing system. All curing factories vary in the choice of screens or sieves through which the beans are passed and graded into sizes. Even in Costa Rica there is no absolute standard of mesh for the several grades. On the other hand, from the point of view of the market — and the producer must necessarily study the market point of view — not only should all the coffee sent to market as size A, B or C, in one parcel, be true to type, but also what is offered as size A, B, or C in one year should not differ from what was so offered in another year. Unfortunately the practice exists in certain curing mills in East Africa of altering the sizes of the sieves from year to year, and even in a single season, at the discretion of the managers of the mills. When the coffee is on the small size, they will insert smaller sieves into the graders so as to retain a more or less definite proportion of A, B, and C sizes in the "breaks" — from a fear that otherwise the planters would be penalised when their coffee happened to be small in size of bean. In fact, this practice has the precise effect which it seeks

to avoid. The buyers — who must be credited with a knowledge of their business due to long experience — find that they cannot be sure, from parcel to parcel, of what kind of sizing they are going to get. The sizes are in consequence sharply examined, and the grower is, in fact, penalised in consequence. In some cases, we were informed there has been a mixing of B and C sizes in the same parcel. It is important to realise that such practices, while failing to deceive, do in fact tend to create prejudice among the very people who are anxious to promote the progress of these coffees. We have been informed on good authority, and from different sources, that so far from penalising planters, it would ultimately be very much to their advantage if, by general agreement through their local associations, or by other authority, the grade sizes of sieves in the curing mills were definitely fixed and not altered except by similar sanction. It should not be difficult to arrive at such standards, possibly by means of an interchange of views between the planters' representatives and the Coffee Trade Association of London.

(C) *British West Indies*

Cultivation
by small
growers.

50. In the British West Indies coffee cultivation is mainly in the hands of small growers. Except for a small part of the Jamaican crop, the varieties grown are principally types like Robusta, which, though inferior to Arabica, are better suited to local conditions of climate, altitude and husbandry. Coffee growing has been encouraged in recent years through the distribution by the authorities of large numbers of plants. It must, however, be recognised that this bulk coffee is necessarily exposed to competition arising from the great production in Brazil, and success will depend on the degree in which quality can be maintained together with low production costs. In Jamaica the Produce Protection law is reported to have had a marked effect in improving methods of preparation, and equally important in promise for the future is the success which has so far attended the experiments in co-operative selling in Jamaica.

"Blue
Mountain"
coffee.

51. Distinct from the coffee grown in the lowlands, Jamaica also produces a smaller and much superior crop in the highlands, including the famous "Blue Mountain Jamaica," an Arabica variety universally recognised as the finest coffee in the world. This is an old established coffee, and unfortunately there has been much difficulty in maintaining some of the plantations, which are exposed to the effects of hurricanes and soil erosion on the steep slopes of the district. While every effort has been made in recent years to combat these difficulties, and some success achieved, e.g., by mulching, the supply of "Blue Mountain Jamaica" coffee is now limited, the only compensation being that competition among buyers is correspondingly keen, and a high price level

— averaging about 200s. a cwt. — is steadily maintained in the London market, which takes practically the whole crop.

52. Apart from this special crop, very little West Indian coffee is taken by the United Kingdom. Canada, which maintains close trading relations with the British West Indies, has been taking an increasing proportion of their coffee export. Of the remainder, the United States is the largest single importer. The following table shows the exports in recent years. The figures in brackets give the percentage exported to Canada.

Canadian
share in
West Indian
Exports.

*Jamaica and Trinidad Coffee Exports,
in thousand cwt.*

				<i>Jamaica</i>	<i>Trinidad</i>
1925	...	...	...	104.0 (77)	5.3 (16)
1927	...	...	...	81.7 (81)	1.5 (73)
1928	...	...	...	78.9 (84)	2.4 (55)
1929	...	...	...	59.0 (89)	7.3 (76)

(D) *British Guiana*

53. In the present century there has been an interesting revival of coffee growing in British Guiana, where it had declined rapidly after the abolition of slavery in 1838, until by 1846 exports were negligible. There are large areas in the Colony suitable for the cultivation of varieties of coffee that are hardy and will thrive at low elevations. Liberica coffee, which fulfils these conditions, has now superseded other varieties, although in quality it has to compete in the world market with the lower grade bulk coffees. In a country where coffee is essentially a small holder's crop, and where additional help is not readily available when needed in the picking season, Liberica coffee has the special advantage that the berries can remain on the tree, when ripe, for a longer period than is the case with other varieties. In spite of the difficult and primitive conditions under which the small farmers have to work, they have succeeded in re-establishing coffee cultivation and in finding a market for the produce which is rapidly becoming an important export crop in the Pomeroon and North-West Districts. The total area under cultivation in British Guiana has grown from 700 acres in 1905 to 6,000 acres in 1928, while the exports in the same period have increased from 3½ cwt. to 8,000 cwt. valued at £28,000. The whole of the export now goes to Holland and Norway (see Appendix, Table 6).

Local
conditions
suitable for
Liberica
coffee.

54. The value of the Liberica coffee exported from British Guiana during the period 1901-1928 has varied from 17s. to 72s. a cwt., with an average of 24s. a cwt. Land is available at nominal rents and prices in the North-West District, where cost of picking and preparation are estimated (Agricultural Journal of British

Guiana II. 3. pp. 150-51) at 38s. a cwt. With the low levels of world prices now ruling it is evident that Liberica coffee is likely to be profitable only in conditions which admit of low costs of production. Although special conditions in British Guiana have made it possible to grow with success a certain amount of Liberica coffee, we should hesitate to recommend this as a precedent for other Empire countries which are in a position to grow better varieties.

VII. RESEARCH

Re-
organisation
of research in
East Africa.

55. We have to record our impression that the research work on coffee hitherto carried out within the Empire has been inadequate. Already a start has been made to remedy this defect. The re-conditioning, under a scheme of re-organisation, of the East African Research Institute at Amani is now complete, and the staff has settled down to definite programmes of research, in which work on coffee is included. These programmes have recently been under the careful consideration of the Colonial Advisory Council of Agriculture and Animal Health and also of a Conference of Directors of Agriculture in East Africa held at Amani in February, 1931. Arrangements are projected whereby the more fundamental research at Amani will be co-ordinated with the general research carried on or contemplated by the several Departments of Agriculture in East Africa. An important part of the work contemplated at Amani will relate to coffee, and it is intended to include such investigations as the following:—

(1) The soil-acid tolerance of coffee under East African conditions.

(2) Variation in established types of coffee with a view to selection of types adapted to different conditions, and a study of the periodicity of yield and factors controlling it.

(3) The genetics of coffee.

(4) The effect of shade in coffee plantations, including a study of the "carbon-nitrogen ratio" of all parts of the coffee plant in relation to its growth under varying conditions, particularly with reference to light and shade effects, and with a view to understanding the factors concerned in over-bearing.

(5) The study of factors connected with the general physiology and nutrition of coffee.

Breeding and
Selection.

56. The practical urgency of some of these topics has been evident to us in the course of our enquiry. To the problem of the size of the Kenya bean we have referred in paragraph 43. Not only is there already a number of types grown in the country, but, on the evidence presented to us, as well as on the analogy

of the research into fruit trees carried out at East Malling, it is to be expected that investigation will reveal the existence of hybridisation as the result of cross-fertilisation. It may well be that the comparatively small size of the Kenya bean is a matter of soil and climate rather than a matter of cultivation or variety, but the question is clearly one which requires examination. It is, however, essential that in any effort to improve the size of bean, liquoring quality — which is the virtue of Kenya coffee — should not be sacrificed to size.

57. In our report on tea we drew attention to the divergence of practice and opinion on manuring policies. A similar divergence has been noticeable in the present enquiry, and again points to the need for systematic research. Both among planters and among merchants there is agreement that the best results are usually obtained from virgin soil, and that both in quality and quantity the crops harvested in the first two or three years after full bearing are, other things being equal, the best on any plantation. Thereafter, there is likely to be a decline in yield. Even in the most favourable conditions, it is axiomatic that what has been taken from the soil should be replaced, but on the actual choice and use of manures there is much conflict of opinion. In the view of some merchants, and also of some planters, the superiority of natural over artificial manures is evidenced in the product, and to the use of artificial manures is attributed by some merchants the alleged decline in the "acidity" or "bite" of certain coffees, e.g., from East India. It is to be remembered that the coffee bean is the seed or stone of the fruit, and it is a question, which only systematic investigation can determine, how far manuring policy affects the quality, as well as the size, of the stone as distinct from the fruit itself, and how far manuring policy may produce size or quantity at the expense of liquoring quality.

Manurial
problems.

58. In East Africa the actual situation is that while there has been much experiment with manures by individual planters, the result is still largely *quot homines tot sententiae*, as local conditions may vary widely, and in addition it is usually uncertain how far the success of some particular policy is due to the choice of manure and how far to favourable weather conditions or other causes. In the opinion of good judges, most of these experiments are not scientifically designed, the choice of the manure experimented with by planters being not infrequently determined by the persuasiveness of trade agents.

59. The investigations enumerated in paragraph 55 have been selected for Amani by the Colonial Advisory Council of Agriculture and Animal Health, after consideration of proposals formulated by the Director of the Institute and by the Directors of the

several Departments of Agriculture, and we are informed that there may be some further adjustments in regard to details, particularly as special coffee research stations are now contemplated in both Kenya and Tanganyika Territory.

Proposals of
Kenya
Planters'
Union.

60. In 1930, a scheme for the formation of a Coffee Board for Kenya, including provision for a research institute, to be supported by funds collected from coffee growers, was put forward by the Kenya Planters' Union. The Agricultural Commission in Kenya supported the proposal in principle, and in its report stated :—

“ It recognises the very special need of the coffee industry for scientific work, and it would lay particular stress upon the necessity of plant breeding and selection and the propagation of desirable individuals by a sexual means of reproduction. Coffee plantations at present, being raised from seed, are mixtures of many types, varying in habit of growth, in disease resistance, and in productivity. By suitable investigation it is practically certain that a much greater degree of uniformity, and uniformity at the higher end of the present scale of variation, can be attained. Such work, however, demands several years' work for its realization and, therefore, a research organisation which is assured of continuity.”

61. The scheme aimed at constituting a Board on which both the Government and the planters would be represented, and at raising funds for research work and publicity by means of a cess on the planters and an equivalent contribution from Government. It was thus on the lines of that now in force in the State of Mysore, to which we refer in paragraph 66. In the early months of 1931 the matter was still under discussion.

Co-
ordination
between
Amani and
local
stations.

62. We feel that while many of the problems enumerated in paragraph 55 above, which involve long range research, can best be carried out at the Research Institute at Amani, work on selection of types suitable for different soils, climates and altitudes, on general problems of crop husbandry, on pests and diseases, and on the selection of high yielding strains, should be carried out at the Research Stations contemplated in Kenya and Tanganyika Territory, in co-operation, when necessary, with the Amani Research Institute. It is clearly desirable that the coffee industry in East Africa should be encouraged to make provision for research, but it is also desirable to effect the closest possible co-ordination of the work contemplated, both in order to prevent over-lapping and also in order to adapt policies to the widely varying conditions of different localities.

Need of
adequate
financial
support.

63. There is a vast field of research work to be covered on behalf of the coffee industry in East Africa, and financial support will be required if it is to be made thoroughly effective. We understand that the Research Institute at Amani has not adequate funds to

provide the full staff originally contemplated, and that assurance of finance, even on the present scale, is not certain. Satisfactory research work cannot be undertaken if there is any insecurity in regard to finance, and we trust it will be possible to provide adequate funds both for the Research Station at Amani, and for those stations which are required in both Kenya and Tanganyika Territory for the solution of problems of more immediate concern to the estate managements.

64. The Departments of Agriculture in East Africa have been called upon, in the past, to carry out a considerable amount of research for the coffee industries, particularly in regard to pests and diseases. The importance and value of this work is recognised by the industries themselves, but it has been indicated to us that a greater dissemination of the information available is required and that an extension of the advisory services is desirable. In particular, we would wish to call attention to the possibility of planters meeting regularly, and thereby providing a means for the dissemination of technical information on agricultural matters.

Need for better dissemination of results.

65. Our attention has also been drawn to the fact that when sketches of the life history of coffee pests are circulated, their value to the planter would be very greatly enhanced if he were able to see his enemies portrayed in their natural colours, rather than in black and white. We understand that the importance of publishing such sketches in colour is under the consideration of the Departments concerned and that planters would willingly purchase them.

Value of colour in sketches of coffee pests.

66. In India, where the industry is much older, a certain amount of research work has been carried out in the past, but this has, for lack of organisation and of special staff, necessarily been of a tentative and scattered nature. Research is, however, now being definitely organised. The United Planters' Association of Southern India maintains a small service, the Agricultural Department of the Mysore State has established a Research Station for the special study of coffee problems, and recently all agricultural research work in India has been co-ordinated under the Imperial Council for Agricultural Research.

Development of research in India.

In fact, research work on coffee in Mysore was begun as far back as 1898, and thereafter much valuable pioneer work was carried out, under difficult conditions, but the need was soon felt for a more fully developed research station and a whole time staff. As a result of the efforts of these early workers, research into coffee was placed on a better footing when, in 1928, legislative sanction was given by the Government of the Mysore State to a scheme of coffee research whereby a cess of two annas per acre is levied on all coffee estates over fifteen acres in area. This cess is supplemented by contributions from the State of Mysore and also from the United Planters' Association of Southern India, who maintain a special

Research Officer. A research station has been established at Balehonnur in the heart of the coffee districts of Mysore, containing established coffee of various ages and land available for new plantings. Laboratories and buildings have been erected, and work has begun on a definite policy.

67. The programme, as approved in 1928, included the following subjects of investigation :—

- (1) The manurial requirements of coffee.
- (2) Improvement in vigour, quality, and disease resistance through selection and hybridisation.
- (3) Coffee diseases — especially black rot and root rot.
- (4) Insect pests, especially the Green Bug and the Coffee Berry Borer.

Problems of cultivation and shade are not considered of such immediate practical urgency in India as they are in new areas such as East Africa, and it is the aim of the Indian research stations to avoid the danger of undertaking more problems than the available staff and funds can cover satisfactorily.

Manurial
problems in
India.

68. From the very beginning much attention has been paid to the question of the best manures for coffee. The problem is complicated by two disturbing factors.

In the first place all coffee in South India is grown under shade provided by trees of various kinds. This is essential to maintain a moist atmosphere and to protect the coffee during the long hot dry period experienced even at elevations of 2,000 and 5,000 feet. The fallen leaves from these shade trees rapidly accumulate on the ground and produce a thick mulch, often six or more inches deep, in which the surface feeding roots of the coffee luxuriate. This mulch is of considerable value, but its existence renders difficult both the interpretation of results and the application of them in practice.

The second disturbing factor is physiological. Coffee in South India flowers and bears only once in the year. The flowering occurs in April or May and is dependent upon the early rains after a long dry period. The first showers bring out the coffee blossom in a few days and if they are insufficient in quantity or unduly delayed the blossom may be profoundly affected. The blossom only lasts for three or four days and if heavy rain falls on it during the time it is open, the resulting crop may be adversely affected. Coffee is fertilised mainly by bees and other insects and if dull weather occurs during the time the blossom is open these insects may not visit it freely, and again the final crop is adversely affected. This physiological factor is so great that it may entirely mask any results likely to be obtained from manures.

69. The consequence is that manurial experiments must be carefully planned and constructed, and continued over long periods of time before any really reliable results can be expected or obtained. From paragraphs 43 and 56-57 it is clear that the investigation of manurial problems, from the point of view of size and quality of bean as well as of crop yield, is of great importance for coffee growers. In what may prove a long task, those engaged in the work both in India and East Africa will benefit by keeping in touch with one another and also by watching the progress of work in other parts of the field, such as the extensive nutritional experiments on fruit trees which have been carried out in recent years at Long Ashton.

Need for keeping in touch with research elsewhere.

70. The investigations into coffee diseases prevalent in India have already established the value of spraying for the control of Black Rot and Leaf Disease. Where such spraying has been adopted on a large scale it has been found that the crop has increased by an average of 2 cwts. an acre, at a cost for spraying of less than the value of half a hundredweight of coffee. It need hardly be added that planters are eagerly availing themselves of so practical a result of scientific aid to industry, and the number of acres sprayed in 1930 is said to be ten times the number sprayed three years previously. An equally effective dust spray would be of great service for use on these estates where water is scarce at the time of year when spraying must be carried out, and where transport of water from a distance adds seriously to the cost.

Spraying.

71. With a perennial crop such as coffee, breeding experiments necessarily take a long time, and it is estimated that the period required for attaining the most valuable results may be from 10 to 20 years. It is all the more satisfactory that a start has been made, and on a carefully considered plan which will be consistently adhered to. At the close of 1930, about 15,000 trees, raised from the seed of selected parent trees, had been planted out in the experimental plots; as material for selective breeding.

Selective breeding.

72. The prospects of improving coffee by means of selection of seed and hybridisation are promising. In the past, very little care was taken in selecting seed for the preparation of nurseries either to replace worn out plants or for planting up new areas. In consequence, individual trees on existing estates show a very wide range in bearing capacity and disease resistance.

Investigation in India has shown that 60 to 70 per cent. of the crop is often borne by only 20 per cent. of the total number of trees in an average acre, and the consequent need of replacing a large proportion of such trees by better bearers. Many of the Indian plantations are older than those in other parts of the Empire. On recently planted estates, such wide variations between the yields of different trees may not occur. Nevertheless,

this Indian experience points to the importance of selecting good bearing strains.

Grafting.

73. In the attack on Root Rot, grafting experiments are in progress. The Robusta and Liberica varieties are known to be more resistant to disease than is the Arabica. The production of a hybrid, resistant to Root Rot, is considered possible, but it would take a considerable time. A more practical alternative, by which Arabica coffee is grafted on to Robusta and Liberica root stocks, is being studied, with very promising results. The grafting method, besides being more expeditious, has this advantage, that the superiority of the Arabica bean, which might not survive in a hybrid, is maintained.

An additional purpose may also be served by these grafting experiments. Once a satisfactory strain has been obtained by selection and breeding, it will be possible to propagate by grafting from the highest yielding trees on an estate, with a greater degree of confidence than can be expected when plants are raised from seed. In this connection it is advisable that those in charge of this work should keep in touch with the fundamental work on root stocks carried out at East Malling, where the importance has been established of a true strain in the root itself. If the root stocks are not true to type, the results both of grafting and of manurial treatment may be variable.

**Liquoring
quality no
less
important
than yield.**

74. The production of high yielding and disease resisting strains should be of great benefit to the industry — all the more so as it appears, from the evidence before us, that in previous strains the disease resisting property has gradually declined in course of time. In all these experiments, however, and particularly in selective breeding for high yield, it must not be forgotten that the ultimate test of the coffee tree is the *liquoring quality* of the bean. We have already alluded to the opinion in the London market that in recent years there has been an appreciable decline in the desired " acidity " or " bite " in the liquor of East Indian coffee. Such an opinion cannot be ignored. In India itself the bean is judged entirely on appearance, but in the London market it is the liquor that matters. It should be of service to the industry if liquoring tests could be maintained, as is the case with tea. Further, while taste itself is purely subjective, a comparative analysis of samples of various coffees which have been reported on in London for liquoring quality might possibly reveal objective differences which subsequent experiment in manuring and selection might control. In this connection it may be noted that a research fellowship has recently been established at Yale University, for the purpose of investigating the deterioration in the flavour of coffee through age, and especially the reasons for loss of flavour after roasting.

VIII. THE UNITED KINGDOM MARKET

(A) *The London Sales*

75. The first thing the buyer considers is the appearance of the bean, particularly colour and size. It is a revelation to the uninitiated — familiar with coffee only in the ground state or, at best, after roasting — to inspect a number of samples of raw coffee from different countries and estates, and realise the great range of shade, from a bricky yellow to a grey or blue green, which the samples exhibit. The trade has a series of terms, such as "coloury," "greenish," "blueish," "greyish," etc., to denote these shades. The expert will also take a handful from the sample and examine it for scent, which, even in the green state, again reveals wide variations, some of which are indications of quality. The final, and, at any rate for the United Kingdom market, the crucial test — that for "liquor" — then follows. Portions from each sample are roasted and ground, and of each an amount equal to the weight of one penny is placed in a small bowl, and freshly boiling water poured upon it. It is given time to cool and settle, and then tasted.

How the
coffee is
valued.

76. Although a small bean does not necessarily produce an inferior liquor, the importance attached to size has this general foundation that, other things being equal, the larger size denotes the more fully developed bean, as well as, in general, the heavier bean, and as such may be expected to yield the better liquor. Again the smaller sizes will probably contain a larger proportion of imperfect or shrivelled beans, and make a less even roast. In the green state there are also a number of other virtues and imperfections, apart from mere colour, which are apparent on careful examination, though they may disappear in the roasting. In proportion as the commodity is part of a bulk rather than a special trade, or is itself in the category of bulk coffees, or likely to have to compete with bulk coffees in price, the appearance becomes more and more important in determining price. All stages in the cultivation and preparation for market of the coffee bean — soil, climate, seed variety, washing, fermenting, curing, etc. — will affect both appearance and quality. There is not one of them that will not ultimately repay the closest and most systematic attention. An example that was brought to our notice may encourage those Empire producers who are yet facing the difficulties of coffee pioneers. In the early seventies of the last century, Costa Rica coffee suffered from a tendency towards an unpleasant "fermented" flavour. The planters then paid especial attention to the fermenting and washing processes, the defect was eliminated, and Costa Rica coffee gradually became a coffee of outstanding excellence.

The London Sales.

77. The marketing of mild coffees in the London market is carried out by agents on behalf of the growers. The sales are by public auction. There is a duty of 14s. per cwt. on foreign, and 11s. 8d. per cwt. on Empire grown coffee. Until required for sale, all coffee therefore goes into Bonded Warehouses. As the coffee is listed for sale, both selling and buying brokers obtain samples. These are roasted, and the liquor prepared from them is tasted. From the appearance of the raw coffee, and particularly from the liquoring test of the roasted sample, brokers form an estimate of the value. At the sales, which usually take place twice a week, the different lots are put up for auction by brokers representing the growers' agents, and bid for by brokers representing the wholesale buyers. Foreign buyers place orders through the London buying brokers, and the competition in the auction room is thus not confined to the demand of the United Kingdom home market. The brokerage for selling is 1 per cent., and for buying, $\frac{1}{2}$ per cent. The method of sale by public auction is satisfactory, and we have received no complaint either from growers or from buyers concerning the machinery of the London market.

Distribution.

78. The selling chain is continued through secondary wholesalers to the retailer, but, as in the case of tea, the wholesale buyer may be one of the great distributing combinations who do their own blending and retailing. Among the wholesale merchants there are very few who deal in coffee only. The great majority combine the business with that in tea and other produce.

Market Intelligence.

79. It is a matter of some surprise that with regular and frequent auctions, no trade organisation yet undertakes to analyse and publish the results as a whole. There is for instance no official bulletin published by the coffee trade in London at all comparable with that issued for tea by the London Tea Brokers' Association. Growers are, however, kept informed of the progress of the market and, in varying degrees, of trade prospects, by means of periodical circulars issued to their clients by individual agents. Short summaries of the market are cabled, price lists are issued at intervals of about a fortnight, and in certain cases, quarterly reviews of the position and prospects of the market are also issued by the agents.

80. Some of these reports, and in particular the quarterly reviews, are ably and concisely written. Those who compose them are not only in close touch with the day to day situation in the London market, but are also well informed as to the general trend of the world position in the coffee trade. Moreover, as merchant bankers, the better equipped among the agents naturally spare no pains to give the best possible service to their clients. The price circulars, however, tend to deal more or less exclusively

with coffees of particular origin. Those intended for East African growers, for instance, may contain little or no description of the sales of East Indian coffee; while those which may be fuller in respect of East Indian coffee may have little or no information concerning the sales of coffee from Costa Rica. A grower, therefore, knows how his coffee has fared as compared with that of his neighbours, but not how the coffee produced in his part of the world has fared in comparison with competing coffees produced in other countries. While the industry is on a comparatively small scale, the information hitherto received by the grower has no doubt been sufficient for his purpose — at any rate, there appears to be no dissatisfaction on that score. Nevertheless, as the amount of coffee produced in the Empire increases in bulk, and as, in consequence, it becomes more and more necessary both to maintain the position already won and to gain ground in new markets, he will feel a corresponding need for fuller information concerning the prices obtained by coffees produced in other countries, as well as statistical information covering a wide field. It may easily become desirable to organize for the coffee trade a general service of market intelligence on a standard and uniform basis.

(B) *Characteristics of the London Coffee Market*

81. The United Kingdom coffee market, centred in London, is distinguished by two outstanding features. First, it is a market for high quality coffees. Secondly, it carries on an important re-export trade. The great mass of the people in the United Kingdom are tea drinkers and the consumption of coffee is small, the situation being in almost exact contrast to that in the United States. In the United States the consumption of tea per head is $\frac{3}{4}$ lb. and that of coffee 12 lbs. per annum. In the United Kingdom the corresponding figure for tea is $9\frac{1}{2}$ lbs. and for coffee $\frac{3}{4}$ lb. On the other hand, while the demand is small — the annual retained import ranging between 15 and 17 thousand tons — the majority of the consumers are those who prefer and can afford coffee of good quality. The United Kingdom is thus essentially a discriminating market, with the important consequence that other countries, particularly in Europe, expect to find the best of the mild coffees in Mincing Lane. The re-exports from London are nearly as large as the retained imports.

Chief features of the London Market.

82. Detailed figures, showing the relation between imports and re-exports, and the destination of the re-export trade, are given in the Appendix, Tables 11 and 12. In the period 1924-1930, nearly one-half of the United Kingdom coffee import was re-exported. Of the total, 54 per cent. went to Germany, 12 per cent. to Holland, and 7 per cent. to the United States. It will be observed that re-exports to the United States, though fluctuating, show a tendency

Importance of the re-export trade.

to increase. This may safely be attributed to an increasing interest taken in coffee from British East Africa.

Financial
services
rendered
by London.

83. Besides offering Empire growers an export market as valuable as that for the home trade, London plays an important part in financing the coffee trade with Europe. In the case of East African coffee, practically the whole is financed from London. The London importer or merchant banker finances the planter both in respect of fixed capital and in respect of working capital between crops. In favourable years these loans or mortgages may be reduced, but except where the planter is long established, London finances the whole operation.

The planter who is free of mortgage will nevertheless employ a firm of London agents, who will finance the shipping and undertake the sale in Mincing Lane. The planter gets an advance on the crop from the local representative of the agents, who draw on their London House at 90 days' sight. The usual commission on the sale itself is $2\frac{1}{2}$ per cent. Besides financing the planter, the London importer carries the bulk of the stock, as there is now a growing tendency for the secondary wholesaler to avoid carrying stock above his immediate requirements. Several London firms have taken a very active interest in the development of East African coffee and have put the whole of their knowledge of coffee cultivation at the disposal of their clients. There is, indeed, general recognition among the planters of the variety of services which London has rendered, and is able to render, to the industry.

84. In addition, London carries on a big business in financing shipments and sales between foreign countries. A considerable proportion of the Brazilian trade with Europe is, we were told, financed from London, even though the coffee is shipped direct from the country of origin to a port on the continent of Europe. The buyer opens a credit in London, and the exporter takes the bills of lading, which are in blank and endorsed by him, attaches them to the invoice and draws on the London bank, and is able to sell the document at once to the bank in Brazil.

London a
centre for
arbitration.

85. Of the total landings of coffee in European ports in the season 1929-30 approximately 30 per cent. went to French ports, 20 per cent. to Dutch ports, 20 per cent. to German ports, and only 5 per cent. to London. Most of the shipments to continental ports consist of South American coffee which is sold on description "to arrive." Although such coffee passes direct to the importing country, London is the centre of arbitration for the trade between South America and Europe. The prestige of London as a market for high quality coffee, and the confidence of both exporters and importers in the method and practice of London bankers and arbitrators make London acceptable to all parties concerned, even when, as in this case, the total volume of exports and imports is comparatively small.

(C) *Importance of the Re-export Trade for Empire Coffee*

86. Although the volume of the United Kingdom gross imports of coffee has not yet returned to the figure for 1913, the effects of the dislocation of the re-export trade due to the war are disappearing, and the total has risen from 28,500 tons in 1924 to 40,000 tons in 1930. In respect, however, of Empire grown imports, there has been a very great increase, from a total of 4,000 tons and a proportion of 10 per cent. in 1913, to a total of 20,000 tons and a proportion of 51 per cent. in 1930. This is due to the rapid development since the war of coffee production in East Africa, where the export has risen from 2,000 tons in 1913 to 30,000 tons in 1930.

Great increase in Empire share of gross imports.

87. Since, as was observed in paragraph 81, the total consumption in the United Kingdom is some 15 to 17 thousand tons, the capacity of that market would not suffice to absorb the present Empire-grown import, even if no foreign coffee were consumed. In fact, however, both the proportion of Empire grown coffee to the total consumed, and the total consumed itself, have remained almost stationary in recent years.

Empire imports exceed capacity of home market in United Kingdom.

88. Compared with 1913, total consumption has increased by 26 per cent. and consumption per head has increased by 2½ per cent., but in each case there has been practically no progress since 1922. The per capita figure, indeed, still remains less than it was in 1880, and 25 per cent. less than it was in 1840.

Consumption per capita now stationary.

It may be of interest to note, in passing, that even in the United States the increased consumption of coffee has been, in recent years, due more to increase in population than to any increase in consumption per head. The average net import of coffee into the United States for 1861-1870 was 74,000 tons. In the period 1921-1930, the average was 625,000 tons — an eightfold increase as against a fourfold increase in population. But since 1900, the consumption per head has only advanced from 11.65 lbs. to 12.15 lbs., i.e., it has merely kept pace with the population, as in the United Kingdom.

89. Consumption being stationary, it follows that it is through the re-export trade that the increased United Kingdom import — and particularly the increased import of Empire grown coffee — is being absorbed. In the Appendix, Tables 13 and 20, are shown figures for the United Kingdom imports and re-exports, and for home consumption, in recent years, together with the proportion of Empire grown coffee in the totals. In the two tables in this paragraph, the figures are given for the two terminal years, 1924 and 1930. Comparison of Tables (a) and (b) shows that while consumption, and the Empire-grown share in it, have barely advanced, re-exports have increased by 55 per cent., and that while the Empire share in gross imports has increased from 37 to 51 per cent., the Empire share in re-exports has increased from 22 per

Progress of Empire coffee in the re-export trade.

cent. to 45 per cent. — or more than doubled in the period, the actual figure for Empire re-exports in 1930 being more than three times the figure in 1924.

(a) *Consumption of Coffee in the United Kingdom, in thousand cwts.*

	Empire grown	Foreign grown	Total	Empire percentage
1924	144·3	167·1	311·4	46·3
1930	148·9	166·5	315·4	47·2

(b) *United Kingdom Imports and Exports of raw coffee, in thousand cwts.*

	Gross Imports			Re-exports		
	Total	Empire grown	Empire percentage	Total	Empire grown	Empire percentage
1924	571·5	214·1	37·5	283·7	61·6	21·7
1930	814·7	418·0	51·3	441·0	198·3	45·0

(D) *Obstacles to Increased Consumption in United Kingdom*

90. From the evidence before us there appears to be a general opinion among competent judges that the chances of any considerable increase of coffee consumption in the United Kingdom are slight. Some of the obstacles may now be considered.

Price factor.

91. The first is the factor of price. Not only is tea now thoroughly established as the predominant beverage, but it is very much cheaper than coffee. While the retail prices per pound for coffee are much the same as those for the medium qualities of tea which form the great bulk of the sales, the amount of coffee required to make a breakfast cup of liquid is between four and five times as much as it is in the case of tea. Moreover, if coffee is to be consumed as a beverage — e.g., at breakfast, as distinguished from being sipped black after dinner, most consumers require with it the admixture of generous quantities of milk, and the better and stronger the coffee is prepared the more milk it requires. The price of milk in the United Kingdom now stands at 64 per cent. above pre-war levels, and there seems little likelihood of a substantial reduction. It is therefore considered that the comparative cost of coffee as a beverage precludes the possibility of its making such appreciable progress among the great mass of the population as alone would make any revolutionary increase in the amount sold. Other nations, it is true, with a standard of living no higher than that of the United Kingdom,

are large consumers of coffee and correspondingly large consumers of milk. It is significant that Sweden and Denmark, which have the highest consumption of coffee per head of population (16 and 15 lbs. respectively) also have a milk consumption of between 68 and 70 gallons per head, compared with the United Kingdom figure of 22 gallons.

92. It must however not be forgotten that the basis of blends in the countries which are large coffee consumers is Brazilian coffee, with an average price between 30 and 50 per cent. below that of the highest priced mild coffee in the United Kingdom market (see Appendix, Table 22), while still lower grades of Brazilian would be used in the cheaper blends. In the United Kingdom, taste has been formed, for generations, on the superior mild coffees, and it is unlikely that the Brazilian type, with its markedly different flavour, would be acceptable. Should such a change in taste be brought about, it would require a very considerable increase in general consumption to compensate for the loss which Empire producers might at first sustain. Moreover it is not certain how far the position of London as the European centre for mild coffees might not be prejudiced.

Bulk coffees
not suited
to United
Kingdom
market.

93. Consumption might be stimulated by a narrowing of the margin between wholesale and retail prices. From the figures in the Appendix, Table 10, it will be seen that the average price in Mincing Lane for the highest priced coffees has rarely reached 1s. 6d. a lb. (including maximum duty of 1½d. a lb.) and the general level is much lower. Coffee of this quality would not retail at less than 3s. a lb., and very little coffee, unmixed with chicory, retails in the United Kingdom at less than 2s. The cost of roasting and grinding may be put at 2½d. a lb. — the difference in price between ground and raw coffee in the shops. Although the data before us do not suffice for a detailed study of the retail price margin, it is clear that it is wide — wider than that in the case of tea, which we found in our Report to be approximately 8½d. a lb. on 1930 prices.

Retail price
margin.

The wider margin is perhaps partly due to the fact that the total turnover in coffee is much smaller than in the case of tea. The retailer would naturally consider how far a reduction in price would be compensated by increased sales. Nevertheless there is support in the trade itself for the view that some reduction in price would materially assist an effort to stimulate demand, providing that the two policies were co-ordinated and quality maintained.

94. One consequence of the great predominance which tea has acquired in the United Kingdom is that there has been some loss of tradition in the art of preparing coffee for the table. Yet in the early days,

Loss of
tradition in
preparing
coffee for the
table.

Coffee, which makes the politician wise,
And see through all things with his half-shut eyes,

was the more important beverage of the two. The part played by the coffee houses of London in the first quarter of the eighteenth century is a classic chapter in the social, political and literary history of England. Of those famous originals only a few survive, in much altered form, in club-land; one has suffered a sea-change into the most celebrated of British Insurance Corporations; while tucked away in a corner of Castle Court, Cornhill, with modern buildings towering round and above it in menacing disproportion, one of the oldest of them all now thrives as a favourite city chop-house.

Inadequate quantities of coffee used.

95. There is to-day this paradox, that while it is to the London market that the merchant would turn for a supply of the finest coffee in the raw, this reputation is not maintained when it is a question of the beverage — largely owing to disregard of the simple essentials of a good cup of coffee. The first of these is that a sufficient quantity of coffee should be used. The shortcomings of coffee as served in the United Kingdom have been much exaggerated. There has been considerable improvement since the extension during the last 30 or 40 years of "cafés" up and down the country where some effort has been made to serve coffee properly prepared. It is, however, unfortunately true that both in restaurants and private houses the coffee lover is always a little uncertain as to the quality of the coffee that may be served. It is also a common fault, even in the big popular restaurants in London where excellent coffee is used and much care taken in its preparation, that "white" coffee is served with a standard quantity of milk, determined by the proprietors, instead of being adapted to the taste of the consumer, as on the Continent.

96. It is unfortunately true that in private houses the use of an inadequate amount of coffee per cup is still not uncommon not only among those to whom expense is a serious factor, but also among those who could afford to ignore extreme economy. There are many consumers who will buy the most expensive coffee from the retailer but employ about one-half of the right amount of ground coffee per cup.

Failure to realize importance of using freshly ground coffee.

97. Equally important is the freshness of the coffee used, and ignorance of this condition is more widespread than that concerning the proper quantity required. Once coffee is roasted, as it must be before it is used, it is a cooked article, and its quality rapidly deteriorates. It is thus essential that it should be consumed as soon as possible after being roasted and ground. Before being ground, roasted coffee may maintain its freshness for about a week, but once ground, deterioration in flavour is a matter of hours. Stale coffee may be likened to the day before yesterday's newspaper. Though not quite without interest, it has lost its savour. Yet many consumers will lay in a stock of tins of ground coffee, as they

lay in stocks of jam, instead of purchasing at frequent intervals according to their requirements, as they do in the case of bread, cake, biscuits or cheese.

98. The use of the hermetically sealed tin is growing in favour among the bigger distributors. This is an advance on the ordinary type of tin still frequently used, but it is said that even in the hermetically sealed tin some deterioration of flavour takes place, and in any case distribution even in hermetically sealed tins is of itself of little avail unless the customer understands that the contents should be consumed as rapidly as possible after the opening of the tin. It follows that there is an urgent need to educate the consumer to buy coffee frequently and in small quantities for immediate consumption. It is generally agreed that freshly ground coffee, if consumed quickly before its flavour has evaporated, is superior to coffee in the hermetically sealed tin. Once the superiority of really fresh ground coffee is understood, there should be no more difficulty in obtaining frequent supplies of small quantities, freshly ground by the grocer, than there is in obtaining similar supplies of bread from the baker and milk from the dairy. With regard to the sealed tin, it may be added that certain of the large distributors put secret marks on their tins which enable them to check the retailer's turnover, and adapt the supply accordingly. In the United States the process has been carried a step further, and there is an increasing tendency among large distributors to mark the tin with the date on which it was sealed, thus at once educating the consumer and giving him a guarantee.

99. While it is agreed that the ideal is for the coffee to be ground at the counter by the retail grocer, there is less agreement as to whether the roasting is best done by him or by the wholesaler. There is no doubt that by roasting his own coffee the retail grocer, if he does it well, finds it a great stimulus to sales. We were informed, for instance, that one grocer, who had previously been satisfied with a turnover of 80 lbs. a week for his seven shops, and who was induced to arrange for an eleven-day demonstration of coffee roasting under competent supervision, sold 1,150 lbs. during the demonstration and later increased his sales to 8 cwts. a week. On the other hand, coffee roasting, though not the mystery which it is sometimes made out to be, does require a considerable degree of skill and needs to be very carefully adjusted, not only to the water supply of the district, but also to the type of coffee employed. Where it is possible for the grocer to give the time and the trouble necessary to success, there is every ground for believing that he will do well to undertake his own roasting, but except where this is possible the roasting is perhaps better done by the wholesaler, who roasts in big

Opportunities for retail grocers.

machines of 1 to 2 cwts. capacity and can employ trained men for the work.

100. It is said that only about 10 per cent. of the retail grocers in the United Kingdom are at present making a special feature of their trade in coffee, yet even if the retailer does not attempt his own roasting, there are few commodities that offer a more promising field for enterprise. While the low consumption of coffee in what is essentially a tea drinking country is a reason for apathy on the part of the retailer, it is at the same time his opportunity. It is true that as far as the mass of the people is concerned, the price factor is an obstacle, but among many sections of the public there is scope for expanding the sale of coffee as an additional drink, without detriment to the sales of tea. If the retailer obtains from the wholesaler frequent supplies of freshly roasted coffee, strictly proportionate to his weekly turnover, and induces his customers to obtain from him frequent supplies of small quantities strictly proportionate to their daily consumption, and freshly ground by him at the counter, the superior freshness of the coffee so supplied, if properly prepared, will not only secure a larger share of the trade, but should materially widen the market through the satisfaction which really fresh coffee, and only fresh coffee, can afford.

Chicory.

101. The use of chicory as an adulterant of coffee on the Continent of Europe is well-known, but it may come as a surprise to many that in the United Kingdom one pound of chicory is consumed for every five pounds of coffee (see Appendix, Table 9). The plant is native to England, but the commercial supply is imported, chiefly from Belgium. The root is roasted and powdered, and when mixed with ground coffee gives body (thickness), colour and "bite" to the beverage. It can be purchased separately at about 7½d. a pound retail, or mixed with coffee at prices round about 1s. 8d. and 2s. 1d. a pound. As some of these mixtures contain up to 40 per cent. of chicory, it is evident that in these cases they are a bad bargain for the consumer.

102. Of the total chicory consumed, it is estimated that 25 per cent. is sold in mixtures of ground coffee and chicory, and 75 per cent. in the form of liquid extract, in which the proportion of chicory is very high. While the sale of the ground mixtures depends on the price factor, the sale of the extracts may be attributed chiefly to the desire to avoid trouble in the kitchen. Nevertheless, the notion that the use of liquid extract is any real saving of time is a popular error which it should not be difficult to dispel. Coffee can be as quickly and easily prepared as tea, no complicated apparatus is necessary, the time required for the grounds to settle is no more than that required for tea to brew, and the disposal of them is a simpler matter than that of used tea leaves.

103. The consumer in the United Kingdom is at present protected by law in so far that if any substance is mixed with the coffee the fact must be declared on the container or otherwise brought to his notice. He is, however, completely in the dark as to the proportions of chicory the mixtures or extracts contain. In the "extracts" or "essences" especially, the proportion may be very high. Moreover, in some cases these mixtures and extracts are *advertised* simply as coffee, with no reference to the fact that they contain chicory.

104. The regulations in other parts of the Empire are more explicit. In Canada, for instance, unless the article consists purely of coffee, it must be sold as a mixture or compound, the names of the ingredients must be stated on the label, and if the mixture is sold as a "coffee mixture" the proportion of coffee must be at least 51 per cent. In the Union of South Africa, the latest regulations are similar, except that the proportions as well as the names of the ingredients of a mixture of coffee and other substances must be stated on the label, and the minimum proportion of coffee must be 75 per cent. in the case of mixtures of ground coffee and chicory, and 50 per cent. in the case of liquid extracts. A special Committee has recently been appointed by H.M. Government in the United Kingdom to enquire into the general question of food standards and the practice there obtaining. This may afford an opportunity of examining the case of coffee mixtures and extracts.

105. Over the last seven years, the ratio of the consumption of chicory to that of coffee has shown no tendency to increase—indeed, when compared with that prevailing before the war, it shows a decline. Although the change is slow, this reduction indicates a gradually increasing tendency to prefer the genuine article. This tendency is checked by the recent practice of large distributors, chain stores and multiple shop organizations, to compete in the trade in "extracts" of chicory and coffee, thereby stimulating demand. It is possible that in some degree the purchasers of coffee and chicory extracts are at present distinct from those who purchase coffee, but they are a potential market for the genuine article, and it is arguable whether coffee distributors would not be better advised to win them for coffee rather than abandon them to chicory. The prize is a possible increase of coffee consumption up to 20 per cent. It should at least be worth an effort. If the retailers passed on to the consumer a larger proportion of the fall in the wholesale price of coffee, it is possible that a good deal of the chicory and coffee mixtures might be replaced by blends of pure coffee, and if the coffee trade as a whole, including the retail grocers, combined to advertise and demonstrate the simple facts of coffee preparation, many illusions might be dispelled to the benefit of trader and consumer alike.

aroma is retained, that no apparatus is needed, and that the simple utensils employed are easily cleaned. Freshly ground coffee, a warmed earthenware jug, a wooden spoon and freshly boiling water are all that is required. The ground coffee is put into the jug, the boiling water is poured on, the liquid is well stirred, and the froth removed with the spoon. The coffee is then left to stand in a warm place for 5 or 6 minutes (during which the grounds will settle) and is ready to serve.

A pinch of salt improves the flavour and a few drops of cold water assist the settling of the grounds. If desired, the liquid can be decanted into another vessel, which should be warmed. Strainers can be used, but are not necessary, and many connoisseurs eschew them.

110. While there is a point in stressing the claims of simple methods of preparation, such as that we have just described, there should be no advocacy of a false economy in the quantities used. Coffee can never compete with tea in cheapness, yet a delicious breakfast cup of coffee can be made at a price, for the coffee, of less than a penny. To reduce the cost by using an insufficient quantity of coffee will ruin the flavour, and the beverage will still be dearer than tea, and indeed, as so prepared, dear at any price.

Stinting the quantity a false economy.

111. For making breakfast coffee 2 ounces of ground coffee should be used for each pint of water. This would be consumed with $\frac{1}{3}$ to $\frac{1}{2}$ its own quantity of warm milk added, and would thus produce 4 to 5 breakfast cups of coffee and milk. The proportion of coffee can be slightly reduced in preparing large quantities, but it is a common mistake to use an insufficient amount of coffee in preparing coffee for breakfast. To an over-weak and thin decoction a little milk is added, and the result is a liquid such as provoked the mythical traveller to exclaim "if this is tea bring me coffee; if this is coffee bring me tea."

112. We have already drawn attention to the need of bringing home to the consumer the importance of using freshly ground coffee. We stress the point once more, since we feel that it should be brought right to the front in any campaign to stimulate demand. Consumers in the United Kingdom have already been exhorted to "Eat More Fish" and to "Eat More Fruit". The effectiveness of a similar appeal to "Drink More Coffee" is doubtful, but we believe that an appeal to "Use Fresh Coffee" as one of the conditions of the proper preparation of the beverage, would indirectly stimulate demand, through the new satisfaction which the consumer would experience.

Freshly ground coffee essential.

113. Good wine needs no bush, and the best advertisement for coffee is the beverage itself, well prepared and served hot. We would emphasize the value of demonstration, both because it is a comparatively cheap as well as a telling method of advertisement, and also because it is one in which the whole trade can co-operate

Value of demonstrations.

and each member benefit in proportion to the energy with which he takes part. Enterprising retailers have already proved the value of "coffee weeks" in which displays are accompanied by demonstrations of coffee making. At all exhibitions, such demonstrations, carefully organised, should greatly strengthen the effectiveness of the exhibit. The Empire Marketing Board has already done much valuable work on behalf of the newer coffee areas in the Empire. Demonstrations, together with a distribution of appropriate leaflets on Empire coffee and the methods of preparing it for the table, may offer a further field of useful service.

IX. COMPETITIVE POSITION IN UNITED KINGDOM MARKET.

Competitive position in United Kingdom market.

114. In the United Kingdom market the reputation of Empire grown coffee has been built up in competition with the best grades of coffee from foreign countries, and it is in the face of such competition that the place it now holds, as constituting one half of the home and re-export trade in that market, is to be maintained and strengthened. It is therefore politic for Empire growers, especially those in the newer coffee areas of the Empire, to take as standard for that market the strength of their principal competitor, Costa Rica, which constitutes between 35 and 40 per cent. of the United Kingdom market (see Appendix, Table 19). Costa Rica now produces coffee of high quality and, with the exception of the Blue Mountain Jamaica—which is a luxury article—obtains the highest average price in the London sales. The strength of its position, however, is also due in no small measure to the fact that as a well established area Costa Rica is able to maintain a regular supply of coffee, uniform in quality and very carefully graded, as the basis of standard blends which need to be kept uniform throughout the year. It is at present one of the drawbacks of East African coffee that both the amount and the quality of the crop are uncertain. All coffee crops vary from year to year, and as the acreage under coffee in East Africa increases there should be less risk of a shortage of grades suitable for United Kingdom requirements. The question of evenness and uniformity of grading is more difficult, and we have already referred to it in paragraphs 44 to 49. Its importance cannot be too strongly emphasized. We have had evidence that certain large distributors in the United Kingdom are prepared to put on the market an all Empire blend with East African coffee as the basis as soon as they can be sure of a sufficiently regular supply of coffee of the required quality and in the required quantity as would make possible the maintenance, from year to year, of a uniform standard blend.

Empire blends.

115. The problem of a purely Empire blend is a difficult one. On a relatively small scale such blends are already possible, and meet the requirements of special consumers, such as clubs and institutions, and also the requirements of retailers of high quality

coffee serving a special clientèle, but the employment of such blends in a nation-wide distribution is dependent on the steady supply of considerable quantities, uniform in quality from year to year. While the "stand out" grades thus find a market in all-Empire blends of limited sale, or as coffee to be consumed unblended or "straight", the greater part of the Empire coffee retailed in the United Kingdom is at present sold blended with other fine coffees, such as Costa Rica.

116. Although the bulk of the coffee retailed in the United Kingdom, including that from Costa Rica, is sold blended and without reference to the country of origin, there are some important exceptions to the general rule. Blue Mountain Jamaica, a luxury article, is usually sold by name and unblended. There is also an old established demand especially among certain consumers in London, for Mysore coffee, or a blend of Mysore and Mocha. This again is largely sold by name, whether roasted or ground. It is, however, mainly the best qualities or "home-trade marks" of Indian coffee that are sent to the United Kingdom. Part is again re-exported, and the Indian coffee retained in the United Kingdom amounts to only 10 per cent. of the total Indian export. Indian coffee in the United Kingdom may thus be regarded almost as a special trade.

Empire
coffees for use
unblended.

117. In addition, the finest grades of East African coffee now have a similar sale. While the bulk is blended with other fine coffees, there is a proportion of such outstanding quality that it is winning its way in the public favour as a coffee suitable for drinking unblended.* In Mincing Lane, East African coffees are sold, like other coffees, under estate "marks" and district names, such as Nairobi, Arusha, Moschi, Kilimanjaro, etc., but when they are retailed by name it has come to be the custom of the trade to sell them under the general name of "Kenya" coffee, whether grown in Kenya Colony or in Tanganyika Territory. (It is held that the use of the term "Kenya" in retail sale is not open to objection, so long as it is confined — as we understand is at present the case — to the Arabica coffee grown in these two areas, in which some of the coffee districts are separated by political rather than any natural boundaries.) There is no doubt that the highest grade "Kenya" is a very fine coffee indeed, and while it has benefited by the general movement in the United Kingdom in favour of Empire produce, fostered by the Empire Marketing Board, it is also true that once it is known it gains ground on its own merits. The difficulty at the moment is that there is not enough of the top grade of East African coffee to go round. It is estimated that about 10 per cent. of Kenya and Tanganyika coffee is in this grade, and on that basis would represent approximately 8 per cent. of the total of all coffee consumed in the United Kingdom, assuming that none of it was exported.

* i.e. without being blended with coffees of other origin.

118. The growing popularity of the finest grades of "Kenya" as a coffee for drinking unblended is, in fact creating a special problem. Some distributors and retailers are tempted to exploit that popularity by retailing for this purpose cheaper qualities of "Kenya" coffee which, while suitable for use in blends, are not so suitable for drinking unblended. The purchaser, accustomed to the flavour of the mixed blend, is dissatisfied and thenceforth prejudiced against unblended "Kenya" coffee as such. In a word, the good name of the finest grades of "Kenya" coffee are not enhanced, but damaged by the sale as "self-drinking" coffees of the cheaper grades which are not suitable for drinking unblended. It is not the least of the advantages that might follow from the establishment in East Africa of standard grades (based on quality as well as size) that the reputation of the finest grades would be to some extent protected, the highest grade being given a brand mark which might distinguish it in the retail as well as the wholesale trade. The retailer of the finest grades could protect himself by selling them under their grade mark, and the purchaser would learn to recognise the mark as that of a quality suitable for drinking unblended.

X. MARKETS FOR COFFEE IN THE DOMINIONS OVERSEAS

119. Figures for the import of coffee into four of the Dominions — Canada, Australia, New Zealand and the Union of South Africa — are given in tables 23 to 26 of the Appendix. In two of them, Canada and South Africa, the import is considerable, amounting in each case to an average of approximately 250,000 cwts. a year. As only 35 per cent. of the coffee imported into Canada and less than 5 per cent. of that imported into the Union is of Empire origin, both these Dominions should offer opportunities to Empire growers for extended markets.

Canada.

120. A considerable proportion of the Canadian import has always consisted of "mild" coffees, but the noticeable feature in the Canadian trade returns is the increase in the imports of Empire grown coffee subsequent to April, 1926, when Empire grown coffees (imported direct or from bond in the United Kingdom) were placed on the free list, whilst coffees from other sources remained subject to duty. The trade in coffee from the British West Indies is one of those which have profited by the efforts made to develop general trade between these colonies and Canada, and about two-thirds of the Empire grown coffee imported into Canada now comes from the West Indies. The preference has also encouraged the import of coffee from British East Africa, and is particularly helpful since in the Canadian market Empire coffee has to meet the competition not only of Brazilian coffee but also of the mild coffees of Central America, such as Colombia, Costa Rica and Guatemala.

South Africa.

121. In Australia, South Africa, and New Zealand no preference on raw coffee is given. Popular taste in the Union seems

similar in some respects to that in the coffee drinking countries of Europe. The demand is for the "bulk" coffees, with which is used a certain proportion of chicory. At present 90 per cent. of the imports of raw coffee come from Brazil. In spite of the formidable competitive position of Brazilian coffee, we believe that the Union should offer a promising market for certain types of East African coffee. The import of Empire grown coffee is already showing a slight tendency to increase. The "mild" coffees imported into the Union, other than those from Empire countries, come almost entirely from the Netherlands East Indies, which are the chief exporters of Robusta coffee. There are areas in East Africa — particularly in Tanganyika — which are especially suited to the cultivation of this variety. As we have pointed out, Robusta coffee is a variety which in world markets has to compete in price with the Brazilian. It is not impossible that with the development of trade connections between East Africa and the Union, Kenya and Tanganyika may find in the South of the Continent an expanding market for Robusta coffee.

122. Possibly a sale for the same type of coffee might be found in Australia, but the total imports of coffee into the Commonwealth are small — about 30,000 cwts. a year — and competition from the Netherlands East Indies, which are nearer the market, would be severe. Australia, like New Zealand, is pre-eminently a tea-drinking country. Of the coffee imported into Australia over one-half comes from the Netherlands East Indies, which are also the principal source of foreign coffee imported into New Zealand. In New Zealand the consumption of coffee has increased by 40 per cent. in the ten years 1920-1929, but the total import in the last of those years was only 3,800 cwt. Nearly the whole (90 per cent.) of the increase has been secured by foreign coffees. Even so, the market in New Zealand is for "mild" coffees, and although no tariff preference is given (except in the case of roasted coffee) over 40 per cent. of the total import is Empire grown. While, therefore, Empire producers retain a large share of the market, their position is no longer unchallenged.

Australia and
New Zealand

XI. CONCLUSION

123. The coffee industry has not escaped the effect of the world-wide depression in trade that prevails at the present time, and is further embarrassed by the results of over-production in Brazil which are likely to influence the situation for some time to come. The general level of quality of Empire grown coffees has, however, served in some measure to protect them from the severity of the slump, and is the best guarantee of their future.

124. There is this broad distinction between the older and the newer coffee producing areas of the Empire that the older areas, while showing no signs of expanding production, are relatively more sure of their markets. Particularly is this true of the Blue

Mountain Jamaica coffee, which is at once the finest in the world and in limited supply, and of Indian coffee, which, as is the case with Indian tea, is finding a steadily increasing market in India itself. On the other hand, in the new areas in East Africa, the great expansion of production which has taken place since the war is not yet over. The coffee there produced has rapidly won its way on account of its quality. Larger quantities may be produced in the future.

125. Such expansion as can be expected in the consumption of coffee in the United Kingdom would not suffice to absorb the present East African output, even if no other coffees were consumed. As production develops, Empire growers will therefore look more and more to the re-export trade of the United Kingdom, and to the world market, as an outlet for their produce. Both the demand and the supply of "mild" coffees, as distinct from the bulk coffees of Brazil, are limited, but the demand for "mild" coffees has been gradually increasing in recent years, and the share which East African growers will obtain in satisfying that demand will depend in the future, even more than in the past, on the standard of quality attained.

126. Production in East Africa has developed rapidly in the last decade. In Kenya, coffee now represents in value over 40 per cent. of the total domestic exports of the Colony. In this period of expansion, a generous—perhaps an over-generous—proportion of the profits has been devoted to development. The signs now point to the wisdom of a more cautious policy, devoted to the consolidation of resources, the building up of capital reserves, and a whole-hearted concentration on the complex factors that determine quality. We have reason to believe, on good authority, that in the view of the London market this is the true road to the future prosperity of the industry. In the long run the cultivation of the finer varieties and the production of the higher grades does not involve much more expense than is involved in the production of others which are more severely affected by market fluctuations. There is always room at the top. High grade coffees will find a home when others are a drug in the market. By the energy of individual effort the best East African coffee has already reached a high standard, although the industry is yet in its early stages. As the benefits of research and co-operative effort accrue, a steadily increasing proportion of East African coffee should come within those grades which have least to fear from foreign competition or market depression.

127. In the United Kingdom market the re-export figure exceeds that for home consumption, which, on an average, is not quite half the total volume. The position of London as an international market for high grade coffees thus affords Empire growers the benefit of auction prices determined by a demand much wider than that for the trade in the United Kingdom itself. Of the

coffee there consumed, nearly one half is Empire grown. The foreign coffees are mostly of a high grade which form a basis for blending with these Empire grown varieties. A few blends consisting entirely of Empire coffees (mainly of specially selected grades) are available, and should increase when further improvement in the methods of preparation for market facilitate a supply more even in quality from year to year. In addition, some of the highest grades of Empire coffee are sold for drinking unblended.

128. Consumption of coffee in the United Kingdom increased after the war, and is now 26 per cent. higher than in 1913, but has remained stationary since 1925. We have stated our reasons for the belief that a large increase, such as could only be the result of a wide popular demand, is unlikely, but that there is some prospect of a gradual increase of consumption among a considerable section of the public, providing that the effort to stimulate demand is conducted on the right lines, and the general quality of coffee retailed is maintained. The end in view will, in our opinion, best be attained not so much by an elaborate advertising campaign as by a sustained effort on the part of all sections of the coffee trade in the United Kingdom, having as its sole aim the removal of popular misconceptions concerning methods of preparing coffee for the table. An instructional campaign of this kind, laying special stress on the importance of using freshly ground coffee in suitable proportions, and on the efficacy of quite simple methods of preparation when properly employed, should go far towards removing one of the chief obstacles which at present hinder the appreciation of coffee in the United Kingdom.

S. J. CHAPMAN (Chairman)	} United Kingdom
THOMAS ALLEN	
HARRISON WATSON	Canada
F. L. McDOUGALL	Australia
J. H. DIMOND	South Africa
T. M. WILFORD	} New Zealand
R. S. FORSYTH	
J. W. DULANTY	Irish Free State
WILLIAM C. JOB	Newfoundland
A. C. CHATTERJEE	} India
CAMPBELL RHODES	
J. W. DOWNIE	Southern Rhodesia
G. GRINDLE	} Colonies and Protectorates
J. H. BATTY	
D. T. CHADWICK (Secretary)	
LIONEL BRADGATE (Assistant)	

30 June, 1931

APPENDIX

TABLE 1

World Production, Consumption and Visible Supply of Coffee, 1901-1930, in million bags, based on figures issued by the New York Coffee and Sugar Exchange.

—	Brazilians	Milds	Total Production	World Consumption		World visible supply on July 1
1900-01	11.2	3.9	15.1	14.3	1901	6.9
1901-02	15.9	3.8	19.7	15.5	1902	11.3
1902-03	12.8	3.8	16.6	15.9	1903	11.9
1903-04	0.9	5.0	15.9	16.1	1904	12.4
1904-05	10.5	3.9	14.4	16.1	1905	11.3
1905-06	10.7	4.1	14.8	16.7	1906	9.6
1906-07	20.1	3.7	23.8	17.5	1907	16.4
1907-08	10.8	4.0	14.8	17.5	1908	14.1
1908-09	12.8	4.1	16.9	18.6	1909	12.8
1909-10	15.2	3.9	19.1	18.1	1910	13.7
1910-11	10.8	3.7	14.5	17.5	1911	11.0
1911-12	13.1	4.3	17.4	17.5	1912	10.0
1912-13	12.1	4.2	16.3	16.8	1913	10.3
1913-14	14.5	5.1	19.6	18.5	1914	11.3
1914-15	13.5	4.4	17.9	21.4	1915	7.5
1915-16	15.9	4.8	20.7	19.8	1916	7.3
1916-17	12.7	3.9	16.6	14.2	1917	—
1917-18	15.8	3.0	18.8	—	1918	—
1918-19	9.7	4.5	14.2	—	1919	7.2
1919-20	7.5	7.6	15.1	18.5	1920	6.9
1920-21	14.5	5.8	20.3	18.4	1921	8.6
1921-22	12.9	6.9	19.8	17.7	1922	8.6
1922-23	10.2	5.7	15.9	19.1	1923	5.3
1923-24	14.8	6.9	21.7	22.0	1924	5.0
1924-25	13.2	6.7	19.9	20.5	1925	5.0
1925-26	14.0	7.0	21.0	21.7	1926	7.3(b)
1926-27	14.7	7.1	21.8	21.3	1927	7.7(b)
1927-28	25.9	8.0	33.9	23.5	1928	18.2(b)
1928-29	9.5(a)	8.6	18.1	22.2	1929	14.3(b)
1929-30	29.4(a)	8.2	37.6	23.5	1930	28.5(b)

(a) Comprises receipts, plus increase, if any, in "interior stocks" during crop year.

(b) Includes "Interior stocks" at Brazilian ports.

Note: "Consumption" in this table represents the figure for deliveries in importing countries; Brazilian production represents receipts at ports of shipment; "Milds" production represents arrivals at ports of consuming countries. As this last figure is lower than that for the export figure for exporting countries the export figure has been taken in the body of the Report as affording a better indication of the production of "mild" coffees.

TABLE 2

Exports of Coffee from Empire Countries, in Thousands of Cwts., Calendar years.

	Kenya	Uganda	Tanganyika	Nyasa- land	E. Africa Total	India	Jamaica	Trinidad	British Guiana	Total
1913	5.0	12.2	21.2*	1.7	18.9	197.1	58.2	†	.8	290.0‡
1924	158.4	41.1	105.2	.4	305.1	209.2	51.9	4.6	4.6	575.4
1925	147.3	29.9	120.2	.2	297.6	258.9	104.0	5.3	6.0	681.8
1926	140.9	33.2	130.8	.5	305.4	109.3	66.4	4.4	6.9	492.4
1927	209.8	43.5	131.9	.3	385.5	279.7	81.7	1.5	3.8	752.2
1928	211.6	40.3	208.6	.4	460.9	255.0	78.9	2.4	8.2	805.4
1929	133.1	41.2	177.1	.9	352.3	103.3	59.0	7.3	8.1	530.0
1930	310.1	48.9	230.9	1.0	590.9	311.5	61.4	4.4	3.5	971.7

* Not included in totals for this year.

† 20 cwts.

‡ Excluding Tanganyika, but including Federated Malay States 14,580 cwts., Sierra Leone 153 cwts., Nigeria 88 cwts., Ceylon 187 cwts., and Trinidad 20 cwts.

TABLE 3

Destination of Indian Coffee Exports, in thousand cwts.

Principal countries of destination	1924	1925	1926	1927	1928	1929	1930
United Kingdom	43·0	108·4	30·1	86·7	59·2	27·4	98·9
France	71·5	46·9	18·7	63·0	66·2	22·0	110·0
Netherlands	22·4	15·6	8·7	26·5	25·2	2·4	15·9
Germany	13·7	27·0	7·1	31·5	31·7	10·4	21·2
Mesopotamia	9·4	12·0	10·1	10·7	11·1	10·7	7·4
Total to all countries	209·2	258·9	109·3	279·7	255·0	103·3	311·5
Percentage to U.K.	20·5	41·8	27·5	31·0	23·2	26·5	31·0

TABLE 4

Destination of Coffee Exports of Kenya Colony and Uganda, in thousand cwts.

Principal countries of destination	1926	1927	1928	1929
United Kingdom	135·5	207·2	194·1	125·2
Union of S. Africa	8·2	9·6	7·7	10·6
Australia	1·9	1·2	1·1	2·5
Egypt	5·0	6·0	5·8	1·8
France	8·7	4·2	12·6	4·2
Italy and Italian Colonies in Africa	7·6	12·3	14·2	7·7
U.S.A.	—	·3	·9	·7
Total from Kenya and Uganda to all countries.	174·1	253·3	251·9	174·3
Percentage to U.K.	78·3	81·8	77·0	71·8

TABLE 5

Destination of Tanganyika Coffee Exports (including coffee transit through Kenya Colony), in thousand cwts.

Principal countries of destination	1926	1927	1928	1929
United Kingdom	36·1	56·3	68·8	45·6
Egypt	21·3	18·9	22·9	34·7
France	15·5	16·9	56·8	11·7
Germany	2·5	3·8	2·9	2·0
Holland	4·6	2·6	10·0	—
Italy and Italian Colonies in Africa	8·9	11·5	14·0	15·3
U.S.A.	—	—	11·7	22·6
Total to all countries	130·8	131·9	208·6	177·1
Percentage to U.K.	27·6	42·7	33·0	25·7

TABLE 6

Destination of British Guiana Coffee Exports, in thousand cwts.

—	1913	1924	1929
United Kingdom	7·75	·364	—
Netherlands	—	4·048	5·938
Other Countries	·23	·169	2·160*
Total	7·98	4·581	8·098

* 1,389 cwts. to Norway.

TABLE 7

Destination of Exports of Raw Coffee from Brazil, in thousand bags of 132 lbs.

Figures of the Brazilian Department of Commercial Statistics

	Bags (000)		Percentage of Total	
	1927	1928	1927	1928
United States	7,946	7,274	52.6	52.4
France	1,829	1,546	12.1	11.1
Germany	955	1,028	6.3	7.4
Netherlands	953	866	6.3	6.2
Italy	970	894	6.4	6.4
Sweden	447	429	3.0	3.1
Argentina	401	460	2.7	3.3
Belgium	396	321	2.6	2.3
Denmark	169	156	1.1	1.1
Algeria	155	151	1.0	1.1
Spain	110	98	0.7	0.7
Union of S. Africa	203	166	1.3	1.2
United Kingdom	9	9	0.4	0.7
Total, including other countries	15,115	13,881	—	—

TABLE 8

Exports of Coffee from the Netherlands East Indies, in thousand cwts.

	Arabica	Liberica	Robusta	" Other "	Total
1913	147.9	52.2	177.7	134.2	512.0
1923	20.4	14.3	614.4	110.8	759.9
1924	41.5	17.0	1,208.1	170.0	1,436.4
1927	177.2	3.7	1,508.1	11.1	1,700.1
1928	164.7	9.4	2,109.0	11.0	2,294.1

TABLE 9

*Destination of Coffee Exports of Netherlands East Indies,
in thousand cwts.*

	1913	1924	1928
Australia and New Zealand	6	15	15
Denmark	18	48	106
Egypt	21	9	5
France	81	326	659
Netherlands	186	404	417
Straits Settlements	51	189	142
U.S.A.	51	191	495
Total, including other countries	512	1,436	2,294
Total from Java	384	773	979
" " Outer Islands	128	663	1,315

TABLE 10

*Gross Imports of Coffee (including roasted and ground) into the
United Kingdom, in thousand cwts.*

	1924	1925	1926	1927	1928	1929	1930
Central America	226.6	245.6	221.1	260.5	258.8	281.4	330.0
Colombia	22.3	37.0	18.8	39.7	31.7	27.3	24.6
Brazil	38.4	31.0	12.4	20.0	9.6	7.2	7.4
Other Foreign Countries	70.3	64.4	40.4	41.7	47.8	39.0	35.4
Foreign Total	357.6	378.0	292.7	361.9	347.9	354.9	397.4
British East Africa	173.3	177.0	152.5	234.9	250.2	177.6	323.8
British India	32.4	93.0	26.0	80.1	53.9	23.5	88.6
British West Indies	3.1	5.0	4.7	3.9	2.8	3.1	5.0
Other British Countires	5.3	2.8	2.0	0.8	1.4	0.1	0.6
Empire Total	214.1	277.8	185.2	319.7	308.3	204.3	418.0
Total	571.7	655.8	477.9	681.6	656.2	559.2	815.5
Empire Share per cent.	37.4	42.4	38.8	46.9	47.0	36.5	51.3

TABLE 11

United Kingdom Imports and Re-Exports of Coffee (including Roasted and Ground) 1924-1930, in thousand cwts.

—	Gross Import	Retained	Re-Exported	Percentage retained	Percentage re-exported
1924	571·7	287·9	283·8	50·4	49·6
1925	655·8	442·5	213·3	67·5	32·5
1926	477·9	224·9	253·0	47·1	52·9
1927	681·6	406·1	275·5	59·6	40·4
1928	656·2	332·1	324·1	50·6	49·4
1929	559·2	313·4	245·8	56·0	44·0
1930	815·5	374·5	441·0	45·9	54·1
Total 1924 to 1930.	4,417·9	2,381·4	2,036·5	53·9	46·1

TABLE 12

Destination of Re-Exports of Coffee from the United Kingdom, 1924-1930, in thousand cwts.

—	U.S.A.	France	Germany	Belgium	Holland	Total, including other countries
1924	2·5	6·0	143·7	32·1	44·1	283·8
1925	8·2	3·8	118·6	5·8	34·6	213·3
1926	10·3	7·2	148·6	12·9	33·1	253·0
1927	7·7	16·8	155·3	8·8	38·5	275·5
1928	38·8	17·2	161·8	9·3	35·8	324·1
1929	4·8	4·1	152·6	3·6	24·4	245·8
1930	72·4	13·3	228·3	18·6	44·0	441·0
Total 1924-30	144·7	68·4	1,108·9	91·1	255·5	2,036·5
Percentage of total for the period.	7·1	3·3	54·3	4·5	12·5	—

TABLE 13

*Quantities of Empire and Foreign Grown Coffee in United Kingdom
Imports and Re-Exports of Raw Coffee (in thousand cwts.)*

—	1924	1927	1928	1929	1930
Total gross import from all countries	571·5	681·5	655·9	558·3	814·7
Empire Grown	214·1	319·8	308·3	204·3	418·0
Total re-exports	283·7	275·5	324·0	245·7	441·0
Empire grown	61·6	92·3	165·0	53·9	198·3
Total Retained Imports	287·8	406·0	331·9	312·6	373·7
Empire grown Retained Imports	152·5	227·5	143·3	150·4	219·7
Empire percentage of—					
Gross Imports	37·5	46·9	47·0	36·6	51·3
Re-exports	21·7	33·5	50·9	21·9	45·0
Retained Imports	53·0	56·0	43·0	48·1	58·8
Proportion of Empire grown im- ports re-exported	28·8	28·9	53·5	26·4	47·4

Empire percentage of total retained import for the years 1927-1930: 52.
Retained imports include stocks in bond. Figures for *consumption* are given in
Tables 20 and 21.

TABLE 14

Kenya Coffee in the United Kingdom

—	Quantities (cwts.)			Values (£)		
	Imported	Retained	Exported	Imported	Retained	Exported
1924	117,445	89,109	28,336	671,695	499,815	171,880
1925	140,746	124,323	16,423	971,388	872,061	99,327
1926	127,273	84,904	42,369	858,504	613,142	245,362
1927	194,866	156,493	38,373	1,320,024	1,105,137	214,887
1928	197,028	79,921	117,107	1,280,852	622,290	658,562
1929	126,713	105,713	21,000	799,074	674,384	124,690
1930	250,369	131,761	118,608	1,426,946	946,174	480,772

TABLE 15

Uganda Coffee in the United Kingdom

	Quantities (cwts.)			Values (£)		
	Imported	Retained	Exported	Imported	Retained	Exported
1924	31,893	29,959	1,934	170,037	157,999	12,038
1925	12,065	11,113	952	78,812	72,454	6,368
1926	6,694	4,927	1,767	40,648	29,907	10,741
1927	5,548	3,179	2,369	34,189	22,091	12,098
1928	5,241	1,788	3,453	32,358	13,697	18,661
1929	4,190	2,840	1,350	25,767	18,323	7,444
1930	13,019	2,762	10,257	69,305	30,170	39,135

TABLE 16

Tanganyika Coffee in the United Kingdom

	Quantities (cwts.)			Values (£)		
	Imported	Retained	Exported	Imported	Retained	Exported
1924	23,630	13,779	9,851	129,752	68,774	60,978
1925	24,028	18,044	5,984	155,186	120,504	34,682
1926	18,198	10,638	7,560	117,513	72,920	44,593
1927	34,257	30,412	3,845	221,782	197,761	24,021
1928	47,740	31,526	16,214	307,408	207,613	99,795
1929	46,248	28,889	17,359	276,082	176,872	99,210
1930	59,877	46,984	12,893	350,204	291,638	58,566

TABLE 17

Indian Coffee in the United Kingdom

	Quantities (cwts.)			Values (£)		
	Imported	Retained	Exported	Imported	Retained	Exported
1924	33,371	16,156	17,215	184,095	81,708	102,387
1925	93,026	66,861	26,165	694,631	510,030	184,601
1926	25,923	803	26,726	187,694	238	187,932
1927	80,157	36,080	44,077	576,734	288,956	287,778
1928	53,822	27,555	26,267	372,399	195,041	177,358
1929	23,502	11,109	12,393	168,052	80,270	87,782
1930	88,602	33,954	54,648	531,145	255,865	274,280

TABLE 18
British West Indian Coffee in the United Kingdom

	Quantities (cwts.)			Values (£)		
	Imported	Retained	Exported	Imported	Retained	Exported
1924	3,107	2,414	693	19,641	15,723	3,918
1925	5,071	4,656	415	37,831	35,048	2,783
1926	4,722	2,867	1,855	33,911	22,828	11,083
1927	3,929	2,897	1,032	30,897	24,944	5,953
1928	2,702	2,477	225	21,579	19,576	2,003
1929	2,755	2,401	354	25,950	23,269	2,681
1930	5,038	4,888	150	41,782	40,579	1,203

TABLE 19
Percentage share of Costa Rica and Empire grown coffee in United Kingdom trade in raw coffee

	1924	1927	1928	1929	1930
share of gross imports—					
Empire	37.5	46.9	47.0	36.6	51.3
Costa Rica	35.8	32.8	35.9	46.4	37.5
share of retained imports—					
Empire	53.0	56.0	43.0	48.1	58.8
Costa Rica	36.0	34.4	37.5	38.5	30.5
share of Re-Exports—					
Empire	21.7	33.5	50.9	21.9	45.0
Costa Rica	35.7	39.8	34.2	52.4	43.5
proportion of imports re-exported—					
Empire	28.8	28.9	53.5	26.4	47.4
Costa Rica	49.4	51.0	47.1	49.7	62.6

TABLE 20

Consumption of Empire and foreign-grown coffee in the United Kingdom (including roasted and ground) in thousand cwts.*

—	Empire grown	Foreign grown	Total	Empire grown percentage
1924	144.3	167.1	311.4	46.3
1925	151.2	165.7	316.9	47.7
1926	151.5	159.2	310.7	48.8
1927	154.7	169.7	324.4	47.7
1928	163.8	151.7	315.5	51.9
1929	146.1	165.6	311.7	46.9
1930	148.9	166.5	315.4	47.2

* The figure for consumption is that of the amount withdrawn from bond for home consumption on payment of duty.

TABLE 21

Consumption of Coffee and Chicory in the United Kingdom, 1909-1913, and 1922-1930, in thousand cwts.*

—	Coffee	Chicory	Total	Percentage of Chicory to total	Percentage of Chicory to Coffee
1909	264.9	73.1	338.0	21.6	27.6
1910	260.7	68.2	328.9	20.7	26.2
1911	250.3	70.4	320.7	22.0	28.1
1912	249.9	68.1	317.9	21.4	27.2
1913	250.9	65.7	316.6	20.8	26.2
1922	314.1	48.9	363.0	13.5	15.6
1923	315.9	55.1	371.0	14.8	17.4
1924	311.4	62.2	372.6	16.7	20.0
1925	316.9	59.3	376.2	15.7	19.3
1926	310.7	66.0	376.7	17.5	21.2
1927	324.4	61.5	385.9	15.9	19.0
1928	315.5	67.8	383.3	17.7	21.5
1929	311.7	59.4	371.1	16.0	19.0
1930	315.4	64.4	379.8	17.0	21.1

* The figure for consumption is that of the amount withdrawn from bond for home consumption on payment of duty.

TABLE 22

Average Wholesale Prices for Coffee in London, in Shillings per cwt.

	1925		1926		1927		1928		1929		1930	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Costa Rica	160	11	151	9	151	10	153	6	139	0	115	0
India	140	0	138	0	124	0	127	6	127	0	86	0
Tanganyika	127	2	119	9	119	4	117	6	110	6	77	9
Kenya	131	5	115	6	116	7	106	10	115	6	77	6
Uganda Arabica	117	9	105	5	94	6	97	5	98	3	63	6
Brazil Santos Superior (a)	109	1	99	10	81	1	102	9	96	7	56	4
„ Rio No. 7 (b)	94	0	85	0	68	0	76	0	73	0	40	0
Uganda Estate Robusta (c)	—	—	—	—	65	7	78	0	82	5	37	0
Bukoba Robusta (d)	86	0	70	0	53	0	75	0	60	0	28	0

(a) London C.I.F.

(b) New York Spot.

(c) Prior to 1927, prices for the two varieties of Uganda coffee were not distinguished in the price records.

(d) Prices for Bukoba Robusta are those ruling at the end of the year.

TABLE 23

Imports of Coffee and Chicory into the Dominion of Canada

	1927	1928	1929	1930
(A) Coffee (cwts. 000)				
Foreign grown	149.3	164.7	143.5	180.4
Empire grown	80.1	86.2	91.4	85.6
Total	229.4	250.9	234.9	267.0
Empire percentage	34.9	34.3	38.9	32.4
(B) Chicory (cwts. 000)	2.4	2.1	3.2	2.7

TABLE 24

Imports of Coffee and Chicory into the Commonwealth of Australia

	1927	1928	1929
(A) Coffee (cwts. 000)			
Netherlands E. Indies	15.9	17.8	14.3
India	5.5	10.3	4.3
Other countries	7.9	6.6	9.4
Total	28.3	34.7	28.0
(B) Chicory and other substitutes (cwts. 000)	2.5	4.2	1.1

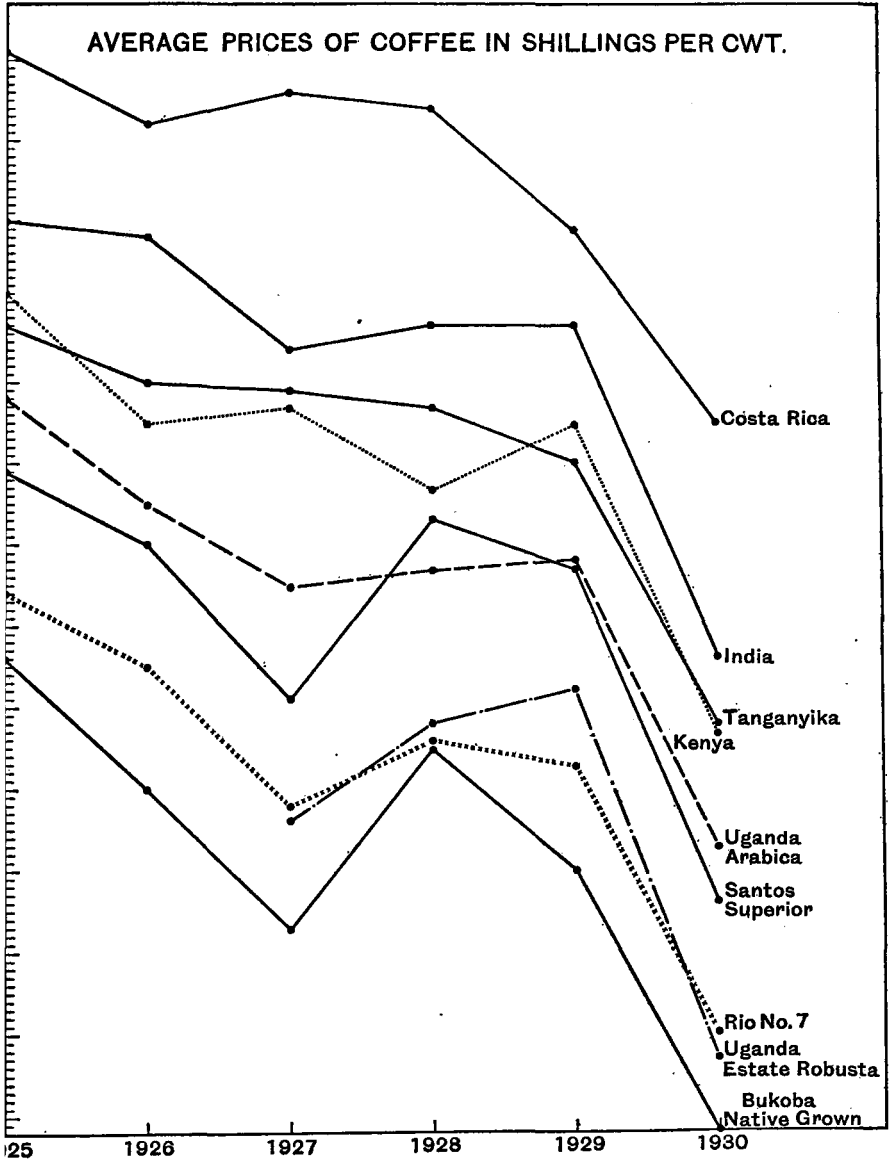
TABLE 25
Imports of Coffee into the Dominion of New Zealand

	1927	1928	1929
Total (cwts. 000)	3·6	3·0	3·8
Empire percentage	32·4	50·5	42·6

TABLE 26
Imports of Coffee and Chicory into the Union of South Africa

	1927	1928	1929
(A) Raw coffee in cwts. (000).			
Brazil	241·0	220·5	230·5
Netherlands E. Indies	9·8	3·6	6·3
Other foreign countries	2·1	2·8	4·2
Foreign Total	252·9	226·9	241·0
Empire Countries	10·8	10·8	13·7
Total	263·7	237·7	254·7
Empire percentage	4·1	4·5	5·4
Brazilian percentage	91·3	91·3	90·5
(B) Chicory and other substitutes (cwts. 000)	17·1	18·8	18·0

CHART A



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Reports of the
Imperial Economic Committee

Twenty-Third Report

WINE

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Twenty-Third Report Wine

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REPORT

We, the Imperial Economic Committee, appointed by the Governments of the United Kingdom, the Dominions, India, and the Colonies and Protectorates, acting under our terms of reference published on the 6th March, 1925, beg leave to present to the Governments of the Empire this our twenty-third report—THE PREPARING FOR MARKET AND MARKETING OF WINE.

2. We have examined a number of witnesses representing producing ^{Witnesses} and marketing interests as well as connoisseurs of wine, and have further had the advantage of consultation with experienced officials both of the United Kingdom and oversea Governments, and with men of scientific eminence. We thank them and all those who have appeared before us, or otherwise aided us in our enquiry, for their skilled assistance.

I.—INTRODUCTION.

3. Throughout the ages literature abounds in references to wine. No food, no other drink has similarly inspired the poet or stimulated the reformer. It "maketh glad the heart of man," on the other hand it is described as "a mocker." Whichever view may be favoured we, in this report, deal with wine as a commodity which Governments delight to tax.

4. Our enquiries have been especially directed towards the United Kingdom market and the prospects of increasing the Empire share therein. In all modern discussions on wines prominence is given to their "colour," their "aroma," their "bouquet," their "style"; but the hard commercial fact remains that fashions, even in wine, change and that the prevalent demand in the United Kingdom (and probably elsewhere also) has been altered from time to time as the result of fiscal measures. The discovery of "Port" was a direct result of a fiscal "preference," and it led to a definite and permanent change in English taste. A withdrawal of preference for "Cape" wines in 1860 led to their practical disappearance in the English market. The recent growth in the consumption of wines from the Empire overseas dates from 1927 when a substantial "preference" was given. And generally, there is reason to believe that the heavy increases in taxation on beer and spirits since the war have lessened the decrease in the consumption of wine which otherwise would doubtless have occurred as a result of increases in the duties on wine. No discussion of the prevalent demand for particular types of wine should ignore the effects of fiscal measures.

5. None the less it is an error to conclude that the tastes of the consuming public can be completely changed by Acts of Parliament. French wines were smuggled into England on a large scale when all the weight of legal enactments favoured those of Portugal, and during the period of its preference, "Port" became so established, on account of its flavour and quality, that at a later date it withstood

not only the withdrawal of all preference but also heavier duties than the lighter wines of France. This result is in marked contrast with the fate of the "Cape" wines at the end of their first period of preference. The consuming public had not, during those first years of preference, learnt to identify the Cape wines with the particular characteristics they desired. In fact, most of that wine then imported was used for blending, and when the preference was withdrawn the imports diminished.

II.—WORLD PRODUCTION OF WINE.

Antiquity of the wine trade.

6. Few trades in the world can claim a greater antiquity than the trade in Wine. The vine was cultivated and its fruit transformed into wine in ancient times. The Egyptians, Persians, Phoenicians, Greeks and Romans habitually made and drank wine. Noah planted a vineyard. In China, viticulture flourished from 2,000 B.C. until the fourteenth century. It is not certain whether the Romans introduced vine growing into Britain and the northern parts of Europe or whether they imported their supplies from the south, but after the collapse of the Empire, when civilisation was maintained in scattered Christian communities, the art of vine growing and wine making was introduced into northern Europe. In Britain, as far north as Scotland, vineyards were planted and provided wine for the communities before the Normans made the English Channel safe from the pirates who had hitherto rendered the supply of imported wine very precarious.

Alternative beverages.

7. In the countries which have depended largely upon imports of wine, supplies have been for many centuries supplemented by beer. In the nineteenth century tea, coffee and cocoa, and, to a certain extent, spirits have replaced wine in many parts of the world. To-day, except in the wine producing countries, wine is a luxury beverage chiefly connected with the ritual of entertainment.

Importance to producing countries.

8. Only in the Mediterranean countries and in the Latin countries of Western and Southern Europe is wine a "drink of the country." In these countries wine making is one of the most important and widespread industries. In France some 3½ million acres of vineyards are cultivated and the industry is a great source of national wealth. In Italy 10½ million acres, or 14 per cent. of the whole national territory, are under vineyards and the output is valued at between 60 to 80 million sterling or a quarter of the value of the national agricultural production. In Spain (3·7 million acres), Portugal (847,000 acres) and Algeria (½ million acres), the vine holds a comparably important position in the national economy. During recent years, particularly since the end of the war, the vine has become increasingly important in Australia, in the Union of South Africa, and in Cyprus and Palestine.

Vine growing areas of the world.

9. Although the vine will flourish in most parts of the world except arctic and tropic regions, it grows best and produces the finest wines in temperate climates. Its cultivation is limited by altitude and latitude, by cold on the one hand and absence of moisture

on the other. In addition to a temperate climate the cultivation of the vine requires a population settled to the pursuit of agriculture, since not only is the vine some years establishing itself, but also the wine must be stored some time before its finer qualities can be developed. It is a typical product of the countries enjoying what geographers call a Mediterranean type of climate, with warm summers and winter rains. In addition to the countries of the Mediterranean basin, the countries with this type of climate are the Californian valley, the central part of Chile, the western parts of Cape Province in South Africa, the south-west of Western Australia, the south of South Australia, Victoria and Southern New South Wales in Australia. These are the countries in which the vine is freely cultivated, though, in addition, its successful cultivation extends in Continental areas to Argentina, and as far north as the Rhineland in Europe and the Niagara peninsula in Ontario. With the exception, to some extent, of North America, the vine generally cultivated in these numerous wine producing countries is on the whole the same species.

10. The world annual production of wine is, in round figures, 4,000 million gallons. France (which produces about a quarter of the total), Italy, Spain, Algeria, Argentina, Roumania and Portugal are, in that order, the greatest producing countries and these seven countries together account for three-quarters of the total world production.*

The following table shows the average annual production of wine in the principal producing countries from 1926 to 1930. Details of production in the wine growing countries are given in Appendix II.

Empire Countries.	Production.	Foreign Countries.	Production.
	Thous. Galls.		Thous. Galls.
Australia	17,720	France	1,139,714 ¹
South Africa	18,925	Italy	866,260
Cyprus	4,935	Spain	481,257
Canada... ..	4,340	Algeria	248,660
Malta	859	Roumania	143,970
Palestine (Mandated Territory).	544	Argentina	143,950
		Portugal	132,985 ²
		Yugo-Slavia	74,841
		Chile	71,695
		Hungary	55,937
		Greece	52,643
		Germany	40,929
		Bulgaria	39,714

¹ Presumably includes wine made from imported grapes or "must."

² Of which some 8 million gallons was "port."

11. In the "trade" as well as in common parlance wines are usually divided into two categories, dry and sweet, of which claret

Types of Wine.

* Annual average production of the seven countries, 1926-30, was 3,013 million gallons.

and port respectively serve as samples. For the purpose of this report we follow this practice, though each type of wine possesses special characteristics, arising largely from differing methods of treatment of the grape juice. Broadly, there are five methods. The dry wines are those naturally and more or less completely fermented such as claret, burgundy, hock and moselle. The sparkling wines are bottled before fermentation is complete, so that they retain some of the gas produced during fermentation. Wines sweeter than either of the above types, such as sauternes, are produced from fully ripe grapes and contain a comparatively high proportion of sugar. Then there are the fortified wines, in the making of which alcohol is added before fermentation is complete, causing the proportion of alcohol, and usually of sugar, to be high. Port and sherry are in this class. In addition, there are the liqueur wines in which special flavourings are added during manufacture. For the purpose of this report, however, we use the word "sweet" to denote the fortified wines such as port and sherry, and "dry" to denote the above first three classes, comprising the large and varied range from clarets, hocks and champagnes to sauternes. The liqueur wines, when mentioned, are definitely described as such.

' Bulk " and
" Special "
supplies of
wine.

12. Of the great quantity of wine annually produced in the world by far the larger portion is good, wholesome wine mostly consumed in the countries where it is grown. A very small proportion of the total world production consists of wine of superlative quality which pays for great care and attention while it matures, sometimes for many years, and which appeals chiefly to a class of special consumers trained to appreciate it.

This small proportion of the whole includes the vintage ports, châteaux wines, old sherrys and a few special types of wine. The trade in these wines is mostly in the hands of the merchants of the older wine-producing countries—France, Portugal, Germany and Spain. The Empire wine producers are not yet in a position to compete in this field. Some wines of superlative quality can be selected from the produce of Australia and South Africa, but the quantities made are small, the names are not generally known and the producers have not, so far, found it profitable to make them commercially. At present these countries mainly produce types suitable for the bulk of the wine trade. In this field the wines they market compare favourably with similar types of wine produced in foreign countries. The oversea Empire countries producing wine consume comparatively small quantities themselves, and are largely dependent on the export trade. They have already secured a considerable market in the United Kingdom, but there is still scope for a much greater development of their share in that market, and this is necessary if the increasing Empire production is to be absorbed. In fact, scope exists in almost all Empire countries for a much greater share of their wine markets to be given to the great vineyards of the Empire.

III.—POSITION OF THE EMPIRE IN THE WORLD WINE INDUSTRY.

13. As we have shown in the table in paragraph 10, the wine ^{Empire} producing countries of the British Empire are Australia, South Africa, Canada, Cyprus and Malta. To these may be added the mandated territory of Palestine. The average annual production in these six countries for 1926 to 1930 amounted to 47,575,000 gallons or only 1·31 per cent. of the total world production which was, in 1930, 3,618 million gallons. In addition, some 2½ million gallons of wines are made in the United Kingdom, from imported grape juice or "must". They are dealt with separately in this report. In comparison with the long history and established reputation of the wines produced in the principal wine producing countries of the world, the Australian and even the South African wine trades are recent developments. The wine industry in Cyprus and Palestine, although dating back into antiquity, had fallen off both in quantity and quality, and it is only in recent years that efforts have been made to re-establish a reputation for the wines of these two countries. The wine industry of Canada is expanding slowly, and the product is mostly consumed locally. The exports are small and chiefly consist of sacramental wine consigned to the United States. The wine produced in Malta is consumed locally.

14. The large producers of wine in the Empire are Australia and South Africa. There, in contrast with European countries producing wine, local consumption is very small and consequently the vine growers in Australia and South Africa depend on the export trade for the success of their wine industries. Their chief market is in the United Kingdom. The next important market for both the Dominions is New Zealand. The quantities exported from Australia to foreign markets are small. On the other hand, about five per cent. of the total exports of South Africa go to foreign countries. The largest foreign market for South African wine is Holland to which 18,280 gallons were exported in 1930, and 15,259 gallons in 1931. The Belgian Congo and Germany took 4,777 gallons and 19,820 gallons respectively in 1931. Small quantities were also exported to some eighteen other foreign markets. Details of the destinations of all exports of wine from Australia and South Africa in 1929, 1930 and 1931, are given in Appendix III, from which the following table has been abstracted:

Exported to.	Quantities: Thousands of Gallons.					Percentage.				
	Australia.		South Africa.			Australia.		South Africa.		
	1928-29.	1929-30.	1929.	1930.	1931.	1928-29.	1929-30.	1929.	1930.	1931.
United Kingdom	1,613	2,012	502	572	823	92·62	92·22	87·40	88·52	91·48
New Zealand	102	132	45	36	19	5·88	6·04	7·83	5·56	2·11
Other British Countries.	25	38	1	3	14	1·45	1·72	0·25	0·44	1·59
Foreign Countries	0·8	0·4	26	35	43	0·05	0·02	4·52	5·48	4·82
TOTAL	1,740·8	2,182·4	574	646	899	100·00	100·00	100·00	100·00	100·00

IV.—WINE MAKING.

Variety of
vine.

15. The variety of vine affects the style and quality of the wine, the nature of the soil affects the growth and produce of the different species. Again, quality is affected by the climate, altitude and aspect of the vineyards, and will furthermore vary according to the different weather conditions prevailing from year to year. The same species of vine produces very different wines if grown under different conditions. The choice of variety with a view to the conditions to be met and the nature of the wine it is desired to produce is therefore important.

Vinification.

16. The striking differences between the various kinds of wine, however, depend upon the process of vinification. Light or dark, red or white, sweet, dry or sparkling wines are the result of different methods of dealing with the grape juice or must during the processes which convert it into wine.

The art of
wine making.

17. The crushed grapes with their juice, pulp, skins, pips and stalks are known as must. In the primitive industry the must is produced by treading the grapes with the naked feet, but in the more highly developed industry of modern times power presses are used. These are specially designed in various ways so that they do not crush the pips which would impart an unpleasant flavour to the wine. Occasionally (in the making of medoc, for instance) the grapes are not crushed, but are roughly torn from their stalks so that the skins burst in the process.

In the course of ripening, yeast cells have settled on the skins of the grapes, and, as soon as the grapes are crushed, fermentation begins. Fermentation can be arrested at any stage by the addition of certain chemicals (which can later be removed) by causing an excess of sugar by the addition of alcohol, or by raising the temperature. The length of time that the skins, stalks and pips are allowed to remain in the fermenting mass affects the flavour, aroma and colour of the wine. The type of wine produced depends upon whether complete fermentation is allowed, whether the wine is bottled before fermentation is finished, or whether alcohol is added while a considerable proportion of the grape sugar is still unconverted.

Research
during the
vintage.

18. From the time of crushing the grapes the best wine makers constantly test the must and the wine to determine the proportions of the various vegetable and mineral substances and to detect any causes which might prejudicially affect the wine. This laboratory examination is of very great importance.

Blending.

19. After fermentation and maturation, control of which is vital, the most important factor in the art of wine making is blending. With a few exceptions, mainly of the highest class of

dry wine, practically all wines are blended, or could be improved by judicious blending. Lack of acidity, for example, and other faults which a wine may have can often be overcome by blending and the resultant wine made to attain a desired standard. When it is remembered that the weather during the whole growth of the vine is a most important factor, it will be apparent that judicious blending serves to maintain standards of quality and flavour.

20. Brandy is obtained from the distillation of wine. In the process of distillation the alcohol is separated from the wine with only a small proportion of the other volatile ethers, esters and water. The spirit so obtained is used for fortifying other wine, or it is marketed as brandy. In view of the origin of brandy and of its use in wine making we also deal with brandy in this report.

21. A comparatively recent, but a considerable trade has arisen in unfermented grape juice (that is, "must"). As fermentation begins immediately the grapes are crushed, and as it would be impossible to deal with such a process as fermentation during transit, it is necessary to arrest fermentation before the must is transported. Fermentation can be arrested in four ways: (1) by the addition of alcohol or sugar, (2) by adding sulphur dioxide, which can later be driven off, (3) by pasteurisation and (4) by concentration. The last process, which is that usually adopted in South Africa and Cyprus, consists in removing some of the water content of the must under pressure *in vacuo* at low temperature and immediately sealing it in steel drums. The concentrated must is usually reduced to a density about twice that of the natural must.

V.—WORLD CONSUMPTION OF WINE.

22. Generally the great producing countries are also the great consuming countries. France, although the largest producer of wine, is the largest importer, taking annually some 260 million gallons of wine chiefly from Algeria, Spain, Greece, Tunis and Italy, whereas French exports of wine are only about 30 million gallons a year. In Portugal, production of wine in 1929 amounted to 114½ million gallons. Exports were only 21 million gallons or a little over 18 per cent. Whereas production of wine in Italy amounts to 884 million gallons, exports are only some 22 million gallons or 2½ per cent. Barely 20 per cent. of the production of wine in Spain is exported. Algeria is an exception, but the bulk of the Algerian output (70 per cent. in 1929) goes to France.

Australia and South Africa are, however, very small consumers of wine. Annual consumption of wine in Australia is only 6·3 pints per head of the population, and in South Africa it is only 15 pints.

The following table shows the annual per caput consumption of wine in the chief consuming countries.¹

<i>Country.</i>	<i>Annual per caput consumption, pints.</i>
South Africa ²	15·0
Australia	6·3
Irish Free State	2·0
United Kingdom	2·8
Canada	1·9
New Zealand	1·2
France ³	455·0
Italy ³	303·4
Spain	154·4
Portugal ³ (estimated)	99·4
Switzerland	79·5
Greece	62·5
Hungary	57·1
Bulgaria	38·3
Roumania	26·0
Austria	25·5
Yugo-Slavia	17·1
Belgium	14·4
Argentina	10·2
Germany	7·1
Czecho-Slovakia	5·5
Norway	4·6

VI.—UNITED KINGDOM MARKET FOR WINE.

Early
history.

23. The Romans had doubtless imported some wine for their own use, but no regular trade in wine was established. Notwithstanding the climatic disadvantages, they probably introduced the cultivation of the vine into Britain. The religious communities which later settled in England, through their communications with their houses on the Continent, served to establish the foreign trade in wine. Evidence exists of the importation of wine into England in the fifth century. The Saxon conquerors destroyed the foreign trade in wine which was not revived until the latter half of the tenth century, the time of Alfred. The English Channel was then, however, unsafe owing to piracy and to ensure supplies of wine in Britain it was necessary to keep up the vineyards. The Domesday Survey contains at least 38 entries of existing vineyards. The wine produced in Britain was probably, except in favourable seasons, of poor quality and very dry, so that it required considerable manipulation

¹ Figures, except where noted, are based on an extract from the "Norwegian Government Statistics Book, 1930," submitted to the Royal Commission on Licensing.

² Based on apparent consumption—i.e. production + imports — exports.

³ Based on figures published in "Annuaire International du Vin, 1931."

before it was fit to drink. The quantity produced also varied greatly from year to year, owing to the erratic summer weather. With the Norman Conquest more secure trade in wine with France was made possible. Wine was still produced in England, but after the reign of Henry III, the vineyards were neglected except in some very few cases in which cultivation was maintained until recent times. The consumption of wine in England became considerable after the Norman Conquest, but wine was not, except perhaps in London, an article of general consumption among the people either in their homes or in the taverns until the fourteenth century. An arbitrary toll taken on behalf of the King from wine-laden ships rendered the profit likely to accrue to the merchant uncertain. Early in the fourteenth century, however, a change was made and *prisage*, as the King's toll was called, was regularised. Merchants then knew exactly what would be taken from each ship and so increased their ventures with the result that the consumption of wine and the number of taverns greatly increased. On the separation of Aquitaine from the English crown the supply of Bordeaux wine fell off, but increasing quantities were imported from Spain and the Levant. The consumption of malmsey from Crete and other sweet wines became more general. By the fifteenth century a class of wine, called by the legislature "sweet wines"—including malmsey, romney, madeira, canary, sack, alicant and other sweet wines—had been introduced. The price of these wines in England was always higher than that of other wines. The average annual imports of wine into England from 1699 to 1702 were:—

From	Tuns ¹
Spain and the Canaries.. .. .	9,039
Portugal.. .. .	6,897
Italy	1,508
France	1,245

24. In 1667, owing to the supremacy of the Mercantile System in France, the French introduced high duties on many articles imported from England, and in retaliation additional duties were imposed on French wines imported into England. In 1677 importation of French wine was prohibited for three years. The prohibition was soon removed but was re-imposed on the outbreak of war after the English Revolution. As the result of these changes, the course of trade was diverted and French wines were sent indirectly to England through Spain and Portugal. Thus began a trade in wine between Portugal and England. The Portuguese were stimulated to increase their own production particularly of red wines. These wines became popular with the English who also approved of this trade with Portugal on account of the theory of the favourable balance of trade which obtained at the time. During the

Growth of
trade with
Portugal.

¹ A tun = 252 gallons approximately.

Marlborough wars an attempt was therefore made to ruin one of the most important branches of French trade while at the same time benefiting the English wool trade. The Methuen Treaty, concluded with Portugal in 1703, provided an open market for English woollens and free access for British troops into the Peninsula while a preference was given to Portuguese wines. The duty on these wines was to be no more than one-third of the duty charged on French wines.

Port wine.

25. The immediate result of the Methuen Treaty was a rapid decline in the wine trade with France although large quantities of wine from France were brought to England by smugglers. It has been estimated that more than half the French wine in England was wine on which no duty had been paid.¹ Consumption of Portuguese wines did not increase materially at once but the protected market for them in England greatly stimulated their production. Plantings of new vineyards were made, particularly in the Upper Douro valley. The great heights and abrupt gradients in this area had hitherto rendered agriculture or viticulture impossible. The vine grew well in the Douro and produced more abundant supplies of sweeter grapes, but the resultant wine was tart and very unpopular in England, where in spite of the great revenue preference, Portuguese wines declined in popularity. Their only recommendation was their comparative cheapness. However, before long, an attempt was made to overcome this excessive tartness by a change in the method of manufacture. Some of the wine was distilled and the spirit used to fortify the rest at a stage in the course of fermentation when a considerable proportion of sugar was still present in the wine. At first this wine was little better, but it was found that it improved with age. The result was the incomparable matured port wine. Incidentally the necessity for maturing wine in bottle led to the evolution of the cylindrical glass bottle. Before this time the only function of a bottle had been to hold the wine in use at the table and the usual pattern was a broad based bottle which would have been useless for storing on its side.² Port wine attained great popularity in Britain until it practically ousted all other kinds of wine from the market.

Mr. Gladstone's Tariff changes.

26. This state of affairs was brought to an end in 1860 when Mr. Gladstone attempted to re-introduce the taste for light dry wines by changing the principle on which wine duties were based. He introduced a scale of taxation based on the strength of the wine according to its alcoholic content. Under this system, which is still in use, absolute alcohol is equivalent to 175 degrees, and the strength of wine is expressed in degrees of alcoholic content. Wine containing less than 18 degrees was taxed at 1s. a gallon, more than 18 degrees but less than 26 degrees at 1s. 9d., more than 26 degrees but less than 40 degrees at 2s. 5d. and not exceeding 45 degrees at 2s. 11d. Wine containing 45 degrees or more was deemed mixed

¹ "History of Taxation and Taxes in England."—S. Dowell.

² "History of the Wine Trade in England."—A. L. Simon.

spirit and charged with duty as such⁽¹⁾. At first wine in bottle was charged on a different basis, but later it was taxed at the same rate as wine in cask. In 1876 the duties were amended as follows:—

Less than 26°, 1s. ; 26° to 42°, 2s. 6*d.* ; for every degree beyond 42° an additional 3*d.*

Imports and consumption of wine greatly increased until between 1868 and 1883, the annual consumption of wine was well over 16 million gallons. In the eighties, the phylloxera beetle⁽²⁾ ravaged the vineyards in most parts of the world. Supplies of good wine became scarce, but the demand for cheap wine led to the marketing of many inferior kinds, with the result that wine became less popular. Consumption of wine from 1903 up to the end of the war was round about 12 million gallons a year in the United Kingdom.

27. The consumption of wine in the United Kingdom has been remarkably steady for about fifty years. The average annual per caput consumption of imported wine during the years 1924 to 1930 was 2·67 pints. With the exception of the nine years 1905 to 1913 during which it declined to an average of 2·12 pints a year, this is practically the same rate of consumption as from 1886. The following diagram shows the quantities of wine released from bond for consumption in the United Kingdom from 1909. Releases from bond in 1919 and 1920, immediately after the war, were exceptionally large due to the necessity for replenishing both private and merchants' stocks. Thereafter consumption rose steadily until 1927, when, following increased duties, it declined. The increase in 1929, though due partly to an actual increase of consumption was mainly due to forestalling in expectation of higher duties and to importation for bottling of the 1927 vintage ports.⁽³⁾ At the same time increased fiscal preference for imported Empire wine was given and consumption of these wines rose considerably until in 1930 they formed over 21 per cent. of the total wine consumed. This increase continued in

Consumption
of wine in
United
Kingdom.

¹ This system of taxation is still in use. The alcoholic strength is gauged by the specific gravity which is determined by a special form of hydrometer known as Syke's hydrometer. The duty is charged on the amount of proof spirit in the wine. Proof spirit is defined as "such as shall at a temperature of 51° F. weigh exactly $\frac{1}{3}$ part of an equal measure of distilled water." This corresponds to 49·3 per cent. by weight, or 57·09 per cent. by volume of alcohol. To estimate the amount of proof spirit in wine which besides alcohol and water contains other ingredients which affect the specific gravity, some of the liquid is distilled. A certain volume of wine is measured and distilled until about one-half of the liquid, which will contain all the alcohol, has passed over. The distillate is then made up to the original volume with distilled water and its specific gravity measured by the Syke's hydrometer. The strength of the wine is then described as so many degrees of proof spirit. Thus a wine of 34° contains 34° of proof spirit (which is by volume 57·09 per cent. alcohol) or 19·4 per cent. alcohol.

² An insect pest particularly destructive to vines.

³ Vintage ports are usually imported for bottling two years after the vintage. The "port" of 1927 was generally shipped as a vintage wine.

1931 in spite of a further decline in wine consumption. The following table shows the quantities of wine withdrawn from bond from 1909 to 1931, as well as the quantities of Empire wine and the percentage which Empire wine bears to total consumption. British wines made in the United Kingdom are not included in this table.

Wine Consumption in the United Kingdom.

Calendar Year.	Empire Wine.	Total Wine.	Empire Percentage of Total.	Calendar Year.	Empire Wine.	Total Wine.	Empire Percentage of Total.
	Thous. gallons.		Per cent.		Thous. gallons.		Per cent.
1909	884	11,449	7·7	1921	747	11,175	6·7
1910	927	12,719	7·3	1922	717	12,549	5·7
1911	980	11,273	8·7	1923	833	13,461	6·2
1912	900	11,284	8·0	1924 ¹	831	15,335	5·4
1913	1,049	11,421	9·2	1925	998	16,071	6·2
1914	999	10,630	9·4	1926	1,644	16,787	9·8
1915	1,029	10,175	10·1	1927	2,554	16,909	15·1
1916	865	9,910	8·7	1928	2,488	13,467	18·5
1917	510	7,099	7·2	1929	2,763	14,394	19·2
1918	388	11,317	3·4	1930	2,780	13,731	20·3
1919	533	19,174	2·8	1931	3,219	13,716	23·5

¹ Figures prior to 1924 include the Irish Free State.

The trend of wine consumption in the United Kingdom and the Empire share is shown in diagram I. Detailed figures are given in Appendices I and IV, Table A.

The following table shows the quantity of wine entered for home consumption during the first three months of 1932, compared with that for the similar period in 1930 and 1931 :—

United Kingdom : Wine Consumption.

	Three months ended 31st March.		
	1930.	1931.	1932.
Empire	Gallons. 796,062	Gallons. 820,296	Gallons. 900,453
Foreign	3,238,997	2,822,540	1,792,208
Total	4,035,059	3,642,836	2,692,661

Change in consumption of types of wine.

28. Diagram I shows clearly that the decrease in consumption of all kinds of wine has been borne entirely by foreign wines. Consumption of imported Empire wines has continued a steady increase throughout, at a higher level since the grant of fiscal preference. The following Diagram II shows the trend of consumption of the more important types of wine included in the total. It is based on annual figures and shows the general tendency observed in Diagram I,

DIAGRAM I.
WINE entered for consumption
in the United Kingdom.

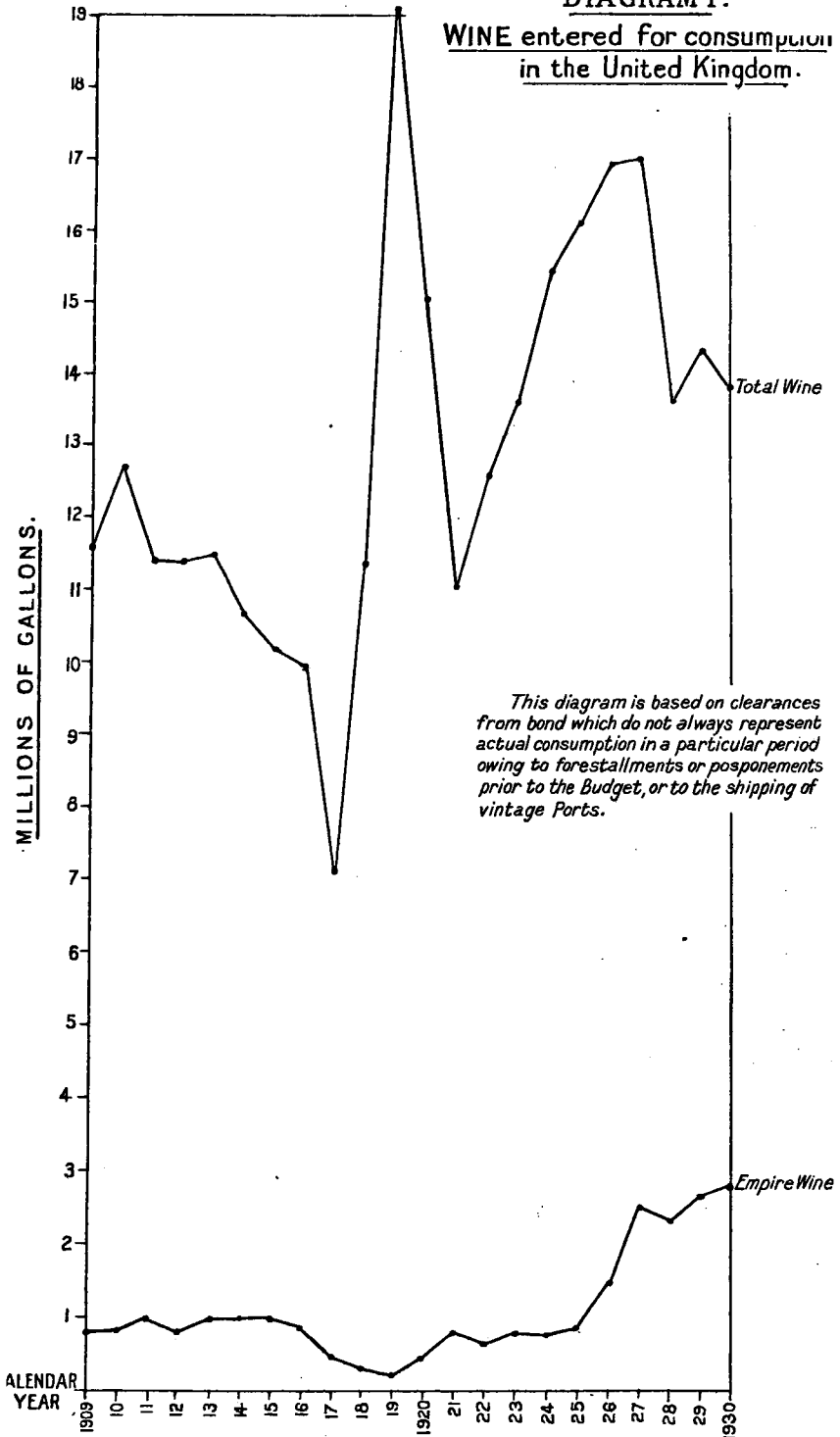
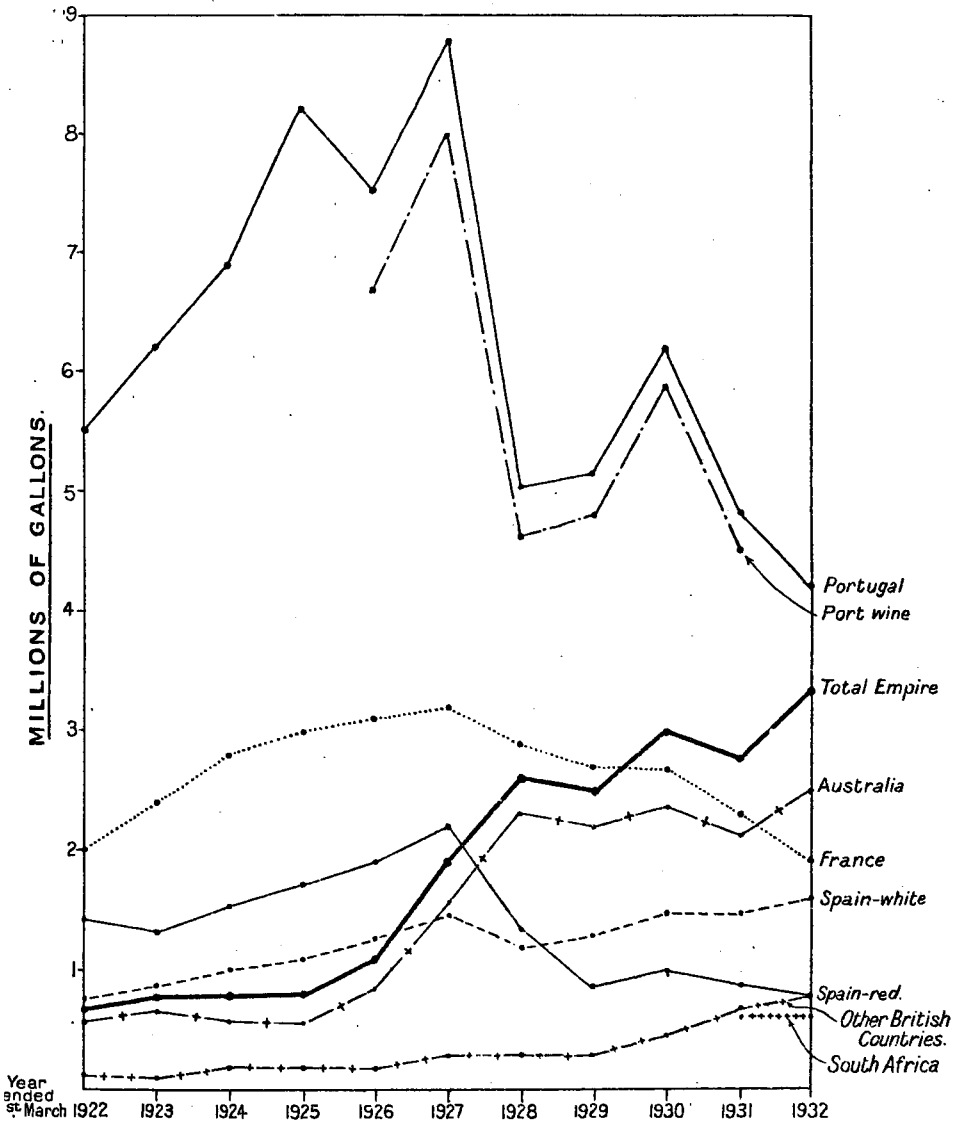


DIAGRAM II.
UNITED KINGDOM:

WINE retained for consumption: countries whence consigned.



but further indicates how those total figures are the result of a different combination of the various kinds of wine consumed. The greatest decrease since 1927 has been in the consumption of port wine and Spanish red wines. French wines have gradually declined. The increase in consumption of Australian wines was not maintained in the year ended 31st March, 1931, but the decline was largely offset by a notable increase in the consumption of South African wines. The provisional figures for the year ended 31st March, 1932, indicate a further increase in the consumption of Australian wines above the level of the year 1929-30. The only other type of wine the consumption of which increased was Spanish white wine—sherry. This corroborates evidence put before us that a revival of the taste for sherry has occurred in the United Kingdom. Dry sherry is tending to rival in popularity the cocktail as an appetiser.

29. Details of the types of wine consumed in the United Kingdom are shown in the following table which indicates the consumption of imported wines divided into dry, or light wines and sweet, or heavy. Heavy wines are further sub-divided into port wine and other kinds. Sweet, or heavy wine, in the table is, for Empire wines, 27° and over and for foreign wine, 25° and over. Port is the wine which is legally so described in accordance with the Anglo-Portuguese Treaty.

Consumption of imported wines in the United Kingdom in the four fiscal years ended 31st March, (a) 1928, (b), 1929, (c), 1930 and (d) 1931. (Quantities in thousands of gallons).

Total.			
(a)	14,054		
(b)	13,437		
(c)	15,425		
(d)	13,329		
Heavy (Sweet).		Light (Dry).	
(a)	8,186—58%	5,868—42%	
(b)	8,294—61·7%	5,143—38·3%	
(c)	9,876—64%	5,549—36%	
(d)	8,472—63·6%	4,857—36·4%	
Empire.		Foreign.	
(a)	1,769—21·7%	6,417—78·3%	
(b)	1,860—22·4%	6,434—77·6%	
(c)	2,224—22·5%	7,652—77·5%	
(d)	2,163—25·5%	6,309—74·5%	
Empire.		Foreign.	
(a)	713—12·1%	5,155—87·9%	
(b)	556—10·8%	4,587—89·2%	
(c)	674—12·1%	4,875—87·9%	
(d)	588—12·1%	4,269—87·9%	
"Port."		Other kinds.	
(a)	4,602—71·8%	1,815—28·2%	
(b)	4,846—75·3%	1,588—24·7%	
(c)	5,874—76·7%	1,778—23·3%	
(d)	4,540—72·0%	1,769—28·0%	

Comparisons in this form cannot be made with earlier years because, in 1927, the line of demarcation between heavy and light wines was altered from 30° to 25° in the case of foreign wines, and to 27° in the case of Empire wines. In 1927, also, increased fiscal preference was given in the United Kingdom to wines imported from Empire countries.

Consumption
of beer and
spirits.

30. The comparative steadiness in the rate of consumption of wine in the United Kingdom is in marked contrast with the changes in the consumption of beer and spirits which has declined since the war, chiefly as the result of high duties. Per caput consumption of beer has dropped from an average of over 200 pints a year in the ten years immediately preceding the war to a yearly average of 127 pints in the ten years 1920 to 1929. Consumption of beer declined further by about 5 per cent. in the financial year 1930-31. The decrease in per caput consumption of spirits of all kinds in the same time has been from nearly 6 pints to little over 2 pints of proof spirit. Statistics of the consumption of wine, beer, and spirits in the United Kingdom over a series of years are given in Appendix I.

Sale of wines
in the United
Kingdom.

31. The sale of wine in the United Kingdom is different in the case of the two main classes of wine. The dry wines are mostly consumed in the home, in hotels and in clubs. It is thus very largely a bottle trade. The dry wines consumed in the home are bought mainly from off-licenses or from grocery stores which have a wine license. Sweet wines, on the other hand, are consumed largely in public-houses where they are often sold from bulk. A large trade is also carried on in bottled sweet wines by the grocers and off-licenses. A considerable trade exists in medicinal and tonic wines.

VII.—DUTIES ON WINE.

Effects of
taxation
on wine
consumption.

32. Wine in England has never had a free market. "The spigot of taxation has in England been deeply driven into the wine cask." Indeed, it may be said that Chancellors of the Exchequer, through taxation, have determined not only the number of glasses a consumer can afford to drink, but also the type of liquor he is to put in them. In many other countries wine has been taxed either for revenue or, more generally, for the protection of local wine-producers. The demand for wine is also influenced by the taxation on other alcoholic drinks such as spirits and beer, and the comparatively steady consumption of wine in the United Kingdom since the war is in no small degree due to the increased taxation on spirits and beer. In spite of the fact that wine duties were doubled in 1920, the consumption of wine continued to increase so that in 1926 it was fifty per cent. higher than in pre-war years or than in 1921.

Present rates
of duty in
the United
Kingdom.

33. The present (1932) duties in force are those imposed in 1927. All wine duties were then raised and the scales of duty were re-arranged so as to render a larger proportion of wine liable to higher rates. Since 1862, duties on wines of high alcoholic content have

been relatively higher than those on light wines. Until 1927 the dividing line was drawn at an "alcoholic strength of 30 degrees". (See footnote to paragraph 26.) In that year it was lowered with the object of rendering wines which had been fortified with additional spirit liable to higher duties than those of natural strength. In the case of foreign wines the line was placed at 25°. As Empire wines naturally develop a higher alcoholic strength, it was decided to fix the dividing line for them at a higher point in the scale, namely 27°, which the Chancellor of the Exchequer described "as a further measure of preference for them". The present duties on wine are as follows :—

Empire wine—

Not exceeding 27°	2s. a gallon
Exceeding 27° but not exceeding 42°	4s. a gallon
For every degree or part of a degree over 42°	4d. a gallon

Foreign wine—

Not exceeding 25°	3s. a gallon
Exceeding 25° but not exceeding 42°	8s. a gallon
For every degree or part of a degree over 42° ..	8d. a gallon

On sparkling wines an additional duty is charged of 6s. 3d. a gallon on Empire wines and 12s. 6d. on foreign wines. At the same time an excise duty of 1s. a gallon was imposed on British wines (that is, wines made in the United Kingdom from imported materials). This excise was increased to 1s. 6d. a gallon in 1928.

34. The following table gives the receipts from customs duties on imported wines of all kinds in recent years : Receipts from wine duties.

Wine : Customs receipts.

Twelve months ended 31st March.	Consumption.	Receipts.
	Thousand Galls.	£000.
1914 ¹	11,637	1,152
1923	12,316	3,033
1924	13,835	3,369
1925	15,654	3,752
1926	16,017	3,746
1927	18,721	4,329
1928	14,054	4,149
1929	13,437	4,248
1930	15,425	4,881
1931	13,329	4,096

¹ Includes Irish Free State.

The next table shows how this revenue has been divided between heavy wines, light wines, and sparkling wines since 1927, when the dividing line between heavy wines and light wines was changed from 30° to 25° for foreign wines, and from 30° to 27° for Empire wines.

Wine : Consumption and receipts.

Year.	At higher Rates of Duty.	At lower Rates of Duty.	Sparkling Wines.
	£	£	£
1927-28	2,788,405	731,425	630,053
1928-29	2,967,320	648,641	634,281
1929-30	3,528,937	700,625	652,456
1930-31	2,978,511	630,264	488,133

35. During those four years 1927-28 to 1930-31 the rates of duty remained unaltered. Yet the revenue derived from clearances of sparkling wines fell by 25 per cent. between 1929-30 and the following fiscal year. On the light wines the fall was 10 per cent. and on the heavy wines nearly 16 per cent. These substantial decreases in one year, following on the whole three years of steady or even slowly expanding revenue, must be attributed—certainly so far as the sparkling and light wines are concerned—to the severe general economic depression which developed in and after the autumn of 1929. The connection between the economic depression and the revenue on heavy wines is not so clear as it is in the case of the sparkling and light wines, because in 1929-30 a considerable quantity of the vintage port of 1927 was shipped and cleared (*see* page 19, note 3).

VIII.—QUALITY OF WINE.

Special meaning of quality of wine.

36. Quality, as applied to wine, has a special meaning for the connoisseur or the person accustomed to wine, but it is difficult to define. It is not susceptible of scientific analysis and language fails to describe it. Wine appeals to the sight, to the smell and to the palate, but the varying shades of effect that different wines possess are innumerable and can only be described metaphorically, therefore vaguely. The appreciation of wine requires special education on the part of the consumer. The experienced eye will recognise at once the appearance that a good wine should have. Smell and taste are matters of much greater difficulty, and even experts are not generally agreed as to their terminology. The best quality should represent the best condition, flavour and aroma of a given wine from a given district.

Comparison of wines.

37. Wines from different districts have a definite quality of their own and it would be a great mistake to compare different kinds of wine. Australian and South African wines possess qualities of their own not necessarily identical with those of French wines, but they are real qualities, and people appreciate them in the same way as connoisseurs of European wines appreciate the different qualities of those wines. One great handicap to the Empire wines arises from the fact that the taste for wine in European countries is based on

the qualities of European wines to which people have become accustomed and simply because Empire wines possess certain different qualities they are often hastily and unjustly judged as inferior. This is a great mistake. In the historic wine-producing countries of Europe wines of widely different types are made, but no one would attempt to compare the quality of different kinds. The dry white wines of France, Germany, Spain and Italy are, for example, entirely different, but the competent judge of wine would compare only similar types of wine, whereas he could pronounce on the quality of each type. In order to introduce their wines into the United Kingdom market which had already developed tastes for certain types, wine makers of the Empire have concentrated on producing wines of those types. Thus, South Africa has made hocks and moselles, Australia has made burgundies, and both have made wines of port type. This has probably been responsible for comparisons that have been made between these Empire wines and the types which had already been popularised by European wine makers. Any general slavish imitation of the European types of wine would be undesirable and we suggest for the consideration of the wine makers of the Empire that they should continue to develop the natural qualities of their wines so that they may be appreciated for their own merits and not for the proximity with which they resemble wines grown in other parts of the world. Connoisseurs in England are ready to praise any wine for its particular quality. Their praise has great commercial value and already many wines produced in Empire countries overseas are favourably noted by them. They strongly commend natural qualities but as strongly condemn artificial imitation. Thus, Mr. H. Warner Allen, a recognised authority on wine, wrote in the Press on the 27th November, 1931, as follows :—

“ It is all the more pleasing to find that South Africa is now producing a sparkling wine which can be judged not in terms of champagne, but on its own merits. I tasted some of the first dry Dominion brought into this country and was agreeably surprised to find that it possessed a pleasant natural grape flavour which was peculiarly its own. It was the taste which soil and climate meant the wine to have, and as clean and characteristic—though, of course, quite different—as the aroma of a Vouvray or an Anjou wine of the Layon hills.”

* * * * *

“ Those of South Africa are referred to above ; no less pleasing to the palate are the wines of Australia, always remembering that they are not imitations of European wines, but possess an individual merit derived from the soil and climate in which they are grown and the skill with which they are made.”

38. All the various stages of growing the grapes and making them into wine affect its quality. Quality depends upon the time at which the grapes are picked, the weather and other conditions at the time of fermentation, maturation and treatment before bottling, the time

Requisites
for making
good quality
wine.

of bottling and the age of the wine in bottle. These factors depend on local conditions and their proper execution must be the result of close and careful study. It is a general rule that as regards wine, quantity can never be obtained except at the expense of quality. Rich soils in which common grapes grow freely and give big yields are not suitable for the grapes yielding the finer types of wine. The finest classes of grapes will grow on poor soil, but do not produce good quality wine when grown on rich soil. For example, some of the finest wines come from grapes grown on the banks of the Rhine, the Moselle, in the Burgundy district, on the chalk of Champagne, in the sand and gravel of the Médoc, and on the schist of the Douro Valley. On these soils nothing will grow properly except certain high-class grapes which do not give great yields of fruit but they give very fine wine.

Effect of
quality on
demand.

39. Connoisseurs, naturally, have very definite ideas on the qualities of wines, but the majority of consumers are not connoisseurs and their demand for wine is largely dependent upon price. Taxation, therefore, has very important effects in directing demand. In the great wine producing countries heavy duties are imposed on any imported wine with the result that demand is strongly in favour of the locally made product, and people who have become accustomed to the wines of their country demand them if they remove to other countries where they may often be dearer than other wines. Similarly, in English history demand has varied from time to time in favour of the wine which was least heavily taxed. Thus, after the Methuen treaty of 1703, when the wines of Portugal were admitted to England at a much lower rate of duty than the wines of other countries, port wine became the most popular wine in the country. If a market so gained is to be permanently held, it is essential that during the period in which a wine receives preferential tariff treatment, steps be taken so to improve and maintain quality that the wine retains its popularity even when the tariff advantage is removed. Port wine had the advantage of a large tariff preference in England from 1703 down to 1831, when the Methuen treaty expired. During the period, the quality of port was greatly improved. A wine of generally high quality was evolved and certain vintages were so treated and matured as to create a reputation for excellence. It was certainly helped by a hard drinking age when, according to a commentator, "after dinner even in the best society one-third of the gentlemen at least were always drunk" and when spirit drinking, except among the lowest classes, had not become general. To the quality of the wine, however, was due the fact that, when in 1831 the duties on all wines (except those from the Cape) were equalised and when, in 1860, sweet wines were more heavily taxed than others, port still retained its popularity in the United Kingdom market. The converse was the case with the Cape wines in the early years of the nineteenth century. These wines were admitted at a lower rate of duty than other wines and even when, in 1831, the

taxation on other wines was equalised at 5s. 6d. a gallon, the duty on Cape wine was only 2s. 9d. No effective steps seem, in those days, to have been taken to create a goodwill for those wines. In fact they were largely used for blending with other wines to be sold as cheap port or sherry. Thus, after Mr. Gladstone removed the preference on Cape wine the attraction for using them disappeared. No goodwill had been built up for them among the public and they vanished from the market "leaving hardly a trace behind." Thus, although imports of wine into the United Kingdom increased from 6 $\frac{3}{4}$ million gallons in 1859 to more than 17 $\frac{1}{4}$ million gallons in 1880, imports of Cape wine declined from 787 thousand gallons to 12 thousand gallons.

Imports of Wine into the United Kingdom.

	1859.	1880.
	Galls.	Galls.
Wine of all kinds.	6,775,992	17,385,496
From British South Africa	786,621	12,380

It is of interest to note that imports of wine from Australia increased from 2,478 gallons in 1859 to 24,152 gallons in 1880. To-day Empire wines once again enjoy a fiscal preference and we, therefore, very strongly urge upon the wine-producing countries of the Empire the necessity of maintaining the quality of the wines they send to the United Kingdom and of continuing to improve them so that a reputation and a taste for them may be built up. No enduring purpose can be served, and certainly no markets outside the United Kingdom can be obtained if the preference is used merely for disposing of the surplus wine of the Empire producers. It is essential to ensure that the wine marketed is the very best that it is possible to produce, and that, by its quality, it gains public favour.

40. Great efforts are being made in the wine-producing countries in the Empire overseas to improve the quality of their wines. This effort comes at a very appropriate moment. Since 1925, when in our first report we sketched out the duties of an Empire Marketing Board, the movement in the United Kingdom to use Empire produce has developed vigorously. To-day the determination—no milder word would do justice to it—among large sections of the population to try Empire produce is more pronounced than ever, but in order to translate into practice this latent good feeling towards Empire produce, three things are necessary:—

- “ (i) That the consumer should be induced to select Empire goods ;
- (ii) That he should be able to recognise Empire goods ; and
- (iii) That Empire goods should be adequate in supply and quality and reasonable in price.”

Of Empire wines, as a whole, it may be said with truth that they are now "adequate in supply and quality and reasonable in price." But a great responsibility rests on the producers to market wines of the best possible quality. Further improvement in quality would certainly increase trade, and the words are as true to-day as when we wrote them in 1925, that "the consumer, however well disposed to buy Imperially, cannot in the vast majority of cases afford to do so unless satisfied in regard to price and quality."

Education of
the consumer

41. In addition, Australian and South African wines are well marked and identifiable. One of the chief tasks for gaining a still wider market for them in the United Kingdom lies in the education of the consumer. Many consumers in the United Kingdom are prejudiced in favour of the types already made popular by foreign growers, and many who have no expert knowledge of wines, choose that with a foreign label either through fear of venturing on the unknown or as evidence of their supposed knowledge. This kind of prejudice is difficult to overcome. Merchants have informed us that they have persuaded hotels, restaurants and clubs to include Empire wines in their lists, but the results have been disappointing. Few select them of their own initiative, and wine stewards, when consulted, seldom draw the customers' attention to their merits.

42. We would like to see much greater prominence given to Empire wines, not only at public and official dinners, but also in clubs, at reunions of societies of old boys, of athletic clubs, of ex-service men and similar functions. The wines are worthy of such inclusion on their merits; and the familiarity which would result from their repeated appearance, at these functions, should go far to dispel the hesitancy of the individual host to order them for his guests. By this means the fact that wines of Empire origin worthy of serious consideration by the discriminating exist, would be brought to notice of many who have not, as yet, sampled them. But such "passive" propaganda would be powerfully reinforced, if those who knew and valued those wines, wrote about them, described them and in general "declared their faith" in them.

Aristocracy
of Empire
wines recom-
mended.

43. In this we believe the wine producers in the Empire overseas could actively help. Many of the dry wines in the Empire are excellent. Australian burgundies have secured a certain clientele, and they are now sufficiently good to improve by ageing. Some dry wines of the highest class, sold under estate or garden names, are produced in Australia and South Africa, but are mostly consumed locally. We strongly commend to the wine makers in the Empire the production and marketing of some wines of outstanding merit. We believe that if some such wines were sold in the United Kingdom—not necessarily in all classes of wine or in great quantity—the attention of connoisseurs would be forcibly attracted to Empire wines and other Empire wines would profit by the reflected glamour of these great products. All French dry wines are by

no means château wines, nor are all Portuguese wines vintage ports, but it is beyond all doubt that much of the popularity of French and Portuguese wines is directly attributable to the renown of these châteaux wines and vintage ports. The establishment of an aristocracy of Empire wines would be sure to bring in its train an increased demand for the more humble products. Time and continued endeavour would be required to produce and establish the fame of such outstanding wines, but, presumably, Empire growers are striving to found an enduring industry, and not merely to snatch fortuitous profits rendered possible by fiscal concessions. No wine industry which has endured but for a day or a brief span of years, has left any name. The market gardener can change his crops to meet market demand, the arable farmer can change to mixed farming, but the vine grower and wine maker must needs take a longer view. Tradition, history, even romance—all the result of time—cluster round his produce and enhance its value as the years go by. Whilst it is, therefore, true that he must sell his produce from year to year in order to live, yet he of all agriculturists should look farthest into the future. He, of all his fellow farmers, has the most to gain from long-established connections and goodwill.

44. Australian and South African sweet wines have, as we have shown, already obtained considerable popularity in the United Kingdom, and their consumption has increased since 1927 while the total consumption of wine has declined. The better Australian and South African wines are definitely superior in quality to the sweet red wines from Spain (Tarragona) and the cheaper kinds from Portugal. Considerable improvement in quality is, however, necessary before they can compete further with the better grades of those wines from Portugal which are marketed as vintage port. The Empire sweet wines have a distinct character of their own, and are generally more robust than similar types of European wines. They are carefully made, and legislation is strictly enforced that they are fortified with wine spirit only.

45. The conditions necessary for producing good wine vary greatly according to the locality. As a general rule wine making in Australia and South Africa is on a much larger scale than in the older producing countries. The holdings are much larger, the yield per acre is heavier and fermentation is carried out in big concrete tanks. Similar conditions prevail in Algeria, the wines from which country are largely consumed in France, and in Argentina. The yield per acre in the older wine-growing countries varies considerably according to locality and year. The following table, based on figures published by the International Institute of Agriculture, shows the yield per acre in some of the principal wine-growing countries in two different years. Details for Portugal and for the Union of South Africa are not available.

Yield of wine per acre.

Country.	1926.	1930.
	Gallons.	Gallons.
Algeria	362	498
Argentina	285	487 (1927)
Australia	449	350 (1929)
Bulgaria	241	312
France	248	267
Germany	121	352
Greece	211	173 (1929)
Italy	193	175
Roumania.. .. .	263	312

Owing to the more regular climate of Australia and South Africa the annual output is more constant than that in the cooler countries in Europe where more variable weather conditions prevail.

Maturation.

46. Maturation is an important factor in the production of good quality wines. Age, together with the constant attention necessary during the storage of the wine, produces certain changes in good wine which greatly enhance its quality. In the case of fortified wines ageing is particularly necessary so that the brandy added to the wine may gradually lose some of its strength and may "feed" upon some of the original grape sugar left in the wine. Wine will generally improve for a time, but is at its best when it reaches a certain age, after which it will deteriorate. The stock on which the grapes are grown has an effect on the age at which a wine is at its best. After the phylloxera scourge, most of the vineyards of the world were replanted with the old vines grafted on to American phylloxera-resistant stocks. The resulting wines retain most of the qualities of the wines produced from the older vines, but they generally mature rather earlier than formerly. Climate also has an effect on the maturing of wine, and generally the hotter the climate, the earlier a wine attains to maturity. Complaint is sometimes made that Empire wines as a rule are shipped too young, but both in Australia and South Africa steps have been taken to prevent the shipping of wines insufficiently matured. From South Africa wines less than eighteen months old may not be exported and the extension of the minimum age to two years is under consideration. In Australia the law provides that no wine under six months old may be exported, but further provides that only wines judged to be of sufficiently good quality may be exported, a provision which prevents wines being shipped too young. For the purpose of judging wines proposed for export, a Committee consisting of representatives of the Australian Customs Department and the manufacturers test all wines. In the case of sweet wines the Committee give the authority for exporting the wine and for the payment of export bounty. They pass no wine which shows any trace of

unsoundness or which is of poor quality, and also reject any wine which in their opinion would deteriorate during the long journey to the United Kingdom. In the case of dry wines, which are bought direct by firms in the United Kingdom through their representatives in Australia, the Committee subject them to similar examination in Australia before they are shipped. It would not be correct to say generally that if Australian wines were older they would be of better quality. We are satisfied that the question of maturation receives due consideration in Australia, but we are assured that considerable trouble would be experienced there if the age of wine exported were regulated by law, chiefly owing to the fact that the various soils and conditions in the wine producing areas cause considerable variations in the period necessary to bring the wines to the stage when their quality is at its best.

47. The "ageing" of wines involves expenditure in loss of interest ^{Ageing} on the capital involved in holding the wines in store and also directly from loss due to evaporation. In this respect the trade practice in regard to Empire and foreign wines differs widely. On the whole, in Empire countries, the grower or his co-operative society holds the wine until shipment, which usually takes place within two years of manufacture. The merchant in the United Kingdom may hold it for another two years, but rarely longer. In European wine-producing countries the duty of ageing and maturing wines always devolves upon the merchants operating in the country and not upon the growers. In Portugal, for instance, the first brisk fermentation of the "must" is carried out in the vineyards. The wine is then sold to shippers at Oporto who store it in lodges where fermentation goes on slowly for a very long time. The grower is paid at once for his wine and the shippers at Oporto stand the expense of maturing. Four classes of port are generally recognised, and all take many years to produce. Vintage port is generally shipped two years after the vintage. A vintage port may then be kept for ten years or more before it is bottled, when it is called a late vintage port. Tawny port is a blend of ports matured locally for several years in wood; and ruby port is usually a blend of wines of different vintages which retain their deep vintage colour. The keeping of the wine so as to produce these types of wine is very expensive. Evaporation, which averages 2½ per cent. per annum, rent, insurance, care, and interest on capital all add to the cost. It is obviously impossible for the growers to bear these charges. Sherry also takes several years to mature, but the cost of the bodegas in which it is matured and blended is not borne by the growers. In France, except in the case of a few of the large producers, the grower is paid at once for his wine and all the extra charges of maturing are borne by merchants. In South Africa, the Winegrowers' Association holds the stocks of wine and matures them before export so that the grower obtains his return at once for his wine. The Australian grower, in many cases, is also a merchant, and every winery has considerable storage capacity

to hold wines from two to three years or more. Most of them are proprietary and, except in a few instances, are not co-operative. The wine merchants in Australia who are not manufacturers, carry, for the most part, nothing but day to day stocks. Taking, therefore, the long view—and in seeking to establish a wine industry it is the long view which counts—there seems to be room for further organisation in the industry itself, whereby wines (or selected wines) are held for long periods. Except in special cases, this would appear to be beyond the resources of individual growers; and should more appropriately fall to the co-operative societies manufacturing the wines or to the merchants handling them.

United Kingdom a fastidious market.

48. At this stage we wish to impress upon the wine-producing countries of the Empire the fact, which has been noticeable in other commodities, that the United Kingdom is a fastidious market. Australian and South African sweet wines are already competing strongly with the cheaper Spanish and Portuguese sweet wines, but, if an attempt is to be made to make further headway in the United Kingdom market, care must be taken not to send any poor quality sweet wines to that market. Under the inducement of the bounty in Australia and of the fiscal preference some inferior Australian sweet wines were originally exported to the United Kingdom. In recent years greater care has been taken to export from Australia only wines that are judged to be of sound quality.

IX.—BLENDING AND MIXING.

Necessity for blending.

49. Blending is a principal part of the wine maker's art, and is an operation requiring considerable skill. It is necessary in order to maintain regularity of flavour and quality which otherwise would vary on account of the weather in different seasons. The practice is by no means confined to cheap or common sorts of wine. It is, for example, essential in the production of certain wines, such as tawny port, sherry and champagne. Blending is, however, resorted to for a number of quite different reasons. Some of the cheaper brands of tawny and ruby ports are not prepared in the manner described in paragraph 47, but are the result of blending young wines of different colours.

Blending to reduce duty payable.

50. Whilst these forms of blending are regarded as incidental to normal manufacture, there are other forms of blending to which exception was taken by several witnesses. The object of the blending in these cases is to take advantage of the existing differing rates of duty. Previous to 1927 the dividing line for purposes of duty was drawn at 30° strength. In those circumstances much of the port and of the sweet red wine imported was of strength 28° and 29°. In 1927 the dividing line was lowered to 25° so as to make such wines subject to a higher duty. Since 1927, a practice has increased of blending, after payment of duty, sweet red wine of high strength with cheaper Tarragonas or Lisbons of low strength, so as to obtain a blend comparable in strength and duty to Empire sweet wines admitted at preferential rates. Under the present system of duties

these results can be attained by mixing three parts of a lower strength wine to one part of the higher strength. The high strength wine used must clearly be as "strong" as possible. In practice it must not exceed 42° strength, for if above that strength an additional duty of eightpence per gallon becomes payable on each additional degree of strength. But by mixing three parts of wine of low alcoholic strength just below 25° subject to a duty of 3s. a gallon with one part of strength just under 42° subject to a duty of 8s. a gallon a mixture is obtained of about 29° strength on which the average duty paid is about 4s. 3d. a gallon.

51. The duty on Empire sweet wines of strength between 27° and 42° is 4s. a gallon and on foreign wines of similar strength 8s. a gallon. By the method explained in the preceding paragraph, a sweet wine of foreign origin is obtained on which the duty paid works out at 4s. 3d. a gallon. Those dealing in Empire wines complain with considerable justice that thereby the preference of 4s. a gallon granted to their product is almost completely nullified. It is impossible to state categorically the extent to which the practice is followed. It takes place after removal of the wine from bond. It is, however, generally stated in the trade that this sort of mixing has increased since the revision of duties in 1927. This view gains support from the increase since 1927 in the imports of red wines from Portugal and Spain of strength from 40° and to 42° inclusive. It would be unreasonable to ascribe all such increase to the development of this practice of mixing. Even before 1927 the imports from Portugal and Spain of these high strength wines were increasing, and some of this high strength wine is doubtless sold and consumed. But it is remarkable that whereas the average of total imports of red wine from Portugal and Spain in the years 1928-30 was 37.6% below the average of the three years 1924-26 the imports of wine of high alcoholic strength—40°, 41° and 42°—increased from an average of 199,000 gallons to 320,000 gallons or by over 50%. This change does support the idea that since 1927 a new use for these high strength wines has been found and Empire interests suspect that that new use lies in mixing with low strength low duty wines, to produce a blend on which the duty works out very similar to that imposed on Empire wines. This mixing of very high strength wines with those of low strength cannot be done to "improve" either, for witnesses are agreed that the blending of wines of such diverse strengths tends to destroy the particular attractions of the components. Details of the imports of red wine from Portugal and Spain of various strengths for the years 1925 to 1930 are given in Appendix V, Table B.

52. There is another form of blending very objectionable to those endeavouring to encourage the sale of Empire wines on their merits. Empire sweet wines as imported usually carry not more than 35° proof spirit. A practice has grown up of purchasing Empire sweet wines in bond and re-enforcing them with spirit to bring them to 40° strength, at which strength this fortified wine can still be cleared.

as "wine not exceeding 42°". As such it is liable to a duty of 4s. a gallon, the same as that of a straight Empire wine. The attraction of these mixtures lies in their alcoholic strength. It is possible that the sale of these high strength mixtures may create a demand which may ultimately do considerable injury to the reputation of Empire wines. The Royal Commission on Licensing presumably referred to this practice in paragraph 592 of their report. They there said that:—

"The distilling industry especially commented on the competition offered by certain so called wines. The beverages in question are wines to which spirit has been added in bond."

If the practice continues it may even tempt Empire producers to export over-fortified wines to the general detriment of the quality of their product. It is especially unfortunate that this type of competition has developed at a time when the Empire producer is paying increased attention to the quality of his product.

53. Whisky is sold retail 30° under proof, equivalent to 70° of spirit, and is usually diluted before being consumed. These strengthened wines are as near to 40° alcoholic strength as possible, and so contain more alcohol than the usual whisky and soda, or whisky and water. They also contain more alcohol than ordinary port; and the duty levied on the spirit used in fortifying them has in effect been only at a rate of 4s. a bulk gallon instead of 76s. 4d. a proof gallon. We feel, with the representatives of the wine trade and of the distillers, that this practice is an abuse of the customs regulations, fraught with unfortunate possibilities for Empire producers. It is bound to be only a matter of time before, by some means, it is stopped. We hope that that may take place before it becomes identified with any product of Empire origin. In this connection it should be noted that in the Finance Act, 1932, Section 11, the use of names for such wines fortified in bond as would indicate that they contain spirits or are substitutes for spirits, is prohibited.

54. The extent to which fortification of wines in bond has taken place in the four years 1928–31 is shown in the following table:—

Quantities of Empire and foreign wine imported into the United Kingdom, the quantities fortified in bond, and the percentage of the imports which are fortified.

Calendar Year.	Empire.			Foreign.			Total.		
	Imports.	Fortified in Bond.	Per cent. of Imports fortified in Bond.	Imports.	Fortified in Bond.	Per cent. of Imports fortified in Bond.	Imports.	Fortified in Bond.	Per cent. of Imports fortified in Bond.
	Thousand gallons.		Per cent.	Thousand gallons.		Per cent.	Thousand gallons.		Per cent.
1928	2,197	582	26.5	10,017	422	4.2	12,214	1,004	8.2
1929	2,718	627	23.0	11,149	488	4.4	13,867	1,115	8.0
1930	2,639	770	29.1	9,973	397	4.0	12,612	1,167	9.2
1931	3,237	822	25.0	10,816	422	3.9	14,113	1,244	8.8

X.—THE VITICULTURAL INDUSTRY IN AUSTRALIA.

55. The vine was introduced into Australia at the time of the early settlement in New South Wales and its cultivation spread to Victoria and South Australia which are now the chief states in which it is grown. The Australian vineyards suffered from outbreaks of phylloxera in the eighties of last century. The disease was eradicated by extensive uprooting of vineyards in infested areas and the prohibition of imports of any but phylloxera-resistant stocks. Practically every type of commercial grape is grown in Australia. While in many districts good dry wines are produced, the hot summer climate of Australia favours the formation of a high proportion of sugar in the grape, a condition specially suited for the production of wines of port type. This is particularly the case in South Australia where, in the season 1929–30, over 75 per cent. of the wine made in Australia was produced. ^{Early history.}

56. Until the close of the war the production of wine in Australia was comparatively steady at about five and a half million gallons a year. After the war, production expanded rapidly, exceeding 20 million gallons in the season 1926–27. Since that year production has declined. The following table shows the growth of production in the present century :— ^{Production in Australia.}

Australian Production of Wine.

Year (ended 30th June).	Wine Production.	Wine Consumed in Distilleries.
	Million gallons.	Million gallons.
1901–2 ..	5·8	Not reported.
— ..	—	
1909–10 ..	4·6	2·1
1910–11 ..	5·9	
1911–12 ..	5·0	
1912–13 ..	6·1	
1913–14 ..	4·7	
— ..	—	Not reported.
1918–19 ..	8·7	
1919–20 ..	7·6	6·5
1920–21 ..	11·0	
1921–22 ..	8·6	
1922–23 ..	11·4	
1923–24 ..	14·7	
1924–25 ..	13·3	
1925–26 ..	16·2	
1926–27 ..	20·5	
1927–28 ..	17·3	
1928–29 ..	18·6	
1929–30 (Estimated) ..	16·0	n.a.
		n.a.

No accurate statistics are available to show what proportion of the production consists of dry wines. Estimates vary between 4½ million and 9 million gallons.⁽¹⁾

Settlements
for Returned
Soldiers.

57. Before the war, and for three or four years after it, the bulk of Australian wine was a dry, robust wine of the burgundy type, popular in the United Kingdom in the flagon trade. The increased production of wine since the war has been primarily due to the efforts of the Australian Government to meet the needs of the soldiers returned from the European War. Many of these men had to find new work, many again no longer wished to work in the towns but wanted to settle on the land. Under various Settlement Schemes large numbers of demobilised soldiers were settled in the Murray Valley and in the Murrumbidgee Irrigation District, localities specially suited to the cultivation of grapes. On the Murray, the men were assisted to grow both grapes suitable for drying and the Doradillo variety of grapes for the manufacture of fortifying spirit, supplies of which were short. Competition between wine makers to obtain grapes for both wine and brandy making was strong, and prices rose, and reached as much as £18 a ton. The pre-war price was £7 a ton. Doradillo grapes for distilling were fetching £12-£14 a ton, whereas their pre-war price was £4 a ton. The price for these grapes in 1931 was £5 5s. a ton ⁽²⁾. Development proceeded faster than the market could absorb the produce, and a glut of Doradillo spirit resulted. Also, the demand for the dried grapes did not materialise, and the fruit was turned into white wine. A good sweet wine was produced. This solved part of the problem by absorbing some of the spirit and disposing of the grapes, but an annual production of some 2 million gallons of sweet fortified wine resulted, and outstripped the available market. In the Murrumbidgee Irrigation area, table grapes were out of the question and the Doradillo grape for dried fruit was being over-produced elsewhere. It was therefore decided to grow grapes for sweet wine. Here, also, the production of both sweet and dry wines increased rapidly and failed to find an immediate market. It is to the production in these two districts that the increase noted in paragraph 56 is mainly due. It is also clear from the account just given that this increase consisted in the main of a type of wine—sweet and generally light coloured—which had not previously been produced on a large scale in Australia.

Markets for
Australian
wines.

58. The Australian wine market is inelastic, and little could then be done to absorb locally any considerable proportion of this increased production. Markets overseas had to be sought. The only one offering any prospect was that in the United Kingdom. There, however, the wine trade was old-established, the consumers conservative if not actually prejudiced, and the channels of the wine trade

¹ Report of second reading of the Wine Export Bounty Bill, Debate of 30th April, 1930.

² Report on the Wine Industry of Australia, October, 1931, presented to the Parliament of the Commonwealth of Australia.

were organised to supply the market with foreign wines that had been known for centuries. Moreover, in that market the liquor trade was heavily taxed, and in 1927, shortly after the new wines came on the market, the duties were again greatly increased. Then, again, in 1929 began a period of great depression which is still having an adverse effect on the trade in wine which, in the United Kingdom, is generally regarded as a luxury. The time was certainly not propitious for building up a trade in a new wine. The product, however, received considerable fiscal advantages, partly from the substantial preference granted in 1927 to the wine from the Empire, and partly from bounties granted by the Australian Government on exports of sweet wine. The wine was appreciated in the United Kingdom on its own merits and as the preference and the bounty were reflected in the price, the trade in Australian wine is now firmly established. In fact, as we have shown, while the consumption of wine in the United Kingdom has been declining during the last three years, the consumption of Australian wine has been increasing.

59. For a wine producing country the consumption of wine in Australia is small. No exact information regarding it is available, but we are informed by the Department of Markets that a generally accepted estimate places it, under normal conditions, at 5 million gallons annually, or 6·26 pints per head of the population. Although higher than per caput consumption in the United Kingdom (2·8 pints) this is markedly less than in other wine producing countries, particularly those in Southern Europe (¹). It is also less than that in South Africa (15 pints). Practically the whole of the local consumption in Australia, probably 90 per cent., is sweet wine—a great deal of it consisting of the cheap grades consumed in industrial centres. There is very little variation in the consumption of wine in the different states on the mainland, even in the wine-growing areas. In Tasmania consumption is markedly less than elsewhere. A report on the wine industry of Australia by the Director of Development and an official of the Department of Trade and Customs was published in October, 1931(²). In the report, which deals with all aspects of the industry, important recommendations are made with a view to increasing the consumption of locally-produced wines in Australia. Methods of marketing wine in the local market are described as haphazard, and co-operation between wine-makers and distributors is recommended so as to take advantage of the methods of distribution provided by the licensing laws of the various States. Profits on wine sold locally are also stated to be so high as to restrict consumption. It is clear that any steps which may be taken to increase the consumption in Australia, especially of the dry wines, consumption of which in the United Kingdom is declining, would considerably help the Australian wine industry. Australian wines locally consumed are generally described by the names long prevalent in England for the different

Consumption
of wine in
Australia.

¹ See paragraph 22.

² Report on the Wine Industry of Australia—No. 278. October, 1931.

kinds of wine such as port, sherry, burgundy, claret, chablis. An attempt made some years ago to popularise the use of special names for Australian wines was unsuccessful. Wines from various vineyards are usually blended by the merchants and the names of Australian vineyards are very rarely used. One or two districts are generally considered to produce special types of wine, but producers do not get higher prices for their wines than those in other districts. Little importance is attached by buyers to the year in which any particular wine was produced.

Customs and excise duties in Australia.

60. Wines imported into Australia are subject to very high customs duties. While there is no excise on the locally produced wines, on Australian-made brandy an excise duty of 28s. a proof gallon is levied if the brandy is bottled under Customs or Excise supervision and 33s. if not so bottled. Imported brandy and liqueurs are subject to customs duties ranging, according to alcoholic strength, from 45s. to 47s. per proof gallon.

Stocks of Australian wine.

61. Stocks of wine held in Australia on 30th June, 1925, were estimated at 14,773,000 gallons. At the 30th December, 1930, stocks were estimated to be 15,482,693 gallons. The average annual surplus of Australian beverage wine for the five years ended 30th June, 1930, is estimated as follows:—

	<i>Gallons.</i>
Average annual production	17,700,000
Liquid quantity of fortifying spirit	957,000
	<hr/>
Total	18,657,000
From which must be deducted:—	
Quantity used for distillation	10,441,750
Estimated local consumption	5,000,000
Average annual exports	2,500,000
Evaporation and other losses	400,000
	<hr/>
Total	18,341,750
	<hr/>

leaving an average annual surplus of 315,250 gallons.

Export Bounty.

62. Although local stocks of wine in 1931 were comparable with those seven years before, this result was only achieved by the adoption of special measures encouraging export. Since 1924, bounties—the rates of which have been altered from time to time—have been given on exports of fortified sweet wines. When first introduced on the 1st September, 1924, the rate was fixed at 4s. a gallon, but no drawback was allowed for the excise duty on the spirit used for fortification. At that time this worked out at 1s. 3d. a gallon of wine, and consequently the effective bounty was 2s. 9d. a gallon. Ever since its introduction, this bounty, or the rate at

which it should be given, has been a subject of discussion. The rate was altered in 1927, again in 1928, and again in 1930, after the cessation of the bounty had been threatened.

Changes in Bounty between 1924 and 1928.

Year.	Bounty.	Drawback.	Effective Bounty.
	<i>s. d.</i>		<i>s. d.</i>
1924	4 0	No allowance for excise on spirit used ..	2 9
1927	1 9	Drawback allowed for excise paid on spirit	1 9
1928	1 0		1 0

The bounty greatly stimulated exports of sweet wines, as is clear from the following table:—

Australian Exports of Sweet Wine and Bounty Paid.

Year ended 30th June.	Exports (gallons).	Bounty Paid £
1925	142,085	28,417
1926	1,085,540	217,109
1927	2,212,050	442,410
1928	3,215,612	482,843
1929	1,261,712	76,454
1930	1,542,707	79,965
Eleven months to 31st May, 1931 ..	1,710,964	148,615

Most of the exceptional exports in 1928 took place before the reduction in the bounty in that year became effective and were accelerated by the fact that notice of such reduction had already been given.

63. Under the Wine Export Bounty Act, 1924–1928, the bounty on fortified sweet wine was due to cease on the 31st August, 1930, but, on representations from the Federal Viticultural Council of Australia, the Wine Export Bounty Act of 1930 was passed. This act restored the bounty to 1s. 9d. a gallon, and is to operate up to the 28th February, 1935. Two conditions were attached to the bounty:—

- (1) The price of grapes to be paid by the wine manufacturer to the grower was to be fixed by the Minister for Customs, and
- (2) The excise on fortifying spirit was raised from 5s. a gallon (Doradillo) and 6s. a gallon (other kinds) to 10s. and 11s. a gallon respectively. This increase in the excise was to provide the money required for the increased bounty and, if any surplus accrued, it was to be carried to a special Trust Fund which was to be earmarked for the "encouragement of the exports of wine."

As a result of the Emergency Economy Act, which affected all expenditure by the Commonwealth Government, the bounty was reduced by 20 per cent. from the 20th July, 1931. The present rate of bounty is therefore fixed at 1s. 5d. It must be noticed that the bounty is payable only on wine which can be shown to have been produced from vineyards planted on or before the 31st March, 1928 or, in the case of an irrigation area planted with vines with the assistance of the Government of a State, before the date of the 1930 Act—that is, before the 5th June, 1930. In other words, the fiscal aid given by the 1930 Act was not to be used to extend the area already under vines.

Effect on
United
Kingdom
market.

64. The bulk of the increased production of wine was exported to the United Kingdom. That market was faced for three years with a supply of sweet wine increasing annually by a million gallons. Speculators who knew little or nothing about wine entered the trade and were ignorant of the care necessary for a wine that has travelled the long journey from Australia. Withdrawals from bond of Australian wine in the United Kingdom greatly increased during the period 1925 to 1930, except in the one year ended 31st March, 1927. They did not, however, increase to the extent of absorbing the enormous export from Australia from 1st July, 1927, to 30th June, 1928, of 3,215,612 gallons, with the result that much of the wine was left on the hands of the importers. The following table shows how the consumption of Australian wine in the United Kingdom increased during this period of rapid growth of the Australian industry and rapid development of the export trade stimulated by the export bounty.

Australian Wine retained for home consumption in the United Kingdom: Year ended 31st March.

Description.	1925.	1926.	1927.	1928.	1929.	1930.
	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.
At lower rate of duty ..	607,762	507,867	541,811	573,234	470,161	511,126
At higher rate of duty ¹ ..	4,914	382,522	1,061,252	1,719,774	1,721,051	1,922,433
Sparkling wines	1,978	616	507	241	256	1,439
	614,654	891,005	1,603,570	2,293,249	2,191,468	2,434,998

¹ The wine on which bounty was paid.

Other
markets for
Australian
wine.

65. Apart from the United Kingdom, to which over 90 per cent. of Australian exports of wine have been consigned, a small proportion has been exported to New Zealand and other Empire countries. Under the treaty between Australia and Canada in 1931, Australian wines will receive tariff preference in Canada and a gradual expansion of sales of Australian wine in that market is expected.

66. Further, in order to supervise the general quality of the ^{Australian} wine exported from year to year, to secure power to control, in ^{Wine} case of need, the offerings for export of Australian wines and ^{Marketing} Board. generally to further the export trade, the wine industry of Australia, under the provisions of the Australian Wine Overseas Marketing Act, 1929, was given the option, to be exercised by a poll, of setting up a Board to watch and regulate the export of wine. For the poll, all producers of wine who converted more than 500 tons of grapes into wine, were given one vote. As the result of the poll, the Australian Wine Marketing Board was set up in 1929. Members of the Board are elected biennially. Provision was made in the Act that, after the Board has been in existence for three years, the Minister of Markets, on receipt of a petition signed by a majority of the wine-makers, may direct that another ballot be taken as to whether the Board should be continued. The first three years of the existence of the Board expires in June, 1932. In addition to exercising advisory functions, the Board, through its power of licensing all exports, is able to insist on the maintenance of the quality of the wine exported, to fix a minimum price for sales, and to collect such trade and statistical information as it requires. A London representative appointed by the Board began work in October, 1930. The aims of the Board are not in any way to interfere with the usual channels of the wine trade in the United Kingdom, but to assist that trade by friendly co-operation.

67. The Australian Wine Overseas Marketing Board has decided ^{London} that the London price of Australian sweet wine is to change auto- ^{price of} matically with variations in the rate of exchange between Australia ^{Australian} and the United Kingdom. The London price in June, 1932, was ^{sweet wine.} 3s. 6½d. a gallon. The price in bond of Australian sweet wine to the general trade has fallen from 5s. 6d. in 1926 to 3s. 6½d. in 1932. In most cases this fall in price has not been passed on to the ultimate consumer. Part of the fall in price is due to competition between individual wine makers or their representatives owing to the lack of organised marketing. A further factor in the reduction of price is the rate of exchange. This advantage of the exchange premium has been passed on to the buyer, a fact which will present difficulties when the exchange returns to normal.¹ The fall in price of Australian wine, while of no advantage to the Australian producers, may be found to be a handicap to increasing the sale of South African wines in the United Kingdom.

68. The quantity of Australian wine held in bond in the United ^{Restriction:} Kingdom at the end of December, 1931, amounted to 1,502,000 ^{on shipping} gallons and shipments in transit were estimated at 750,000 gallons. ^{of Australian} wine. Further considerable shipments of Australian wine usually occur in January. Therefore, in order to prevent the building up of unduly

¹ Report on the Australian Wine Industry. No. 268, October, 1931.

high stocks in the United Kingdom, restrictions on shipping were enforced on the recommendation of the Wine Overseas Marketing Board from 31st January, 1932.

Fortifying spirit.

69. In Australia, as in South Africa, fortifying spirit can only be made legally by the distillation of grape wine. The production during the five years ending 1929-30 with the approximate quantities used for fortifying wines and for sale as brandy are :—

Distillation of Wine in Australia.

Year.	For Fortifying Wine.	For Brandy.	Total.
	Proof gallons.	Proof gallons.	Proof gallons.
1925-26 ..	1,518,221	329,665	1,847,886
1926-27 ..	1,856,648	299,343	2,155,991
1927-28 ..	1,681,378	360,649	2,042,027
1928-29 ..	1,213,241	423,381	1,636,622
1929-30 ..	1,387,443	576,006	1,963,449

The figures given above for brandy for sale are not strictly correct for it is reported that some of the brandy so shown is diverted for fortifying wines.

Brandy is usually distilled at a low strength and fortifying spirit at a high strength. The quantities of Australian brandy cleared for local consumption during the last five years have been :—

1925-26	227,655 proof gallons.
1926-27	234,939 " "
1927-28	232,041 " "
1928-29	227,587 " "
1929-30	216,348 " "

which figures are well below those in column 3 of the preceding table. It is estimated that there were 1,500,000 proof gallons of Australian brandy in stock on 30th June, 1931.

XI.—THE VITICULTURAL INDUSTRY IN SOUTH AFRICA.

Early history and present position.

70. Vines were taken to South Africa by Johann van Riebeck in 1653. So suitable for the cultivation of the vine were the soil and climate of South Africa that, by 1687 half a million vines were established, the wine being locally consumed. Huguenot refugees in 1688 gave a further impetus to wine making and the production of wine gradually increased until in 1800 it reached 1½ million gallons. The Constantia wines from South Africa became known in many parts of the world. Owing to the Napoleonic wars, heavy duties were imposed on French wines in the United Kingdom and substantial tariff preference was given to South African wines. In the twenty years from 1820 to 1839 exports of South African wines

grew until they reached 564,020 gallons whilst the exports from France to the United Kingdom declined to 293,085 gallons. The Cape Government did a great deal to encourage the industry. In 1861, however, the preferential tariffs were removed and the export trade of wine to the United Kingdom fell away. In 1907 exports amounted to only 21,000 gallons. Although the cost added to South African wines by the distance they had to travel was a handicap when the tariff preference was removed, it is also probable that the loss of the United Kingdom market was to no little degree due to the fact that the trade had been built up on price rather than quality. Much of the Cape wine had, in fact, been used for blending with British made wines and sold as cheap port and sherry (see paragraph 39). The South African wine industry in common with those of nearly all the rest of the world suffered severely from the phylloxera scourge which broke out in 1885 and lasted for several years. In common with the other vine growing countries, local vines were grafted on to American phylloxera-resistant stocks. At the same time in some instances improved methods of manufacture were also introduced and gradually wines of a higher quality were produced. Owing to the low prices of wine realised in 1916 and 1917 the wine farmers combined into a co-operative association which succeeded at first not only in improving the price, but also, through its experts, in improving the quality. An exceptionally large vintage in 1921 brought about a surplus of wine with a consequent rapid decline in prices and the producers broke away from the co-operative association. The industry suffered severely and, in 1924, legislation was enacted to compel wine farmers to sell their distilling wine through the co-operative association, which was given a monopoly for the manufacture of brandy.

71. The Co-operative Wine Growers' Association of South Africa, Limited, thus was given legal powers. The Association relieved the market by destroying some of the wine it obtained and through its control of the manufacture of spirit it secured a grip of the export trade in sweet fortified wines. While securing to the farmers a reasonable price for their grapes, it has been able to build up financial reserves which have been utilised to improve the industry as regards both the quality of the wine produced and the organisation of the trade. The Association holds warehouse accommodation for six million gallons of brandy, and it has about a million and a-half gallons of brandy in stock three years old. Only three-year old brandy is used for fortification of its wines and much of the wine is held for periods exceeding the legal minimum of two years. In addition, in order to keep up the cultivation of raisins without unduly increasing the production of wine, it has been able to pay a bounty on raisins exported from the Union.

72. The export trade in wine of the Union of South Africa was restarted on a considerable scale when, in 1919 a preference of 6d. a gallon on Empire light wine was given in the United Kingdom.

In 1927, the United Kingdom Government increased the preference on dry wine to 1s. a gallon and gave a preference of 4s. a gallon upon sweet wines. The first shipment of sweet wines—in 1928—from South Africa to the United Kingdom amounted to 60 hogsheads (3,420 gallons) and the total shipments for 1928 totalled 268 hogsheads (15,787 gallons). These wines met with immediate success and, as we have shown, exports of sweet wine from the Union to the United Kingdom in 1930 reached practically half a million gallons. We are informed that dry wine is generally shipped at an average strength of 22° and sweet wine at from 36° to 41°.

Increased production and trade.

73. The great development in the activities of the Wine Growers' Association has occurred since the passing of the Wine and Spirit Control Act in 1924. The following table shews the increase in production from 1928 to 1930.

South African Production.

Vintage.	Fortified Wines.	Natural Wines.	Wines for Distillation.	Total.
	Gallons.	Gallons.	Gallons.	Gallons.
1928 ..	1,024,636	4,406,773	8,043,418	14,111,351
1929 ..	1,035,304	2,940,558	9,978,882	14,474,571
1930 ..	1,124,712	3,043,428	11,734,800	20,266,787

The bulk of South African wine is produced in Cape Province. Small quantities are also made in Natal, Orange Free State and Transvaal. The following table shews the growth of exports of wine and the stocks of wine held each year since 1926 :—

South African Exports and Stocks of Wine.

Year.	Exports.	Stocks at 31st December. ¹	
		Current Vintage.	Previous Vintage.
	Thous. gallons.	Thous. gallons.	Thous. gallons.
1926	169	2,878	1,847
1927	380	3,831	1,090
1928	358	3,894	1,651
1929	575	4,030	2,544
1930	646	4,002	2,947
1931	899	n. a.	n. a.

¹ Stocks held by wholesale wine and spirit merchants which they are required to report to the Commissioner of Excise and in control or possession of the merchants.

74. In addition to the wine produced, large quantities of fortifying spirit and brandy are made in the Union. The following table shows the production of brandy, the stocks held and the quantity consumed locally.

Fortifying spirit and brandy.

Wine Brandy.

Year.	Production.		Stocked on 31st December.	Consumption.
	Ordinary Commercial Brandy.	Pot Still Brandy.		
	(Thousands of proof gallons.)			
1925 ..	1,458	318	2,111	928
1926 ..	1,308	430	1,972	968
1927 ..	1,460	318	1,854	941
1928 ..	1,852	411	2,163	955
1929 ..	2,239	347	2,805	891
1930 ..	2,461	233	2,449	842

An excise duty is levied in South Africa on all brandy. The rate for pure wine brandy is 12s. 6d. a proof gallon. On brandy produced from the distillation of husks and wine mixed, which is known as grape brandy, the excise is 17s. 6d. a proof gallon. A discriminating excise of 22s. 6d. has practically stopped the manufacture of Dop brandy, which is distilled from the husks together with wine or piquette.

75. In the Union of South Africa there is no control of the method of wine making, or of the quantities of different wines which may be produced, neither is there any restriction as to which wines may be put on the local market, except that sweet wines must be fortified up to 30° proof spirit. This provision is designed to discourage the sale of sweet wine of low alcoholic strength to which preservative has been added. Wine containing 30° spirit needs no preservative. A custom has, however, arisen by which the merchants place their orders for the wine which the grower can produce, before the actual vintage and often at a definite price. In this way the merchants do to a certain extent control the class of wine that is made. The price of wine made for distilling purposes is controlled by the Co-operative Wine Growers' Association. With regard to brandy, the class of brandy distilled is controlled by legislation. The different classes of brandy are defined by law and to avoid wrong classification a Brandy Board nominated by the Government has been established. In the first place a sample of any wine to be distilled into brandy for maturing must be submitted to the Board who decide whether a brandy of the desired quality can be distilled from it. Further, before any brandy can be classed for excise duty, a sample must be

Control of brandy in distillation.

submitted to the Brandy Board who, even if all the regulations have been complied with, have power to reject any brandy which, in their opinion, is not up to the required standard due to careless distillation or any other reason. When the Board has passed a brandy as of good quality it may be matured for three years when a rebate of excise duty of 3s. a proof gallon is allowed. The method and time of maturation is prescribed by legal regulation. The brandy must be stored in wood in a warehouse both of which have been approved by the Brandy Board and remain under Excise supervision. It must be so stored for three years, at the end of which period it can only be sold or used after certification by the Board as being potable spirit. The brandy exported from the Union of South Africa is at least three years old, as usually required by most importing countries. For local consumption the law only requires that it shall be a blend containing at least 25 per cent. of three year old matured brandy.

Accommoda-
tion for
storing and
maturing.

76. The Co-operative Wine Growers' Association has selected Paarl as its base for wine export operations. Accommodation has been built there for over three million gallons of wine, of which one million can be stored in vats, one million in pipes and hogsheads, and one million in cement tanks. At the other wineries and distilleries there is accommodation for another three and a half million gallons of wine or spirit.

Endeavour
to open up
markets.

77. Owing to the small local demand for wine in South Africa compared with that in other wine making countries, the producers are compelled to seek markets overseas. Before attempting to open up oversea markets efforts have first been made to have a stock of high class wines fully matured and of such quality as to compete with the wines of other countries. Some years have been necessary to build up and mature these stocks and it is only recently therefore that attempts have been made to find a footing in the world's markets. The Co-operative Wine Growers' Association has sent deputations to various countries to endeavour to open up markets. In 1930, 5 per cent. of the total exports were marketed in foreign countries and 95 per cent. within the Empire (see paragraph 14). One of the chief difficulties met with in opening up markets in Europe is the burden of freights. The freight from South Africa to Europe in the summer of 1931 was altered to 62s. 6d. a ton of 2,240 lbs. which producers considered heavy, especially as the price of wine for export had been recently reduced owing to adverse times.

Expansion
of export
trade.

78. Although exports of wine from the Union of South Africa to the United Kingdom have grown very rapidly, and in 1931 reached 823 thousand gallons, it will be seen that this amount of wine is only about 4 per cent. of the total wine produced in the Union. The export trade is thus only beginning, and it will have to expand considerably if wine makers are to sell their produce.

No official figures of consumption of wine in the Union are available, but in general, merchants agree that it is steadily declining. Since 1920, South African dry wines have been imported into the United Kingdom, and efforts have been made to market them in direct competition with French and German wines. The imports of South African dry wines are in the hands of very few importers. Although the trade has greatly expanded in the ten years of its existence, it is capable of much further development as consumers become familiar with the wines of South Africa.

79. South African sweet wines, however, present a more difficult problem. Parts of the country—notably in the western areas of the Cape Province—are very well suited to the production of sweet wines. In the Co-operative Winegrowers' Association the makers of sweet wines already possess a marketing organisation which controls not only the production of sweet wines in South Africa but also their sale in the United Kingdom through accredited representatives. Thus the facilities for production and the machinery for marketing exist. The difficulty centres round finding markets—already three million gallons are in store in the Union. The wine enjoys a fiscal advantage in the United Kingdom under preference, but in that market it has to meet strong competition not only from the established Portuguese and Spanish sweet wines, but also from Australian sweet wines and the wines of similar character made in the United Kingdom from imported must.

80. Both Australia and South Africa depend on an export trade for the well-being of their viticultural industry, but marked differences exist in the methods by which the two Dominions have tackled the problem of the export trade. In Australia the export trade was built up, as we have shown, by granting a bounty on all fortified wine exported, providing it attains the standard of quality decided by an Export Committee. A minimum strength of 34° was fixed by law, and only pure grape spirit could be used for fortifying the wine. Otherwise the merchants have been free to export fortified wine in whatever quantity they chose. In South Africa, however, no bounty has been given on exported wine, exports of fortified wine have been controlled by the Co-operative Winegrowers' Association, and as the Association has arranged to export only to certain agents it has maintained a virtual control of the marketing of the wine in the United Kingdom. In addition to the requirement that wines must be fortified with pure grape spirit, regulations exist that fortified wines exported must be at least sixteen months old, and the Association has provided the capital and the accommodation necessary for storing and caring for the wine during maturation. It has taken several years to build up stocks of good quality wines. Great care has been taken in both Dominions to export only good quality wines. Although production of wine in Australia and in South Africa is practically the same amount, two million gallons of fortified wine from Australia

are annually imported into the United Kingdom, and at present only half a million gallons from South Africa. A large number of wine firms in the United Kingdom deal in Australian wines. They are thus advertised rather more widely than South African wines, which are concentrated in few hands.

Possibility
of producing
an Empire
sherry.

81. Two recommendations emerge from our enquiry into the wine industries of Australia and South Africa. First that wine makers in those Dominions should give careful consideration to the possibility of producing a good quality sherry-type wine and, secondly, that they should attempt to market some of their natural sweet white wines. Sherry has been a popular type of wine in the United Kingdom for many years, and in recent years it has considerably increased in popularity, rivalling to a marked extent the cocktail as an appetiser. It should be possible to make a good sherry in the Empire. It is not a difficult wine to make, as it is a blended wine, which makes it easier for the shipper to keep up the average quality. Many of the wines grown in the Dominions have something of the quality of sherry, and there appears to be an opportunity for wine growers in the Dominions to produce and export a good quality sherry. No hurried attempts should, however, be made to market an Empire sherry in the United Kingdom until a really good-class wine has been developed. The chief difficulty is the question of storing and maturing the wine. A new sherry only nine or twelve months old is very unpalatable. In Spain, sherry is made of wines of a number of years and of vineyards in different parts all blended together, carefully watched and matured. The Dominions could produce a very good sherry if they had the patience and the capital to wait for the blend of sherry type wines to become properly blended into one harmonious whole. In addition to sherry, natural sweet wines are also becoming increasingly popular in the United Kingdom. Sauternes is the best-known European wine of this kind. Sauternes is made from fully ripe grapes so that it is naturally somewhat sweet and of a clear amber colour. The abundant sunshine in South Africa and Australia tends to make their natural white wines sweeter and deeper in colour than many of the white wines of colder and less sunny regions. Advantage should be taken of this extra sunshine and an attempt be made to popularise the natural wine of a very rich golden colour, which in itself is beautiful. It is merely a matter of education to get the consumer to appreciate this rich colour. Attempts to take away this colour by artificial means so as to produce a "paper-white" wine seem to us to be misdirected.

XII.—WOOD FOR WINE STORING AND TRANSPORT.

Wood
imported
into
Australia.

82. Considerable difficulty is met in the wine trade in Australia owing to the shortage of locally-grown wood suitable for making barrels and casks. Oak for these purposes is imported from the United States and manufactured into casks in Australia. Such

casks cost from 54s. to 65s. each according to conditions in the coopering trade. A hogshead is approximately 65 gallons, so that the cost of the wood may be from 10*d.* to 1s. a gallon, which has to be charged to the purchaser in the United Kingdom. Some casks are shipped back again to Australia for further use, but the freight, although recently reduced from 75s. to 45s. a cubic ton, is expensive. Returning the casks in shook is not at present practicable as, owing to the changes in temperature on the journey, the wood develops a mould. The return of whole casks costs about £1 for a hogshead, and is a saving of cost, but there have been difficulties with the coopers' unions in Australia who do not encourage the return of whole casks. Casks in which whisky has been imported to Australia are greatly in demand for transport of wine, but the supply is insufficient. Oak is the most suitable wood for holding wine. Supplies of oak are, however, not available in sufficient quantity in the British Empire for the purpose.

83. It is usually considered that many of the hardwoods of Australia and New Zealand are not suitable for casks as they impart a flavour to the wine. However, in describing the woods suitable for port wine in Portugal, Mr. Geoffrey M. Tait¹ places first the Baltic oak, known as Memel or Stettin, then Adriatic oak, known as Trieste and Fiume, and adds :—"Next in quality comes New Orleans oak, but eucalyptus, although less known and more difficult to procure, is probably not inferior provided it is carefully chosen and very well seasoned. It is quite erroneous to imagine that this wood has any taste or smell of eucalyptus oil, and it has been proved that it gives less taste to wine than New Orleans oak."

It will be observed that this authority lays great stress on the need for the wood to be very well seasoned. He states that a new cask is seasoned with steam and ammonia, after which it is washed with water and seasoned with a young wine. The longer the process of seasoning with wine the better, as even after some years, the wood imparts its particular flavour to the contents of the cask. It seems desirable that further investigation should be made into the suitability, after due seasoning, of Australian hardwoods, for use in maturing Australian wine. The Department of Scientific and Industrial Research, London, has furnished us with a note on the available information on the subject of Empire timbers which may be suitable for making wine casks. This note is printed as Appendix XI to this report. The Department reports that Tasmanian oak, blackwood and mountain ash are said to be suitable for beer casks, but that they have no information as to their uses for wine.

84. The difficulty in South Africa is possibly still greater. Casks have to be imported empty or in shooks, as local supplies of suitable wood are not available.

¹ "Practical Handbook on Port Wine," by Geoffrey M. Tait.

XIII. OTHER EMPIRE WINE GROWING COUNTRIES.

Three
producing
countries.

85. The other countries of the Empire which produce wine and have an exportable surplus are Cyprus, Canada, Palestine and Malta. As we have shown in paragraph 10, the production in these four countries together (10 million gallons) amounts to little more than half the production in either South Africa or Australia. Great attention is, however, being given to the increase of output and the improvement of quality. In Canada the bulk of the wine produced is consumed locally. In Palestine consumption of wine is small and the industry depends on its exports. Cyprus, on the other hand, finds large markets close to the island in Egypt, Greece and the islands of the Ægean Sea. There is also a very considerable local demand. The produce of Malta is entirely consumed locally and imports are considerable.

CYPRUS

86. The wine industry of Cyprus is of great antiquity and the wines of the island were often referred to by the ancient Greek authors. In the middle ages the wine known as Commandaria, produced in the Commandery of the Knights Hospitallers, became famous throughout Europe during the Venetian occupation of the island. Commandaria is a sweet potent wine resembling port, prepared from half-dried grapes. It is still made in Cyprus and has a steady though restricted demand both inside and outside the island. Dry wines, both red and white, a sweet fortified wine of port type, brandy, unfermented grape juice and vinegar are also made in Cyprus. The dry wines of Cyprus are considerably stronger than those of France, and, though not fortified, both red and white dry wines are heavy. For a great many years wines were made in Cyprus with very little improvement until a few years before the war an English company erected a factory there and produced a creditable port type wine. The company gave up business in Cyprus just before the war, and it was not until 1925 or 1926 that the wine industry gave any signs of real activity. About that time a local company which had purchased the buildings and machinery of the English company started to make better wines with more or less French methods. Certain British wine firms became interested in Cyprus wines after the introduction of the preferential tariff in 1927, and in spite of local difficulties, succeeded in fusing their interests with those of local producers and launching the British Cyprus Company. In 1928, a law was enacted in Cyprus prohibiting the export of wine to the United Kingdom and other British countries unless it reached a standard which would enable it to compete in the British markets. The British Cyprus Company has practically the control of the wines exported to the United Kingdom. They began operations only with the vintage of 1928, and although a considerable quantity of wine is exported to the United Kingdom it is not sold there under the name of origin. It is rightly realised that unless the wine exported is of sufficiently high quality to compete with other wines in the market, harm may

be done to the reputation of Cyprus wines in general. A Committee composed of an officer of the Customs and Excise, the Government wine expert, and an expert nominated by the person who applies for a license to export, is appointed to decide whether the quality admits of the grant of a license to export to the United Kingdom. Thus the would-be exporter is safeguarded. The improvements that have already taken place are sufficient to justify the impression that improvements will continue and that quite soon the wine may be placed on the United Kingdom market under the name of the country of origin. Cyprus has always been free from phylloxera so that special legislation has been necessary to restrict imports of vines to ensure that they come from phylloxera-free districts.

87. According to statistics published by the International Institute of Agriculture, the production of wine in Cyprus amounts to some 4,900,000 gallons a year, and of spirit half a million gallons. Egypt is the principal destination for Cyprus wines exported, but up to 1929 considerable quantities were consigned to France. Brandy is exported in considerable quantities and increasing quantities of unfermented grape juice are also being exported to the United Kingdom. The following table shows the exports of wine, brandy and grape juice in 1930 and the chief countries of consignment.

Exports of Cyprus, 1930.

	Total.	Countries of Consignment.
	Thous. Galls.	Thous. Galls.
Wine : Commandaria	10	United Kingdom (5·7), Egypt (3·8).
Other.. ..	1,363	Egypt (1,157), United Kingdom (81), Italian Islands in Egean (42), Syria (36), Malta (29), Canada (10), Sudan (2).
Grape Juice (Must) ..	65 (1929)	United Kingdom (65).
	Galls.	Galls.
Brandy	486	Egypt (244), Italian Islands in Egean (101), Syria (56), Sudan (22), Palestine (14), France (10).

The French market for Cyprus wines dropped from 282,394 gallons in 1929 to 350 gallons in 1930, but the market in Egypt, in spite of an increased tariff, rose by 100,000 gallons. Exports of the better standards of wine to the United Kingdom have shown a remarkable increase.

Exports of Cyprus wine to the United Kingdom :

Year.	Gallons.
1929	44,575
1930	87,192
1931	156,666

88. The production of grapes in 1931 was considerably below the average in quantity owing to unfavourable weather which encouraged pests and diseases. Prices of wine have risen since the middle of the year and the prospects for the wine industry are considered very favourable. As we have shown, exports of the better standards to the United Kingdom have greatly increased, and it is reported that large orders have already been given for 1932.

CANADA

89. The Canadian wine industry is based on a different type of vine from that grown in other countries. The historic vine of Europe and the countries into which European vines were introduced is the *vitis vinifera*, but attempts to grow this species in North America have been unsuccessful owing to phylloxera, mildew, rot, and other diseases to which the native varieties are more or less immune. The native North American vine is the *vitis labrusca*, varieties of which are grown in all the vineyards except in California where the *vitis vinifera* is the commercial vine. Some attempts have been made to produce hybrids by crossing the two species¹ but except in California, North American vine growing depends on varieties of the *labrusca*. Vine culture in Ontario is comparatively recent, the first official record being in 1857. The first stimulus to the industry was given in 1882, when the "Niagara" variety was introduced. The main variety now grown for wine making is the "Concord," which originated in Concord, Massachusetts, from the seed of wild grape planted in 1843. The bulk of the grapes grown in Ontario are used for wine-making and in that province about 99.5 per cent. of the wine produced in Canada is made. The growth of the industry is shown by the following table:—

Year.	Acres under Vines.		
1880	400
1890	2,400
1901	5,750
1921	7,000 (estimated)
1927	8,000 (..)

90. Practically all the wine made in Canada is manufactured in the Province of Ontario. In addition to the produce of the vineyards imported materials such as dried raisins, currants, grape juice, sugar and honey are also used in the manufacture of wine. The quantity of wine made in 1930 was 5,718,354 gallons. With the increase in the acreage under grapes and with the increase in population in Canada the production of wine in the last ten years has increased, though the economic depression in 1930 caused a slight set-back.

¹ The "Rogers" hybrids.

Wine Production in Canada.

Year.	Quantity. (Thous. of Galls.)	Year.	Quantity. (Thous. of Galls.)
1923	826	1926	4,464
1924	1,157	1929	6,163
1925	1,243	1930	5,718

The wine produced in Canada is mostly consumed locally and very little is exported. In 1929 only 41,189 gallons and in 1930 only 22,479 gallons were exported, of which 40,116 gallons and 21,535 gallons respectively went to the United States, chiefly for use as altar wine.

91. The consumption of alcoholic beverages is under the control of special Liquor Control Boards in each province. According to the statistics the consumption of spirits per head of population was very slightly higher than in the United Kingdom, but the consumption of both beer and wine was at a much lower level.

Consumption per Head of Population.

			United Kingdom.		Canada.	
			Beer.	Wine.	Beer.	Wine.
			Galls.	Pints.	Galls.	Pints.
1927	..	..	16·6	2·6	5·5	0·7
1928	..	..	16·2	2·5	6·1	1·0
1929	..	..	16·1	2·5	6·8	1·0
1930	..	..	15·6	2·2	—	—

92. Although consumption of wine is thus at a comparatively low level, local production is still generally insufficient for the market and about one and a quarter million gallons are imported annually, chiefly from France. The sparkling wines come entirely from France, and total imports of them have been declining during the years 1927 to 1931.

It is, however, in the production of non-sparkling wines that the Empire as a whole is chiefly interested. Imports of these kinds of wines increased though slowly in the years 1927 to 1929, but suffered a heavy decline in 1931.

Imports of non-sparkling wines into Canada.

Year.	Total.	Chief Sources of Supply. (Thousands of Gallons).					
		France	Spain	Portugal	Italy	French Africa	United Kingdom
1927 ..	865	(297)	(280)	(169)	(58)	(42)	(36)
1928 ..	946	(313)	(290)	(160)	(41)	(36)	(36)
1929 ..	1,146	(437)	(351)	(160)	(82)	(34)	(34)
1930 ..	1,017	(362)	(311)	(140)	(88)	(48)	(48)
1931 ..	870	(296)	(248)	(118)	(71)		

The picture given by these figures differs widely from that presented by the import figures of non-sparkling wines into the United Kingdom. Not only are the quantities naturally much smaller, but the distribution is different—the proportion of sweet wines is clearly much less.

93. Although the total imports of wine into Canada are relatively small as has just been shown and are drawn from the wine-producing countries of Europe, imports of wine from Australia have shown a definite increase. As recently as 1926 they amounted only to some 3,000 gallons. In 1930, and again in 1931, they exceeded 26,000 gallons. Further, under the trade agreement between Canada and Australia made in August, 1931, Australian wines both still and sparkling receive substantial tariff preference on importation into Canada. The duty on Australian still wines containing more than 23° and less than 35° of proof spirit is 25 cents a gallon. The British preferential and the intermediate tariff rates are 55 cents a gallon for wine of less than 26° strength, and in the general tariff a further 30 per cent. *ad valorem* duty is added. In each case a further duty of 3 cents a gallon is levied for each degree over 26° up to 40°. Many countries, including most of the principal wine producing countries, received special rates, depending on a treaty with France, but these special rates ceased on the 16th June, 1932, when the Canadian denunciation of the French treaty took effect. Details of these special rates and the full Canadian tariff duties on wine are given in Appendix X.

Under the special Treaty rates certain low strength wines received preferential treatment, but the preference on Australian wines of the strengths at which they are usually exported from Australia receive a substantial advantage. The preferential rate introduced in 1931 covers practically the whole range of the usual Australian wines, both dry and sweet, although certain sweet wines which just exceed 35° do not receive any benefit from the agreement. With these fiscal advantages, coupled with the goodwill created by the Trade Agreement, there are possibilities for an expansion of consumption. Very rapid expansion can, however, hardly be looked for, in face of the present fall in the total imports of wine, and of the particular circumstances of the Wine Trade in Canada. There are no wine merchants in the ordinary sense in Canada. The

Liquor Control Board in each province is the only buyer of wine in the province. All the Boards, except Quebec, at present stock Australian sweet wines. Advertisement of alcoholic liquors is, moreover, restricted by the Control Board. In the province of Ontario, the advertisement of any alcoholic beverage is prohibited, and in other provinces advertisement has to be approved by the Liquor Control Board. When it is noted that over 60 per cent. of the population of Canada is in the provinces of Quebec and Ontario, immediate and rapid expansion in consumption of Australian wine is rendered unlikely by the fact that, in Quebec, Australian wines are not at present stocked, and in Ontario advertisement is prohibited. Expansion must be gradual and must depend mainly on goodwill in Canada and on the high quality of the wine offered for sale.

PALESTINE

94. Wine making is one of the industries in Palestine in which recent developments are due to the influx of Jewish settlers. The chief wine producing areas are to be found in the neighbourhood of the Jewish villages east and south of Jaffa. Most of the production consists of red fortified wines but good dry wines are also made. Wine is also distilled into brandy, for consumption as such or for the manufacture of liqueurs, but the high local cost of fuel militates against expansion of these industries. The imports of wine are very small and for the most part the wines consumed are those of local manufacture. Production has, however, outstripped the local market and the future, or indeed the present condition of the wine industry depends on the development of export markets. These are difficult to secure, and it is reported that some of the wine growers are either converting their vineyards into orange groves or are paying more attention to the production of table grapes.

In 1930, there were 15 establishments for the manufacture of wine. The following tables show the growth of production and the decline in exports, and the chief export markets in 1929, the latest year for which such information is available.

Wine Production and Exports of Palestine.

Year.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.
	(Quantities : thousands of galls.)							
Production of :								
Wine ..	555	325	484	327	490	399	788	908
Brandy ..	(Included with other spirits)					30	34	50
Total exports of Wine ..	n.a.	n.a.	365	285	202	256	226	237

Chief Export Markets in 1929.
Quantities :—thousands of gallons.

	Total Exports.	Chief Countries of Consignment.
Wine	226	Egypt (95), United Kingdom (30), Italy (21), Germany (18), Poland (17), Syria (10), Austria (10), France (9), Holland (5).
Brandy	3	Egypt (1), United Kingdom (0·9), Holland (0·6).
Liqueurs	1·5	Egypt (1·2), United Kingdom (0·2).

95. A comparison of the figures of production and export in the tables in the foregoing paragraph shows clearly that while production has grown exports have declined. Hence the difficulty to which we have already referred. The value of the total exports of wine in 1929 was £ P. 27,300 and in 1930 £ P. 31,000. These form less than two per cent. of the value of all exports from Palestine. The export trade is under the control of one co-operative organisation—the Association of Wine Growers of Palestine. Close attention is paid to the quality of the wines exported, but much of the Palestine sweet red wine consumed in the United Kingdom is blended on arrival—low strength with high strength—in order to reduce the total duty chargeable on import. We comment on this practice, which is by no means confined to the imports from Palestine, in section IX of our report. We refer to it here solely because such practices detract from the natural qualities the wines possess and lessen the inducement to ship quality wines. The present blends mostly compete for the cheaper sections of the market.

XIV.—BRITISH WINE INDUSTRY.

96. In paragraph 23 we referred to the existence of vineyards in England at the time when the Doomsday Book was compiled, but the climate never was suited to the outdoor cultivation of the vine. In times of peace and security the local manufacture of wine from freshly grown outdoor grapes was never commercially profitable and with the improvement in trade between England and the Continent, the making of wine from home-grown grapes nearly ceased. In the 17th and 18th centuries, however, a practice grew up of making beverages in England from dried raisins and sugar fermented by the use of different yeasts, which were described and sold as wine. In some cases flavourings such as ginger, orange, cowslip, were added. It is interesting to note that even in the time of George II when the duties on these "made wines" were revised, care was taken to exempt from the charge "any wines made by the owners or occupiers of British vineyards from the

juice of British grapes only growing thereon". Mr. Gladstone in his budget speech in 1860 referred directly to British wines. He said " But, besides wine imported from a colony, there is another element affecting the wine revenue, and that is the manufacture of what is called British wine. While the consumption of foreign wine has fallen there has been an increase in the manufacture of British wine. British wine—I mean that in the hands of highly respectable manufacturers—is made very much from raisins, sugar and brandy".

97. There is thus a long history behind the use in England of the word wine to describe beverages made in England from imported dried grapes or concentrated grape juice. Some of the firms engaged in making such beverages have been so occupied for over a century ; one in fact is entering on the third century of its existence. Yet to the ordinary person there is undoubtedly something incongruous in the title " British wines " when the absence of vineyards and the unsuitability of the climate for the outdoor cultivation of the grape are remembered. The title is apt to strike the resident in Australia and South Africa, who is unfamiliar with its long use in this sense in England and is accustomed to the legislation of his country, which lays down that the word " wine " can only be used to describe the fermented juice " of freshly gathered grapes ", as something more than an incongruity, even as a misdescription.

As recently as 1930 the Wine Trade Council in the United Kingdom advocated that it be made illegal to " offer or sell as " Wine " any liquid unless it is the juice of grapes fermented at the time of picking in the region of the picking and made in the manner which is usual and recognised as such in the district of its origin ". A movement is also on foot in several countries to obtain an international convention embodying the same idea.

In fact, countries in which wine is made from locally gathered grapes and in which it is illegal to use the word to describe any other liquid would welcome such restriction of its use, as generally do those who desire greater precision in the use of all terms descriptive of particular wines. The world trade in concentrated grape juice (or must) for wine making is, however, considerable and imports are not confined to those unfortunate countries in which grapes do not grow freely out of doors. We deal in the next section of our report with the question of terms used to describe particular wines.

98. Production and consumption of British made wines have throughout the years fluctuated greatly. Generally it increased very considerably when import duties were high or foreign supplies largely cut off, and decreased at other times. In the speech of 1860 from which we have just quoted, Mr. Gladstone calculated that the duty then paid on the materials used in making British wine amounted to 1s. 2d. a gallon. He continued " Therefore you have a duty on the foreign wine of 5s. 10d. the gallon—on colonial wine of 2s. 11d. the gallon, and on British wine of 1s. 2d. the gallon.

The result is that the consumption of foreign wine diminishes, the consumption of colonial wine has increased, and the consumption of British wine has doubled within the last ten years".

99. Detailed statistics of the production of British wines over a long period of years are not available, for the simple reason that until an excise duty was imposed in 1927 such returns were not required. Prior to that date the only recent years for which figures of production are obtainable are for 1907 and 1924, the years in which a general Census of Production was held. The available figures of the production of British made wines are as follows:—

Production of British Wines.

	Production.	Quantity paid excise duty.	Rate of duty per gallon.	Excise duty paid.
	Thous. of Galls.		s. d.	In hundreds of £.
Calendar years:—		} No excise duties leviable.		
1907	817			
1924	1,742			
Fiscal years ending March 31:—				
1928	2,449	2,372	1 0	119
1929	2,895	2,850	1 0	202
1930	2,899	2,795	1 6	210
1931	2,698	2,711	1 6	203
1932	2,715 ¹	—	—	—

¹ Provisional.

It is clear that between 1907 and 1924 production has more than doubled and since 1924 has increased by a further seventy per cent.

100. A considerable change has been effected in the method of making British wines, chiefly since the beginning of this century. In place of the raisins to which Mr. Gladstone referred, concentrated unfermented grape juice (or "must"—see paragraph 21) has been increasingly used and this has been especially the case since 1927.

In 1906 imports of "must" were for the first time shown separately in the Trade Returns of the United Kingdom. Since that date net imports of "must" have been as follows:—

Net imports of "Must" into the United Kingdom.

	Thousands of Gallons.	Percentage from Empire sources.
Average four years 1906-09	74	} Nil.
" " " 1910-13	130	
" " " 1919-22	86	
" " " 1923-26	260	
1927	409	13.4
1928	477	11.9
1929	771	18.0
1930	470	34.4
1931	215	24.8

Before the war the "must" was imported mostly from Greece and France. Since the war the imports from foreign sources have been chiefly from Greece, Spain and France, and those from Empire sources have come almost entirely from South Africa and Cyprus.

It is impossible to say from the last two tables how much of the increase in the imports of "must" since the war has been due to its use in place of raisins, and how much to an actual increase in the total annual production of British wines.

101. All British-made wines are sweet and include the following :—

Flavoured wines, such as ginger, orange, raisin, elderberry, cowslip ;

Pharmaceutical wines, such as orange, quinine, iron wine, citrate of iron wine ;

Unflavoured wines, such as British sherry and British red wine (port type).

Although raisins and sugar are still used as the basis of some of these wines, imported must is the chief basis used. The must is imported in a fluid state concentrated to about twice the natural density of grape juice. Fermentation is arrested for transit by the process of concentration, which consists of evaporating some of the water content of the juice *in vacuo* under pressure at low temperature and immediately sealing in drums. Reducing the proportion of water causes the remaining natural grape sugar to bear a greater proportion to the whole, and arrests fermentation. No alcohol has been formed in the must, and neither alcohol nor sugar is added. In the course of manufacture water is added to restore the concentrated must to its natural density, and fermentation is restarted by the addition of yeast. We are informed that the yeast used is a special culture obtained from grapes. Ordinary brewer's yeast is not used, except perhaps by some of the smaller and less important firms. With the best firms carefully controlled methods of fermentation of the imported must and of wine production in the United Kingdom have replaced the older somewhat rule-of-thumb methods. British wines may not be fortified in bond, and consequently, if fortified, only duty-paid spirit must be used. In practice, therefore, British wines contain only the limited amount of alcohol which can be secured by fermentation—varying between 22 and 28 degrees—for a duty of at least 75s. 4d. per proof gallon has to be paid on any spirit added to them.

In the early years of the present century sweet British-made wines were sold under the names British Port, British Sherry. Since the Anglo-Portuguese Treaty was negotiated in 1914 the use of the description "British Port" has been prohibited. These wines are sold under labels: Wine, Red Wine, with or without the addition of the words Port type.

102. The market for the flavoured and pharmaceutical wines is somewhat limited and special. The chief products are the sweet wines of the port and sherry types, which sell in working-men's clubs, in the cheaper off-license trade, and in some public-houses. The red wines, therefore, to some extent compete with the sweet wines of port type imported from Australia and South Africa, though it is possible that some find purchasers who would not be prepared to pay the price of imported wine.

103. Between 1834 and 1927 British-made wines were free from all excise duty. At the revision of duties in 1927 they were subjected to an excise duty of 1s. a gallon, which was raised in the following year to 1s. 6*d.* a gallon. The excise duties and customs duties on wines of similar alcoholic strength since 1913 are compared in the following table:—

Year.	Excise Duty per gallon on British Made Wine.	Lowest Import Duties—being Duties on Wines from Empire Countries overseas—per gallon.		Difference per gallon between Excise and lowest Import Duty on Wine of Strength about 28°
		Strength.	Duty.	
1913 to 1919 ..	s. d. Nil.	30° and under.	s. d. 1 3	s. d. 1 3
1920 to 1926 ..	Nil.	Do.	2 6	2 6
1927	1 0	{ 27° and under.	2 0	1 0
		{ Over 27°.	4 0	3 0
1928-1931 ..	1 6	{ 27° and under.	2 0	0 6
		{ Over 27°.	4 0	2 6

In so far as British-made sweet red wines compete with imported Empire wines of port type they compete with wines subject to an import duty of 4s. a gallon. On this basis it will be seen, from the foregoing table, that as far as excise and customs duties are concerned, the excise was 1s. 3*d.* a gallon below the import duty for several years prior to 1920, and subsequently has been 2s. 6*d.* a gallon below the comparable import duty. Excise does not, of course, represent the total duty paid by British-made wines. They have to pay whatever import duties are leviable on the materials imported for their manufacture. What those are, per gallon, we are unable to say; but owing to the changes in duties and the improvements in manufacture they are well below the 1s. 2*d.* a gallon quoted by Mr. Gladstone in 1860. Even allowing for improvements in manufacture and for the results of a more vigorous

sales policy, it would not be unreasonable to infer that some, at least, of the increased production and consumption of British-made wines since 1917, which we set out in paragraph 99, is attributable to the increase in the difference between the excise and customs duties since 1920. Certainly we attribute a large proportion of the increase in recent years in the consumption of imported Empire wines in the United Kingdom to the grant of preference in 1926, and equally it seems fair to ascribe a large proportion of the increase in the consumption of British made since 1920 to the increase in the difference between the excise and customs duties which has persisted since that date.

XV.—NAMES FOR EMPIRE WINES.

104. With the extension of world commerce, questions regarding the use of particular names to describe particular kinds of goods have become more and more the subject of dispute. International agreements have been reached covering many classes of goods, but in regard to some the views held in different countries remain obstinately irreconcilable. Wines fall in the latter group, and fierce controversy periodically breaks out over the names used in describing them. In recent years the movement in France to restrict by law the use of certain names to wines produced in particular localities has made great progress. Frequently the regulations which have been issued not only demarcate the districts in which the wines described under particular names must be made, but also the kinds of grapes to be used in their manufacture. Consistently with this policy of "delimitation" the French wine trade, and those who think with them in this matter, although they do not advocate the same degree of "particularisation" in wine-importing countries, none the less claim that words such as Burgundy and Claret should be reserved to wines which under the French regulations can be described as Bourgogne or Bordeaux.

105. The terms burgundy, claret, hock, etc., are so generally known in many countries of the Empire that their reservation to the products of particular localities would doubtless give to those products a valuable commercial advantage; all the more so, as for many years in many sections of the trade, at least in the United Kingdom, the terms burgundy and claret have been used to describe types of wine and not wines of particular localities. For over sixty years certain Australian wines have been sold in the United Kingdom under the description of Australian burgundy. The public who have bought those wines are accustomed to that description. There is no question of their being misled as to the type or origin of the wine they are purchasing. Whatever may have been the particular import of these names, burgundy, claret, hock, two or three centuries ago—and that is also a matter of dispute—the practice among the general public in the United Kingdom is to regard them to-day as describing types of wine. We believe the

practice is the same in other countries of the Empire. Any agreements or regulation to give restricted meaning to the words burgundy, claret and hock would do grave injury to an Empire trade which has been slowly built up during the greater part of a century and is still growing.

106. Those who advocate restricting the use of the words burgundy, claret, hock, etc., to the wines from particular localities claim as a precedent the legal restrictions on the use of the words "Port" and "Madeira" in the United Kingdom and some other Empire countries. By the Anglo-Portuguese Treaty of 1914¹ the words Port and Madeira are exclusively applicable to the wines produced in the Portuguese territory of the Douro and in the island of Madeira respectively. Not even all the wine produced in the Douro may be described as port, and a wine to be so described must be accompanied on importation by a certificate (see Appendix VIII, from the Customs House of Oporto. Though this treaty was negotiated as recently as 1914, the position in regard to the term port was different from that of, say, burgundy. Although some British-made sweet wine had for some 200 years been sold as "British port," the sales were comparatively limited, and no sweet wines of the port type were imported into the United Kingdom from Empire sources. In asking for "port" in 1914, a purchaser was presumably asking for wine from the Douro district: he had certainly not been accustomed to the idea of ports from various countries of origin. In that year and for many years previously Australian and other wines had been on sale as Australian burgundy, etc., which had not been the case in regard to port. In the years which have elapsed since 1914, the fact that Empire countries overseas are producers of still red and white wines (and also of sweet wines) has become still more widely known. In our opinion the analogy between the use of the terms port and madeira in the United Kingdom in 1914 and the use of terms such as burgundy, claret, hock, etc., in 1932, does not hold.

107. Sweet wines form some 60 per cent. of the total wine annually consumed in the United Kingdom. In the fiscal year ended 31st March, 1931, the amount of sweet wines entering consumption was 8,472,527 gallons, or 63·6 per cent. of the total consumption. Apart from 1,625,558 gallons of sherry and 36,880 gallons of madeira, the bulk of this wine was port type. Port wine—that is, wine that may legally be sold as "port"—formed 53·6 per cent. (4,539,593 gallons) of this wine.

Portugal, therefore, possesses a very important advantage in the reservation of the name "port" and the goodwill attaching to it. On the other hand, this legal restriction in the use of the word "port" has been a real difficulty in developing a new Empire

¹ The Anglo-Portuguese Commercial Treaty Act, 1916, came into operation on 23rd September, 1916. The treaty was concluded, however, in 1914.

trade. Although the Empire overseas did not export sweet red wines in 1914, a great proportion of those exported since 1920 have been of this type. They were, in fact, of port style and character, but under the law could not be described as port. Merchants have therefore resorted to the practice of indicating the type of their wine by adding port type, style, character or some such epithet. This practice has great disadvantages. If a purchaser asks for port, unqualified, he must legally be given wine of Portugal, whereas he may be quite content to have an Empire wine of similar type. Also to many people who are unacquainted with the requirements of the law this qualification suggests that the wine is an imitation of the sweet wine which they know as port. Empire sweet wines are not imitations. Although they possess a quality of their own, they are essentially of the port style or character, and are made in a similar way.

108. A suggestion has been made, and we believe experiments are being tried, to popularise a special name which will indicate Empire sweet wine. This possibility deserves careful consideration by the industry as soon as circumstances permit. A good deal is already done in this direction by the firms bottling Empire wine in the United Kingdom. They sell mostly on account of their own reputation, and are successful in the bottle trade. The public-house trade presents the most serious difficulties, and it is here that a generally accepted name would greatly help the industry. Austral or Aust has been proposed for Australian sweet wine, Pontac for similar South African wine. The revival of an old name for a wine, namely, Malmsey, has been mooted. In such attempts, however, the greatest care is needed in selecting names pleasant to the ear, and, if possible, having some association with the wine trade. The revival of old names also presents difficulties. Malmsey was a name given to wines produced originally in Crete, at the time of the Venetian occupation, and later was applied more generally to wine from the Levant.¹ A wine called Malmsey (from Madeira) is still obtainable in England, and wine made from the Malvasia grape, which gave its name to Malmsey, is still made in France (as Malvoisie), Italy (as Malvasia) and elsewhere in the Mediterranean. The choice of names to describe Empire sweet wines is one of extraordinary difficulty, and the expense involved in popularising them would be a heavy burden on the Empire wine industry. As regards types of wine other than port we propose that representatives of Empire countries that may be parties to any international agreement regarding appellations of origin in general should consider the strong reasons that exist for accepting the view that the usual names of wines have by use become generic in meaning.

¹ In 1490 a special duty was imposed on Malmsey imported by foreigners as a retaliatory measure against certain duties against English commodities imposed by the Venetians—Dowell, *History of Taxation and Taxes in England*.

109. This reasoning does not apply to wine only. Cheddar cheese is clearly understood to be a type of cheese, and the description is not confined to cheese made in the Cheddar district of England. A bull may correctly be described as an Aberdeen Angus, a Devon or a Friesland wherever it was born. In order to indicate that a cheese, a bull, or a cigarette is the product of the country which originally developed the type, it is well recognised that further description is necessary, stating where it is made, bred or grown. In early times, probably the best guarantee that a commodity was of a certain type was that it came from a particular region where the type was generally produced. In these days, however, such a guarantee is no longer feasible or sufficient. It is impossible in a great many cases for the limited region to supply the widespread demand for the type of product. It is also generally impracticable to give different names to products of the same type produced in various countries, and thus a convenient custom has arisen of using the original name in a generic sense qualified by the name of the actual country of origin. This applies to a very great range of products, and we can see no reason for making an exception of wine. The product of each particular country is, in our view, fully protected by the addition to its description of the country of origin. There can be no confusion in the mind of a purchaser of wines labelled: Spanish, French, or Australian Burgundy.

110. No difficulty is experienced with regard to names for Empire brandies. Brandy is universally accepted as a generic term. Cognac is, however, restricted in France to mean brandy produced in a special district legally defined. In the United Kingdom, Cognac is usually accepted as applying to particular French brandies, though this is not the case in several other countries, both Empire and foreign. In spite of this comparative strictness in the United Kingdom, the difficulty in regard to nomenclature does not arise there because the public has for long been accustomed to buy brandy on the name of the firm producing it or on advertisement of that name, as they do when buying whisky, gin or rum. In those circumstances the task before Empire competitors is to popularise the particular names of their brands.

XVI.—BRANDY.

Importance
to wine-
growing
countries.

111. No report on the production and marketing of Empire wine would be complete without reference to brandy, which is usually made by distillation from either wine itself or from the lees after the wine has been expressed. In Australia and South Africa legal enactments strictly enforced ensure that it is made solely from wine itself. When it is remembered that five to six gallons of wine are required to make one gallon of brandy, and that the production of wine in Empire countries has outstripped present effective demand, the importance to these wine producers of finding

extended markets for Empire brandy is obvious. In addition to Australia and South Africa, brandy is also made in Cyprus and in the mandated territory of Palestine.

112. The general statistical position is made clear in the following table, which compares production and consumption in the fore-mentioned countries with imports into the chief importing countries in the Empire.

Empire
production
and
consumption.

Average for three years 1928-30.

(Figures in thousands of gallons.)

PRODUCING COUNTRIES.					IMPORTING COUNTRIES.			
Country.	Pro-duction.	Con-sumption.	Imports.	Source of Imports.	Country.	Gross Imports.	Percentage from France.	
Union of South Africa ..	2,514	900	15	} France 100%	United Kingdom	484	97.5	
Australia ..	450	225	70		Canada ..	345	69	
Cyprus ..	500 (est.)	} Most of production.			New Zealand ..	51	100	
Palestine ..	88				Irish Free State ¹	27	85	
<p>Average annual excess of production over consumption in South Africa and Australia, 1,839,000 gallons; and there is also a surplus above home consumption in Cyprus and Palestine. The annual excess of production in 1930 amounted to 2,212,000 gallons.</p>					India ¹ ..	410	} Considerable portion shown as from United Kingdom.	
					British Malaya..	332		90
					Ceylon ..	110		100
					Total average: 1,760 gallons annual imports.			

¹ Some of the imports into these countries are shown as from the United Kingdom—being re-exported from that country.

113. This table shows the extent to which both in production and consumption of brandy the Union of South Africa surpasses any other country in the Empire. It shows further, that in the producing countries imports are comparatively small; only in Australia is the home market supplied to any appreciable extent by imports from foreign sources. It also indicates how small is the consumption of brandy relative to population in the United Kingdom. The annual per caput consumption in the Union of South Africa is about twelve times, in Australia about five times, and in Canada about three times what it is in the United Kingdom. The table also shews that although excess production in the Empire is sufficient to meet the total demands of all non-producing Empire countries yet the extent to which it actually does so is negligible. France has an almost entire monopoly of this trade.

114. In the following paragraphs we discuss the conditions of the market in the United Kingdom, but the foregoing analysis indicates that a larger Empire demand for Empire brandies must be cultivated in parts of the Empire other than the United Kingdom, if even present production is to be readily sold, let alone the supplies which may come from further extension. In fact, small though it be, it would seem that Empire brandies have made more progress

in the United Kingdom market than in that of any other Empire importing country, though as the table shews, the United Kingdom demand is small, and judged on a per caput basis, very small.

Decreasing consumption in United Kingdom.

115. For many years the consumption of brandy in the United Kingdom has been decreasing. Figures prior to 1922/23 include consumption in the Irish Free State, and are, therefore, not strictly comparable with those for later years. But both before and after 1922/23 the general trend has been markedly downwards. Between 1905 and 1913 consumption fell from about two million proof gallons to one and a half. In 1921/22, the last year in which the figures for the Irish Free State are included, it was down to 800,000 gallons. Between 1922/23 and 1930/31 consumption continued to fall in Great Britain and Northern Ireland from two-thirds of a million to half a million proof gallons (see Appendix I). This decline in the consumption of brandy is slightly greater than that in all spirits.

Consumption in the United Kingdom.

	Quantity. Thousands of proof gallons.		Expressed as percentage of 1921-22.	
	All Spirits.	Brandy.		
1921-22	15,162	666	100	100
1930-31	11,667	494	77	74

116. Whatever may be the causes of this steady decrease, whether greater general temperance, or the increased cost of spirits—the duty on which in pre-war days was 14s. 9d. per proof gallon, and since 1920 has been 72s. 6d., with an additional 2s. 6d. a gallon on those from foreign countries—or changes in fashion, the important point for this report is the unmistakable downward trend in consumption persisting for at least a quarter of a century. This trend will in all probability be checked sometime, but for the present Empire brandies in the United Kingdom have to compete in a narrowing market with foreign brandies which have for years enjoyed therein an almost complete monopoly.

Competition from French brandy.

117. The difficulty is increased by the fact that habit plays a very large part in directing consumers' purchases. Brandy has been made in France for centuries and in most markets the standards of quality and taste are those which have been associated with French brandies for a long time. The difficulty of choosing high grade brandies has led the public in the United Kingdom to rely on the names of a very few well known shippers of French brandies. This practice militates against the efforts of those who seek to persuade the public to learn the merits of Empire brandies.

118. Sentiment for Empire produce should induce a willingness on the part of the public to try Empire brandies, but a steady market can only be developed on the bases of quality and price. In regard to manufacture, purchasers have, in the strictly administered laws of Australia and South Africa, a guarantee that brandy exported from those countries is only made by distillation of wine. ^{Excise supervision of distillation in Empire countries.}

The law in the United Kingdom requires that no British or foreign spirits shall be delivered for home consumption unless they have been warehoused for a period of at least three years. Whereas, in Australia and South Africa, brandy may only be manufactured under close excise supervision, these certificates of age are issued by excise officers, who, under the local laws of the country, are also charged with seeing that only wine is used for making brandy. Therefore, though these certificates relate solely to age, they do in fact give assurance of the manner of manufacture.

119. Further evidence of the general high quality of Empire brandy is afforded by its increasing use in connection with medical treatment where reliance on purity and uniformity of quality is essential. South African brandy has been used by the London County hospitals as their sole brandy for the last five years. It is also in use in more than four hundred hospitals in the United Kingdom, including therein hospitals under private boards of management, hospitals controlled by the War Office, the Admiralty, the Ministry of Pensions and many hospitals controlled by county councils. Variations in quality, even though immaterial to the general consumer, may lead to disappointment when the brandy is tendered for medical purposes to institutions whose interest is directed towards ensuring to their patients an article of unvarying quality. Many Government departments and public bodies that control hospitals in the United Kingdom are clearly assisting the brandy industry of the Empire by selecting Empire brandies and we should like to see the practice become general. ^{South African brandy used in hospitals in United Kingdom.}

120. Brandy is one of those articles of commerce in which figures of "average" price have little meaning. Prices vary very greatly—from those paid for brandies used in cooking or in many public houses to those paid for particular brands or for specialities of exceptional age. There are cheap brandies valued in bond at shillings a gallon as well as expensive grades valued in bond at pounds a gallon. Between these extremes are numerous other grades. It is possible that the trade in cheap brandies exceeds in volume that of the most expensive kinds. But at the cheapest end of the trade the price competition from French and Spanish brandies is very severe. French brandy of a cheap grade was available in bond in May, 1932, at 4s. 6d. a proof gallon, whilst a witness informed us that "much cheaper quotations for Spanish and Portuguese brandies had come to his notice." South African brandy of comparable grade with the French was at that time about 6s. 2d. per proof gallon and so, with ^{Price.}

the tariff preference of 2s. 6d. was fairly comparable in price, Australian brandy, had it been available, would have been higher. In this case, the price for South African brandy was slightly below that asked for the French, but it was pointed out to us that the difference was insufficient to meet the cost of the educative work required, by advertisement and otherwise, to wean retailers and the public from the usual custom.

At the most expensive end of the trade, price is not the determining factor. Here custom, reputation and tradition are well nigh all powerful. It is probable that most of the sales of Empire brandies are affected in what might be described, for lack of a better term, the "middle" of the trade, though their quality deserves a wider recognition.

Consumption
in the United
Kingdom.

121. In the Trade Returns of the United Kingdom distinction is made between brandy imported in bottle and that imported in cask. To some extent this marks a distinction between the expensive and cheap brandies ; but the correspondence is only partial. Some good brandies from the Continent are imported in cask and bottled on arrival in the United Kingdom, whilst, on the other hand, some of the cheaper kinds of brandy are imported in bottles. For reasons of transport Empire brandies are mostly imported in cask. Tables of quantities imported, total value and average value per proof gallon, are given in Appendix V. The quantities of brandy taken from bond for sale in the United Kingdom in each of the fiscal years 1928-29 to 1930-31, and the quantities thereof of Empire origin are shown in the following table :

Brandy taken from bond for sale in the United Kingdom.

Year.	Total.	Empire.	Percentage of Empire origin to total.
	(Figures in gallons.)		
1928-29	553,083	2,638	0·48
1929-30	523,058	2,178	0·42
1930-31	491,451	2,410	0·49

Preference
on Empire
brandy.

122. Brandies of foreign origin are subject on import into the United Kingdom to a duty of 75s. per proof gallon ; those of Empire origin to 72s. 6d. This preference of 2s. 6d. a gallon is less both in amount and in proportion to total duty than the preferences given on Empire wines ; but the preferential rate is equal to the excise imposed on home-made spirits—such as whisky. The Irish Free State give a similar preference of 2s. 6d. a proof gallon to brandy of Empire origin. Of the other countries in the Empire importing

brandy and mentioned in paragraph 112 no preferences for Empire brandies are given by Canada, India and Ceylon. In New Zealand, Australian brandy is subject to a duty of 36s. a proof gallon plus 2 per cent. *ad valorem* and foreign and other Empire brandies to a duty of 42s. a proof gallon. In Malaya a preference of one Malayan dollar (2s. 4d.) per proof gallon on bottled brandy has recently been introduced.

123. Although the development of an export trade in brandy is of ^{Little} great importance to the wine-producing districts in Empire countries, ^{progress in} the progress made has been very small. In the United Kingdom a ^{Empire} precarious foothold in what might be termed the middle portion of ^{countries.} the trade has been secured; in other portions of the Empire, which are relatively larger consumers, not even that. The larger market can only be won on a quality and price basis. The conditions under which brandy is made in Australia and South Africa should give confidence in its general quality; and producers would be well advised to pay constant attention to quality. Reputation and tradition are probably more potent in influencing purchasers in the case of brandy than they are in the case of wine. For this reason, it would be helpful to the trade generally, if, in the course of time, a few brandies could be developed comparable with the best liqueur types.

XVII.—POSITION OF THE WORLD WINE INDUSTRY.

124. The wine industry of the world has for some years been in a serious position characterised by general increasing production and ^{Increasing} diminishing consumption and trade. ^{production} The wine producing countries ^{and declining} of the Empire have not been directly affected by the position, but ^{trade.} nevertheless, indirectly, the general position has increased the difficulties of disposing of their wine in the face of the competition from foreign countries. An international organisation, in which are associated most of the principal wine producing countries, was constituted at the end of 1924. After setting up its office in Paris, appointing officers and collecting information, it began its effective functions at the end of 1927 under the title of L'Office International du Vin. The objects of this Office are to collect and publish information on wine production and trade, to standardise methods of analysis, to prepare comparable statistics and to encourage scientific research into the hygienic and nutritive properties of wine.

125. From statistics received and as the result of enquiries addressed to many of the chief wine-producing countries L'Office International du Vin published, in October, 1930, a report¹ on the state of the world wine industry. The world acreage under vines ^{Increased} ^{acreage and} ^{yield per} ^{acre.}

¹ "La Crise Viticole Mondiale," by L. Douarche No. 205, 1st October, 1930.

had increased by over one million acres in 1929 as compared with the yearly average 1900 to 1908, thus :—

World Acreage under Vines.

	Average 1900-1908.	1929.	Increase.
		(Thousand acres.)	
Europe	15,234	15,842	608
Northern Africa and Union of South Africa.. ..	474	719	245
South America and Australia	563	722	159
Total	16,271	17,283	1,012

The average yield per acre in the vineyards of the world had increased from a yearly average 1909 to 1913 of 175 gallons to 233 gallons in 1929. Production of wine had increased as follows :—

<i>Year</i>	<i>Production (Millions of gallons)</i>
1900-1909	3,300
1909-1913	3,102
1924	3,432
1925	4,026
1926	3,904
1927	3,542
1928	3,894
1929	4,048

Diminished
consumption.

126. Consumption of wine per head of the population was less in 1929 than in 1925 in a great many countries, including the great consuming countries, France, Italy, Spain and Portugal, as well as Greece, Argentina, Scandinavia, Germany, Belgium, Switzerland and the United Kingdom. The export trade in wine of all the European wine-producing countries, except Hungary, has declined. Exports of wine from Portugal have been practically stationary for the last ten years. Exports from France in 1929 were 30·3 million gallons and from Italy 21·1 million gallons compared with 37·4 and 33·2 million gallons respectively in 1913. The note underlying the whole of the publication was one of alarm; in fact the publication itself was styled, "La Crise Viticole Mondiale". General over-production, and obstinate stocks were feared.

Lower
production
in 1930.

127. The figures available for 1930 show, however, that a considerable diminution in production has occurred in the principal European wine-producing countries. According to the International Institute of Agriculture at Rome, the production for 1930 together with the considerable stocks left over from the previous three or

four abundant years will probably be not more than sufficient for the needs of the wine trade. In their opinion there is no indication of a repetition of the crisis of over-production of wine. The total area planted with vines in Europe increased slightly from 2,594,000 acres in 1929 to 2,618,280 acres in 1930, but the total production of wine in Europe declined by 17 per cent. from 3,358,960,000 to 2,774,200,000 gallons. Decreases in wine production occurred in the following countries:—

<i>Country.</i>	<i>Percentage decrease in 1930 compared with 1929.</i>
	<i>Per cent.</i>
France	33
Spain	27
Italy	12
Portugal	12
Greece.. .. .	10

In two countries only the production increased—in Switzerland (66 per cent.) and in Yugo Slavia (38 per cent.)—but as these countries do not enter to any extent into the export trade, they do not affect the general position.

The preliminary reports for 1931 indicate that whilst French production was abundant, that in other European countries had either declined still further or, if in excess of the 1930 figure, was below the average of the five years 1925–1929. Apart, therefore, from any effects of the general economic depression, the International Institute of Agriculture did not foresee the emergence of any particular economic problem affecting the wine trade.

XVIII.—RESEARCH.

128. The position of scientific research into both viticulture and wine making has been fully dealt with in two reports published by the Empire Marketing Board.¹ In South Africa the Co-operative Winegrowers' Association has appointed a staff of highly qualified technical experts to assist wine makers to improve the quality of their output. It has also built and equipped at Paarl a laboratory for analysing wines, for investigating diseases of wine and for doing other research work in connection with viticulture. The wine producing States of Australia maintain viticultural experts who assist wine makers. In Cyprus, also, the wine industry is helped by the Government viticultural expert. It is customary for the experts appointed in these Empire countries to study vine growing and wine making in the older producing countries, and they keep in close touch with scientific developments

Reports of
the Empire
Marketing
Board.

¹ "The Chemistry of Wine Making"—E.M.B. 7 and "Viticultural Research"—E.M.B. 11, both published at 1s. each by His Majesty's Stationery Office.

all over the world. We desire, however, to refer to two problems regarding the study of wine making which have an important bearing on wine production and trade in the Empire.

Study of
wine pro-
duction.

129. In South Africa and Australia the climate at the time of the vintage is so hot that fermentation takes place very quickly, and considerable care has to be exercised to slow it down and make it steady. The same problem occurs in Algeria, where the heat at the vintage is great. There, the French colonists, through experience over a long period, have surmounted their difficulties and have succeeded in producing very acceptable dry wines. We recommend, therefore, that the wine industry of the two Dominions should consider the desirability of sending students of dry wine making to Algeria for study as well as to France and Germany. In Germany, particularly, the problem of slowing down fermentation does not arise; in fact, not infrequently the weather there has become so cold by the time the grapes are gathered that fermentation is very slow.

Problems of
maturation
of wine.

130. Another aspect of research to which we desire to draw attention is that of the possible effects of the chemical constituents of glass on the maturation of wine in bottles. On the suggestion of a small committee of scientists, the Empire Marketing Board has financed a preliminary scientific enquiry into this problem. The behaviour of wines in bottle suggests that the maturation which many wines go through in bottle may be related to the mineral content in the glass of the container. Experiments have been started with a view to testing the effect of several different kinds of glass on various types of wine, but some considerable time must elapse before the results can be observed. The results of the examination of this problem may well indicate the need for further experiments and research into other problems connected with the complicated process of maturation, regarding the real nature of which very little is at present known. A more complete scientific knowledge of the maturing process would be of particular service to the wine industries in Empire countries to which it is of the first importance that their wine should be matured in the best manner, and, if found to be possible, matured in a shorter time.

XIX.—SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS.

Conclusions.

131. We summarise our main conclusions as follows:—

(i) World production of wine is increasing, but consumption is tending to diminish.

(ii) In the United Kingdom, although the consumption of wine is slightly greater than in the opening years of the present century, it has declined since 1927.

(iii) None the less the consumption of Empire wines in the United Kingdom has substantially increased. Prior to 1925 the quantity of wine from the Empire overseas withdrawn from

bond in any year for sale in the United Kingdom only reached 1,000,000 gallons on two occasions—in 1913 and in 1915. Since 1926 it has only once been appreciably below 2,500,000 gallons. In 1931 it reached 3,258,000 gallons.

(iv) In 1931, over 25 per cent. of the total quantity of wine withdrawn from bond for sale in the United Kingdom came from the Empire overseas; twenty years previously (1911) it was under 9 per cent., and ten years previously (1921) it was under 7 per cent.

(v) These Empire wines have been helped in this rapid increase in public favour by the fiscal preferences granted in the United Kingdom in 1925 and 1927.

(vi) Production of British-made wines in the United Kingdom more than doubled between 1907 and 1924 and increased again by 55 per cent. by 1931. Production amounted to 2.7 million gallons in the year ended 31st March, 1931.

(vii) Empire countries overseas send to the United Kingdom both dry and sweet wines, but the large advance in sales has been in the sweet types. Empire wines have already largely replaced the Spanish and cheaper Portuguese sweet red wines.

(viii) Taste in the United Kingdom is turning towards sweet wines rather than dry, and in the case of dry wines, from red to white. Sherry is returning to favour.

(ix) Production of wine in recent years in the Empire overseas increased very rapidly, especially in Australia and South Africa; and extended markets are required to afford an outlet for the present production.

(x) Among importing countries in the Empire, the United Kingdom takes most wine from Empire exporting countries. Other importing Empire countries should be potential markets.

(xi) The market in the United Kingdom should be capable of expansion and extension—expansion in the types now sent and already known, and extension to fresh types. Our recommendations directed to these ends are:

(a) Continued care should be taken to maintain and develop the general improvement noted in recent years.

(b) Serious consideration should be given to placing on the market a limited number of wines of the highest grade. The establishment of an aristocracy of Empire wines would break down prejudice and bring in its train an increased demand for the more humble products.

(c) Australian and South African producers might attempt to popularise in the United Kingdom their sweet golden wines of sauternes and muscatello types.

(d) An opportunity also exists to produce and market in the United Kingdom an Empire sherry, but it must be a wine fit to compete in quality with Spanish sherry.

(xii) Both in Australia and South Africa the law provides that brandy can only be distilled from wine. These laws strictly administered provide a surety as to the purity of the brandy manufactured.

(xiii) As five to six gallons of wine are required to make one gallon of brandy, the importance to wine producers of extended markets for brandy is obvious.

(xiv) The brandy market is more difficult than that of wine, owing to established trade connections and traditions, and to the fact that consumption of brandy certainly in the United Kingdom has in recent years very substantially declined.

(xv) In spite of these difficulties brandies from Empire countries overseas have been obtaining a small but selected market on the ground of their quality. These brandies deserve to be better known.

(xvi) Fiscal preference in the United Kingdom was granted to Empire brandies in 1919. That preference is much smaller in amount and in relation to total duty than the preference on wine; but the preferential rate is the same as the excise duty on locally manufactured whisky which is kept at a high level for revenue reasons.

(xvii) Sales of Empire brandies in 1922-23 provided just over 0.2 per cent. of the total consumption of brandy in the United Kingdom, and in the fiscal year 1930-31 nearly 0.5 per cent. The growth in consumption has thus been slow.

(xviii) The markets for brandy in other Empire countries appear to merit the attention of producers. In some of these, brandy appears to be somewhat more popular than in the United Kingdom, and the imports from Empire sources are negligible.

H. J. WILSON (Chairman)	}	United Kingdom
THOMAS ALLEN		
HARRISON WATSON	}	Canada
F. L. McDOUGALL		
C. L. BAILLIEU	}	Australia
T. M. WILFORD		
R. S. FORSYTH	}	New Zealand
J. H. DIMOND		
J. W. DULANTY	}	South Africa
WILLIAM C. JOB		
B. N. MITRA	}	Irish Free State
P. P. GINWALA		
J. W. DOWNIE	}	Newfoundland
J. E. SHUCKBURGH		
J. H. BATTY	}	India
	}	Southern Rhodesia
	}	Colonies and Protectorates
		D. T. CHADWICK (Secretary)
		T. L. CATLING (Assistant)

JUNE, 1932.

APPENDIX I.

Total and per caput consumption of Wine¹, Beer and Spirits in the United Kingdom, 1905 to 1930.

Calendar Year.	Total Consumption.				Per Caput Consumption.		
	Wine.	Beer.	All Spirits.	Brandy.	Wine.	Beer.	Spirits.
	Thou. gallons.	Million gallons.	Thou. proof gallons.	Thou. proof gallons.		Pints.	
1905	11,891	1,197	39,332	2,079	2·24	222·8	7·4
1906	12,278	1,221	39,264	2,080	2·24	225·3	7·3
1907	12,282	1,216	39,983	2,069	2·24	222·5	7·3
1908	11,293	1,186	38,079	1,960	2·08	215·0	6·9
1909	11,399	1,163	31,063	1,550	2·08	208·9	5·6
1910	12,672	1,182	29,266	1,457	2·24	210·5	5·2
1911	11,218	1,233	30,687	1,561	2·00	217·6	5·4
1912	11,230	1,220	30,527	1,455	2·00	214·6	5·4
1913	11,368	1,269	31,794	1,504	2·00	222·1	5·6
Average 1905-1913	11,737	1,207	34,444	1,746	2·12	217·7	6·2
1919	19,174	781	21,708	1,886	3·36	135·8	3·8
1920	15,054	969	22,138	1,329	3·30	166·6	3·8
1921	11,175	877	18,542	880	1·92	148·5	3·6
1922	12,549	754	16,919	716	2·08	127·0	3·3
1923	13,239	738	14,729	676	2·40	132·3	3·0
1924*	15,334	789	14,725	672	2·72	140·6	3·0
1925	16,071	795	14,354	634	2·88	141·1	2·9
1926	16,786	762	13,170	591	2·96	134·9	2·6
1927	16,909	754	13,161	570	2·96	132·7	2·6
1928	13,467	738	12,656	542	2·40	129·4	2·5
1929	14,394	735	12,667	540	2·48	128·6	2·5
1930	13,721	719	11,527	487	2·40	125·2	2·2
Average 1922-1930	14,719	754	13,767	603	2·59	132·4	2·7

¹ British wines are not included.

* Prior to 1924, figures include the Irish Free State.

The figures for wine in the foregoing table represent actual consumption year by year, while those for beer and spirits do not, but indicate only the trend of consumption during the period shewn. In the case of beer, the figures are calculated from statistics of "standard barrels," that is as if the beer had a specific gravity of 1,055°. The strength of beer actually consumed is changed from time to time. Thus the average gravity of all beer retained for consumption in the year ended 31st March, 1932, was approximately 1,041·6°. It has been reduced since the war owing to increased taxation. Similarly, with spirits, the figures relate to spirit at "proof" strength, whereas most spirit is sold considerably "under proof"—usually 30 u.p. at present. For recent years, therefore, the figures in the table are less than the actual consumption of beer and spirits. Actual consumption figures are not available.

APPENDIX II.

Production of wine in the principal wine producing countries.
 Figures for foreign countries and world total based on the International Year Book of Agriculture.
 For Empire countries (except Cyprus and Palestine) based on figures prepared by the Governments concerned.

	Average 1909-13.	1926.	1927.	1928.	1929.	1930.	Average 1926-30.	
		(Thousands of gallons.)						
Australia ¹	5,251	16,231	20,456	17,303	18,600	16,009	17,720	
Canada	1,000	2,728	2,734	4,355	6,163	5,718	4,340	
Cyprus	4,175	5,486	5,250	5,302	4,768	3,867	4,935	
Malta	1,068	662	867	1,123	960	684	859	
Palestine	—	327	490	399	536	968	544	
South Africa ²	7,501	17,015	17,256	20,257	19,473	20,625	18,925	
Total Empire	18,995	42,449	47,169	48,280	51,944	48,031	47,575	
Austria	15,630	10,153	4,971	17,045	12,596	26,453	14,244	
Bulgaria	7,068	33,566	33,613	37,689	35,952	57,750	39,714	
Czecho-Slovakia	—	3,069	2,324	7,110	4,928	10,428	5,572	
France.. .. .	1,104,822	937,337	1,126,464	1,326,881	1,383,643	924,244	1,139,714	
Germany	34,640	21,763	31,403	45,156	44,421	61,902	40,929	
Greece	84,584	59,216	49,936	67,646	56,017	30,400	52,643	
Hungary	43,942	28,452	40,176	67,813	54,771	88,475	55,937	
Italy	1,034,224	815,561	784,193	1,029,957	903,097	798,992	866,360	
Portugal	91,119	81,868	208,380	100,677	146,743	127,259	132,985	
Roumania	31,173	111,408	156,193	156,766	111,007	184,478	143,970	
Spain	328,950	346,531	623,069	485,798	549,870	401,017	481,257	
Switzerland	9,861	10,009	7,186	14,518	17,598	14,080	12,678	
Yugo-Slavia	6,133	64,053	62,796	94,993	64,009	88,355	74,841	
Total Europe (including Russia)	2,757,920	2,522,986	3,053,160	3,382,720	3,358,960	2,774,200	3,018,405	
Algeria	173,854	184,313	176,884	300,625	282,275	299,202	248,660	
Argentina	97,071	89,856	160,300	181,695	—	—	143,950 ³	
Brazil	—	18,936	18,493	16,556	19,800	—	18,446 ³	
Chile	47,242	67,860	76,362	72,115	70,443	—	71,695 ³	
Japan	96	114	121	170	115	—	130 ³	
Tunis	7,611	16,208	13,792	20,544	23,729	21,997	19,254	
Uruguay	3,439	8,779	7,892	9,002	12,868	—	9,635 ³	
Total World	3,104,657	2,901,602	3,546,620	4,028,200	3,997,400	—	3,618,456	

¹ Year ended 30th June of the year at head of column. ² Vintage of the year stated. ³ Average of period for which figures are available.

APPENDIX III.—TABLE A.
Wine : Exports of Australia.

Year ended 30th June.	Sparkling Wine.		Still—not exceeding 27° —bottled.		Still—not exceeding 27° —in bulk.		Still— exceeding 27° —bottled.		Still— exceeding 27° —in bulk.		Wines, Other.		Total Wine.	
	1929.	1930.	1929.	1930.	1929.	1930.	1929.	1930.	1929.	1930.	1929.	1930.	1929.	1930.
<i>Destination.</i>	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.	Galls.
United Kingdom..	253	1,304	331	1,406	366,581	448,437	160	253	1,244,984	1,560,542	323	—	1,612,632	2,011,942
Canada ..	—	—	874	644	—	3,418	711	10,413	7,799	9,665	—	—	9,384	24,140
New Zealand ..	2,101	1,035	8,139	7,056	2,240	1,363	40,564	45,984	48,715	76,254	563	16	102,322	131,708
India ..	—	—	—	—	1,489	533	—	—	—	—	—	—	1,489	533
Pacific Islands—														
Fiji ..	—	—	706	632	775	1,128	931	871	1,453	1,218	—	—	3,865	3,849
New Guinea ..	163	71	549	594	1,604	1,539	1,235	690	—	—	—	—	3,551	2,894
Nauru ..	—	—	—	—	—	—	443	484	—	—	—	—	443	484
Other Islands ..	222	139	635	916	1,192	737	721	714	152	318	—	—	2,922	2,824
Papua ..	—	—	677	267	—	—	569	310	—	—	—	—	1,246	577
Other British Coun- tries.	187	102	298	394	1,272	1,380	31	34	525	271	30	18	2,343	2,199
Total to—														
British Countries	2,926	2,651	12,209	11,909	375,153	458,535	45,365	59,753	1,303,628	1,648,268	916	34	1,740,197	2,181,150
Foreign Countries	6	4	46	69	487	202	169	75	74	33	—	—	782	383
Total ..													1,740,979	2,181,533

APPENDIX III.—TABLE B.
Wine : Exports of South Africa. Quantities in gallons.

Destination.	PORT.						SHERRY.						OTHER HEAVY WINES.					
	In Wood.			In Bottle.			In Wood.			In Bottle.			In Wood.			In Bottle.		
	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.
United Kingdom	52,901	60,476	65,804	99	105	59	17,552	34,560	15,201	12	16	26	258,953	367,894	550,020	227	252	222
Canada	—	—	9,747	—	—	—	—	—	—	—	—	—	—	2,659	—	—	—	—
New Zealand	29,746	22,108	11,030	810	480	162	9,950	8,579	5,663	204	150	142	2,995	3,368	1,147	508	660	128
India	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	35
Straits Settlements	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	104	10
Ascension Island	—	—	—	28	—	—	—	—	—	—	—	—	—	—	—	—	22	—
Kenya	95	12	—	113	134	84	—	—	—	29	62	100	72	27	75	—	130	112
Tanganyika	—	—	—	—	—	—	—	—	—	34	—	—	—	7	—	—	2	5
Nyassaland	20	—	—	—	—	—	15	—	—	—	—	—	—	—	—	—	—	—
St. Helena	—	—	—	20	6	—	—	268	185	—	—	—	—	—	—	—	—	—
British West Africa	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
British Sudan	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Seychelles Islands	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mauritius	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hong Kong	—	—	—	—	—	—	—	—	—	—	—	—	—	95	1,717	363	—	—
Total—British	82,762	82,596	86,681	1,070	725	305	27,517	43,407	21,112	370	274	302	262,093	373,074	554,420	1,027	1,050	518
Argentina	—	—	16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Belgium	—	—	—	—	—	—	—	—	—	—	—	—	129	—	21	—	40	—
Belgian Congo	226	121	59	28	14	—	20	31	8	18	—	—	384	1,255	1,205	78	15	50
Brazil	—	87	—	—	—	—	—	—	—	—	—	—	—	176	—	—	—	—
Denmark	—	—	—	—	—	—	—	—	—	—	—	—	—	1,277	1,830	—	—	—
France	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Egypt	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	—
Germany	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Holland	—	1,602	32	10	2	2	171	301	129	—	14	—	190	4,873	19,645	11	38	4
Dutch East Indies	—	—	—	7	—	—	—	—	—	—	—	—	17,283	18,204	14,047	22	2	—
Italy	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Japan	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Madagascar	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mexico	—	81	32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Norway	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Portuguese East Africa	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Portuguese West Africa	—	—	—	2	36	—	—	—	—	—	—	—	—	—	—	—	—	—
United States	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sweden	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total—Foreign	226	1,891	139	60	54	2	191	420	137	70	74	5	17,986	26,001	37,807	234	225	144
TOTAL	82,988	84,487	86,820	1,130	779	307	27,708	43,827	21,249	440	348	307	280,079	399,075	592,227	1,261	1,275	662

Destination.	CLARET.						OTHER LIGHT WINES.						SPARKLING WINES.			TOTAL (All Wines).		
	In Wood.			In Bottle.			In Wood.			In Bottle.			1929.	1930.	1931.	1929.	1930.	1931.
	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.	1929.	1930.	1931.						
United Kingdom	146,436	2,871	13,436	152	24	8	25,609	105,270	173,786	322	523	818	52	79	3,371	502,315	572,070	822,853
Canada	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	12,409
New Zealand	202	200	272	100	60	40	483	282	384	—	30	—	—	—	—	44,998	35,937	18,968
India	—	—	—	—	—	—	—	—	70	—	2	84	—	—	60	—	3	229
Straits Settlements	—	—	—	—	—	—	—	—	—	10	—	—	—	—	—	184	10	22
Ascension Island	—	—	—	—	—	—	—	—	—	88	6	16	8	—	—	146	6	16
Kenya	—	—	34	28	18	46	43	—	67	102	52	106	24	14	14	624	517	484
Tanganyika	119	87	33	—	10	—	—	—	—	2	10	22	48	20	10	178	127	104
Nyassaland	—	—	—	4	6	—	—	—	—	16	—	—	4	—	—	91	6	285
St. Helena	—	—	—	4	—	—	—	—	—	4	22	—	—	—	—	68	319	257
British West Africa	—	—	—	—	—	—	—	—	—	—	—	12	—	—	—	—	—	12
British Sudan	—	—	—	4	—	—	—	—	—	12	—	—	4	—	—	20	—	—
Seychelles Islands	—	—	—	—	—	—	—	—	—	30	—	—	—	—	—	30	—	—
Mauritius	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	95	1,747	363
Hong Kong	—	67	75	—	—	—	—	—	—	68	—	—	—	—	—	—	135	75
Nigeria	—	—	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—	4
Total—British	146,757	3,225	13,850	292	118	98	26,135	105,650	174,309	586	645	1,041	140	113	3,455	548,749	610,877	856,091
Austria	—	—	—	—	—	—	—	—	—	—	—	12	3	—	—	3	—	16
Argentina	—	—	—	—	—	—	—	—	—	2	—	2	—	—	—	131	40	23
Belgium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7,203	4,777	—
Belgian Congo	5,823	4,696	2,161	4	12	—	286	1,029	1,266	96	30	28	16	—	—	6,919	283	1
Brazil	—	—	—	—	—	—	—	—	68	—	—	—	—	—	—	—	1,605	2,019
Denmark	—	328	115	—	—	—	—	—	—	—	—	—	—	—	6	—	—	57
France	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	16	—	—
Egypt	—	—	—	—	6	—	—	—	—	—	14	—	—	—	—	—	20	—
Germany	—	—	—	—	—	—	—	150	—	51	12	2	—	—	6	433	6,792	19,820
Holland	—	—	—	—	—	—	734	70	1,194	2	4	18	—	—	—	18,064	18,280	15,259
Dutch East Indies	—	—	—	—	—	—	—	—	—	24	—	28	—	—	—	24	22	30
Italy	—	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—	4	—
Japan	—	—	—	8	—	—	—	—	—	16	—	—	8	—	—	117	6	10
Madagascar	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	89	2
Mexico	—	112	65	—	—	—	—	35	—	—	—	4	—	—	—	—	228	105
Norway	—	—	—	—	—	4	—	—	—	6	—	—	—	—	—	6	—	—
Portuguese East Africa	58	—	—	—	—	—	—	4	11	122	78	—	22	96	12	241	380	46
Portuguese West Africa	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	28	—	—
United States	—	—	—	—	—	6	—	—	—	2	18	6	—	—	—	12	38	16
Sweden	—	—	—	—	—	—	—	—	—	—	—	18	—	—	—	—	401	1,077
Total—Foreign	5,881	5,136	2,341	12	22	10	1,024	1,295	2,528	261	156	128	49	96	29	25,994	35,370	43,270
TOTAL	152,638	8,361	16,191	304	140	108	27,159	106,945	176,837	847	801	1,169	189	209	3,484	574,743	646,247	899,461

APPENDIX IV.—TABLE C.

Brandy entered for Home Consumption in the United Kingdom.

Year (ended 31st March).	Quantities retained for Consumption.		
	Foreign.	Empire.	Total.
1913-14	—	—	1,544,153
1917-18	—	—	1,318,138
1918-19	—	—	1,542,421
1919-20 ¹	—	—	1,923,408
1920-21	1,121,877	3,797	1,125,674
1921-22 ²	793,765	1,929	795,694
1922-23	664,562	1,527	666,089
1923-24	696,060	2,444	698,504
1924-25	650,445	2,699	653,144
1925-26	634,563	1,379	635,942
1926-27	553,244	1,240	554,484
1927-28	580,437	1,764	582,201
1928-29	553,083	2,638	555,721
1929-30	523,058	2,178	525,236
1930-31	491,451	2,410	493,861

¹ Duty on foreign brandy increased by 2s. 6d. a proof gallon on 1st September 1919, that on Empire brandy remaining unaltered, thereby introducing Preference for Empire brandy.

² Prior to 1922-23, the Irish Free State is included, subsequently it is not.

Country.	Quantity, proof gallons.			Value £.			Average declared value in shillings per proof gallon.		
	1928.	1929.	1930.	1928.	1929.	1930.	1928.	1929.	1930.
France	159,268	174,748	161,714	104,759	117,158	99,477	13·2	13·4	12·3
Other foreign countries	462	3,512	935	382	1,245	368	16·1	7·1	7·9
Total foreign	159,730	178,260	162,649	105,141	118,403	99,845	13·2	13·3	12·3
Empire countries—									
South Africa	} 4,346	7,083	2,308	2,595	2,889	2,257	11·9	7·1	19·6
Australia									
Cyprus									
Palestine	—	207	791	—	117	274	—	11·3	6·9
Total Empire	4,346	7,290	3,099	2,595	3,006	2,531	11·9	8·2	16·3
Gross Total	164,076	185,550	165,748	107,736	121,409	102,376	13·1	13·1	12·4
Percentage, Empire	2·6	3·9	1·9	2·4	2·5	2·4			

Imported in Bottles.

Country.	Quantity, proof gallons.			Value £.			Average declared value in shillings per proof gallon.		
	1928.	1929.	1930.	1928.	1929.	1930.	1928.	1929.	1930.
France	321,962	322,040	287,904	858,279	858,875	778,756	53·3	53·3	54·1
Other foreign countries	851	1,447	1,110	1,591	2,384	1,615	37·4	32·9	29·1
Total, foreign	322,813	323,487	289,014	859,870	861,259	780,371			
Empire countries	508	562	1,410	1,101	1,388	3,056	43·3	49·4	43·3
Gross Total	323,321	324,049	290,424	860,971	862,647	783,427			
Empire percentage	0·16	0·17	0·48	0·13	0·16	0·39			

APPENDIX IV.—TABLE C.

Brandy entered for Home Consumption in the United Kingdom.

Year (ended 31st March).	Quantities retained for Consumption.		
	Foreign.	Empire.	Total.
1913-14	—	—	1,544,153
1917-18	—	—	1,318,138
1918-19	—	—	1,542,421
1919-20 ¹	—	—	1,923,408
1920-21	1,121,877	3,797	1,125,674
1921-22 ²	793,765	1,929	795,694
1922-23	664,562	1,527	666,089
1923-24	696,060	2,444	698,504
1924-25	650,445	2,699	653,144
1925-26	634,563	1,379	635,942
1926-27	553,244	1,240	554,484
1927-28	580,437	1,764	582,201
1928-29	553,083	2,638	555,721
1929-30	523,058	2,178	525,236
1930-31	491,451	2,410	493,861

¹ Duty on foreign brandy increased by 2s. 6d. a proof gallon on 1st September 1919, that on Empire brandy remaining unaltered, thereby introducing Preference for Empire brandy.

² Prior to 1922-23, the Irish Free State is included, subsequently it is not.

Imported in Cask.

Country.	Quantity, proof gallons.			Value £.			Average declared value in shillings per proof gallon.		
	1928.	1929.	1930.	1928.	1929.	1930.	1928.	1929.	1930.
France	159,268	174,748	161,714	104,759	117,158	99,477	13·2	13·4	12·3
Other foreign countries	462	3,512	935	382	1,245	368	16·1	7·1	7·9
Total foreign	159,730	178,260	162,649	105,141	118,403	99,845	13·2	13·3	12·3
Empire countries—									
South Africa	} 4,346	7,083	2,308	2,595	2,889	2,257	11·9	7·1	19·6
Australia									
Cyprus									
Palestine									
Total Empire	4,346	7,290	3,099	2,595	3,006	2,531	11·9	8·2	16·3
Gross Total	164,076	185,550	165,748	107,736	121,409	102,376	13·1	13·1	12·4
Percentage, Empire	2·6	3·9	1·9	2·4	2·5	2·4			

Imported in Bottles.

Country.	Quantity, proof gallons.			Value £.			Average declared value in shillings per proof gallon.		
	1928.	1929.	1930.	1928.	1929.	1930.	1928.	1929.	1930.
France	321,962	322,040	287,904	858,279	858,875	778,756	53·3	53·3	54·1
Other foreign countries	851	1,447	1,110	1,591	2,384	1,615	37·4	32·9	29·1
Total, foreign	322,813	323,487	289,014	859,870	861,259	780,371			
Empire countries	508	562	1,410	1,101	1,388	3,056	43·3	49·4	43·3
Gross Total	323,321	324,049	290,424	860,971	862,647	783,427			
Empire percentage	0·16	0·17	0·48	0·13	0·16	0·39			

APPENDIX V.—TABLE B.
 United Kingdom. Imports of Red Wine from Spain and Portugal.
 (Quantities in thousands of Gallons.)

Alcoholic Strength.	1925.		1926.		1928.		1929.		1930.	
	Spain.	Portugal.	Spain.	Portugal.	Spain.	Portugal.	Spain.	Portugal.	Spain.	Portugal.
23°	2	0·8	6	0·5	126	21	58	17	61	10
24°	11	0·5	9	1·0	501	120	485	164	391	116
25°	19	0·3	16	1·0	247	37	290	41	253	66
23° to 25°	32	1·6	31	2·5	874	178	833	222	705	192
26°	34	15	48	4	1	0·3	1	0·8	1	0·3
27°	67	145	151	53	17	0·5	12	0·7	5	—
28°	577	827	505	844	46	2·0	16	2·2	21	1·4
29°	1,047	984	922	986	43	7·3	91	13·4	96	7·2
30°	411	187	301	107	14	14·5	32	23·6	8	13·9
26° to 30°	2,136	2,158	1,927	1,894	121	24·6	152	40·7	131	22·8
39°	23	152	5	195	23	78	13	246	6	75
40°	31	96	20	155	42	64	38	269	38	128
41°	17	29	1	37	38	48	45	73	39	57
42°	0·2	4	0·1	7	13	14	19	8	13	15
39° to 42°	71·2	281	26·1	394	116	204	115	596	96	275
Total red wine ..	2,271	8,487	2,016	7,835	1,150	5,004	1,142	5,935	970	5,082

Consumption of Spirits, Wine and Beer in various countries, taken from "Norwegian Government Statistics Book," 1930, published in the Minutes of Evidence before the Royal Commission on Licensing (England and Wales), 1931.

	SPIRIT.		WINE.		BEER.		TOTAL— PURE ALCOHOL.	
	Various at 50 per cent. Alcohol.	Pure Alcohol.	Various.	Pure Alcohol.	Various.	Pure Alcohol.	1923-27.	1919-22.
	Litres.	Litres.	Litres.	Litres.	Litres.	Litres.	Litres.	Litres.
Australia	1.94	0.97	2.27	0.29	51.10	2.29	3.55	4.31
Canada	1.75	0.87	1.06	0.13	19.10	0.95	1.95	2.39
Great Britain and Northern Ireland	1.60	0.80	1.60	0.22	77.40	3.87	4.89	6.17
Irish Free State	1.21	0.60	1.12	0.15	40.51	2.02	2.77	?
New Zealand	2.22	1.11	0.68	0.08	43.15	1.94	3.13	3.65
Argentina	1.54	0.77	5.80	5.80	18.00	0.72	7.29	7.86
Austria	3.32	1.66	14.50	1.45	72.40	2.53	5.64	5.75
Belgium	2.15	1.07	8.17	0.82	184.80	7.39	9.28	8.98
Bulgaria	2.24	1.12	21.75	2.28	2.60	0.12	3.52	2.54
Czecho-Slovakia	3.43	1.71	3.15	0.34	61.80	2.47	4.52	3.52
Danzic	3.80	1.90	1.80	0.21	28.33	0.99	2.10	3.41
Denmark	1.32	0.66	1.49	0.21	62.70	2.04	2.91	2.89
Estonia	6.04	3.02	0.15	0.09	9.34	0.30	3.41	3.73
France	5.49	2.74	?	12.40	42.0	1.47	16.61	17.61
Germany	2.10	1.05	4.06	0.44	67.60	2.36	3.85	2.66
Greece	4.25	2.12	35.56	4.62	1.78	0.01	6.75	?
Holland	2.23	1.11	1.68	0.21	25.50	1.75	3.07	3.00
Hungary	2.82	1.41	32.46	3.24	6.08	0.24	4.89	5.73
Italy	1.36	0.68	?	12.60	3.14	0.12	14.84	13.77
Lettonia	3.39	1.69	0.27	0.03	4.86	0.19	1.91	?
Lithuania	2.04	1.02	0.09	0.01	4.52	0.18	1.21	?
Norway	0.87	0.43	2.64	0.45	25.50	1.12	2.00	2.00
Rumania	3.40	1.70	14.80	1.48	4.50	0.18	3.36	1.35
Russia	1.72	0.86	0.50	0.06	3.21	0.12	1.04	?
Spain	4.25	2.12	87.80	12.29	2.40	0.09	14.50	15.83
Sweden	4.28	2.14	0.66	0.07	37.6	0.98	3.19	3.03
Switzerland	5.00	2.50	45.20	4.52	46.4	1.85	8.87	11.82
Yugoslavia	1.09	0.54	9.73	1.16	5.04	0.20	1.90	1.22

APPENDIX VII.

Per caput consumption of Wine in various countries, based on statistics published by the "Office International du Vin," 1931.

Country.	Per Caput Consumption (Pints). 1900-14. 1920-27.		Country.	Per Caput Consumption (Pints). 1900-14. 1920-27.	
Algeria	28.0	27.5	Yugoslavia ..	—	51.2
Germany	6.5	6.0	Sweden ¹	1.1	1.1
Austria ¹	10.6	28.2	Switzerland ¹ ..	99.4	85.9
Belgium	7.6	11.4	Czecho Slovakia	—	6.7
Bulgaria ¹	13.2	40.1	Tunis	12.0	18.3
Chili	80.8	111.9	Uruguay ¹	46.8	41.7
Denmark ¹	2.3	2.6			
Egypt	17.1	16.7			
Spain ¹	123.2	144.8			
France	247.3	258.7			
Greece	84.3	47.2			
Hungary ¹	26.4	51.9			
Indo-China	0.7	0.7			
Italy	207.7	172.5			
Japan	0.1	0.7			
Madagascar ..	1.4	1.8			
Mexico	0.7	0.7			
Norway ¹	2.8	4.4			
Netherlands ..	3.2	3.3			
Poland	—	0.2			
Portugal	91.5	102.3			
Argentina ¹	118.8	109.3			
Roumania ¹	31.7	61.6			

¹ Details are for different periods, thus :—

Austria	1900-15
Bulgaria	1900-15
Roumania	1900-15
Sweden	1900-15
Switzerland ..	1900-15
Spain	1901-15
Uruguay	1910-17
Denmark	1900-16
Norway	1900-16
Italy	1901-16
Hungary	1905-15
Argentina	1912-18

APPENDIX VIII.

PORT WINE CERTIFICATE.

The form of certificate which has been determined by the Portuguese Government in respect of the importation of Port Wine from Portugal is (in English and Portuguese) as follows :—

[Copy.]

REPUBLICA PORTUGUEZA.

ALFANDEGA DO PORTO.

Certificado de Origem.

No.....

Certificate of Origin.

VINHO DO PORTO.

PORT WINE.

Certifico que exportou

I certify that exported

pelo vapor para

by the S.S..... to

..... litros de vinho da região do DOURO a reconhecido como vinho do Porto, em conformidade com a legislação da Republica Portugueza.

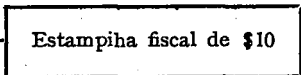
..... litres of wine produced in the DOURO district and recognised as Port Wine according to Portuguese Republic law.

Com as marcas e nas vasihas abaixo declaradas, conforme onsta do despacho no.

With the marks, and in the casks as stated below, according to despatch no.

Alfandega do Porto, de de 19.....

Oporto Custom House 19.....



APPENDIX IX.
United Kingdom—Imports of Must.
Country of Origin.

Year.	France.	Greece.	Spain.	Total— Foreign.	Cyprus.	South Africa.	Total— British.	Total.	Empire Percentage of Total.
Quantities.—Thousands of gallons.									
1906	23	16	—	42	—	1	1	43	—
1907	19	35	—	109	—	0·7	1	110	—
1908	11	65	—	86	—	—	—	86	—
1909	10	46	—	66	—	—	1	67	—
1910	50	87	—	164	—	—	—	164	—
1911	9	119	—	144	—	—	1	145	—
1912	11	68	—	87	—	—	—	87	—
1913	7	114	—	133	—	—	—	133	—
1919	—	62	—	80	—	—	3	83	3·6
1920	—	24	—	34	—	—	3	37	8·1
1921	—	30	4	4	—	3	4	48	8·3
1922	—	65	2	76	—	—	20 ¹	96	20·8
1923	—	70	6	96 ¹	—	3	42	138	30·5
1924	—	168	8	241	—	10	10	251	4·0
1925	—	81	10	138	—	30	40	178	22·4
1926	5	146	22	193	—	19	19	212	9·0
1927	102	207	41	354	—	55	55	409	13·4
1928	12	351	49	420	—	56	57	477	11·9
1929	18	483	109	632	50	89	139	771	18·0
1930	3	131	143	313	108	55	164	477	34·4
1931	4	75	57	161	50	4	54	215	24·8

¹ Up to and including 1922, Egypt is shewn as a British country.

Percentage of Total from Greece.										
Per cent.					Per cent.					
1919	76	1926 .. .. .	..	..	..	69
1920	65	1927 .. .. .	..	..	..	51
1921	60	1928 .. .. .	..	..	..	74
1922	68	1929 .. .. .	..	..	..	63
1923	51	1930 .. .. .	..	..	..	27
1924	67	1931 .. .. .	..	..	..	35
1925	45					

APPENDIX X.

Canadian Tariff : Wines.

In addition to the following duties, there are levied (a) a sales tax of 6 per cent. and (b) an excise tax of 3 per cent. of the duty paid value.

	British Preferential.	Inter- mediate.	General.	Australia.
Wines of all kinds, n.o.p. (including orange, lemon, strawberry, raspberry, elder and currant wines) : Containing 26° or less of proof spirit, whether in cask or in bottle per gallon	55 cents.	55 cents.	55 cents. plus 30% <i>ad. val.</i>	Containing more than 23° and less than 35°.
In addition, for each degree of strength in excess of 26° until the strength reaches 40°.	3 cents.	3 cents.	3 cents.	25 cents. per gallon.

Special Treaty rates applying to produce of France, Italy and a number of other countries.¹

Wines of all kinds, not sparkling, imported in cask or bottles :	Treaty rates per gallon.
(a) Containing 20° proof spirit or less	15 cents.
(b) .. more than 20° and less than 23°	20 ..
(c) 23° 26°	25 ..
(d) 26° until the strength reaches 40°.	55 ..

And, in addition, for each degree in excess of 26° until the strength reaches 40° 3 ..

¹ All Treaty rates expired on the 16th June, 1932, when the Canadian denunciation of the French Convention took effect.

Champagne and Sparkling Wines.

	British Preferential.	Inter- mediate.	General.	Treaty.	Aus- tralia.
Champagne and all other sparkling wines in bottles containing:					
(a) more than 1 pint, less than 1 quart, per dozen bottles ..	\$9.30	\$9.30	\$9.30 plus 30%	\$9.30 less 10%	\$7.44
(b) more than ½ pint, less than 1 pint per dozen bottles ..	\$4.65	\$4.65	\$4.65 plus 30%	\$4.65 less 10%	\$3.72
(c) ½ pint or less per dozen bottles ..	\$2.32	\$2.32	\$2.32 plus 30%	\$2.32 less 10%	\$1.86
(d) over one quart per gallon	\$4.50	\$4.50	\$4.50 plus 30%	\$4.50 less 10%	\$3.60

	British Preferential.	Inter- mediate.	General.	Treaty.
Medicinal or medicated wines, including vermouth and ginger wine containing not more than 40° of proof spirit	80%	80%	80%	70%

Countries which enjoyed the benefits of the French Treaty :

France	Italian Colonies and Possessions	Yugo-Slavia
Colombia	Argentina	Lithuania
Norway	Denmark	Rumania
Switzerland	Japan	Hungary
United Kingdom	Russia	Esthonia
Italy	Sweden	Spain
British Colonies and Possessions	Venezuela	Portugal
French Colonies, Possessions and Protectorates.	Finland	Czecho-Slovakia

Economic Union of Belgium and Luxembourg, Colonies and Possessions
The Netherlands, Netherlands Indies, Surinam and Curacao.

APPENDIX XI.

Empire Timbers suitable for Wine Casks.

(Note by the Department of Scientific and Industrial Research, London.)

A search through our Records had yielded comparatively little information concerning Empire timbers of proved suitability for wine casks, while enquiries have been made in other directions as well. The information is briefly summarised as follows :—

India.

From Summary of Uses and Availability in the book on Indian Timbers under preparation by R. S. Pearson and H. P. Brown.

1. *Grewia tiliacifolia* is described as having been passed as eminently suitable for liquor kegs by a firm of English manufacturers. Largest and best logs procurable from Coorg; estimated that 1,500 tons will be annually available.

2. *Grewia elastica*.—Troup states it is suitable for beer casks. Parker says that small supplies could be obtained from the Punjab: in the United Provinces it is more common, Kanjilal states it is very common in both the *Sal* and mixed forests of the Siwaliks and Ganges divisions and in the outer forests of Jannsar.

3. *Quercus dilatata*.—Cooper estimates that 5,000 cub. ft. could be procured annually from the Naimi Tal Division of the United Provinces. It has been thoroughly tested for casks and barrel making by the Government Wood Working Institute at Barielly, and found to be very suitable for the purpose.

4. *Artocarpus hirsuta*.—Fairly common on all West Coast Divisions but at present only exploited from the more accessible forests. Considerable quantities untouched in the more inaccessible evergreen forests: 16,000 cub. ft. annually available from the Urti Block of the Markut forests. Generally speaking, the present supply of this valuable timber is insufficient to meet the local demand.

Federated Malay States.

No timbers of suitable quality appear to be available, it is said there are plenty of woods strong enough, but usually they are highly coloured or contain soluble resins and oils.

British North Borneo.

There is no information meantime as to any timber being suitable.

New Zealand.

5. The woods mentioned here are :—

Southland beech (*Nothofagus menziesii*) and

Tawa (*Beilschmiedia tawa*).

References: "Our Forest Resources"—A. R. Entrican, and

"The Properties and Uses of Silver Beech"—W. C. Ward.

It might be well to suggest Kauri pine (*Agathis australis*).

Australia.

6. In Australia itself, although in Mr. E. H. F. Swain's book "The Timbers and Forest Products of Queensland", the timber known as Yellow-wood ash (*Flindersia Oxleyana*) is mentioned as being used in competition with imported oaks for the making of spirituous liquor casks, and stated to impart a faint taste; it seems fairly reasonable to assume that the Australian timber trade would of itself have examined and submitted local woods for use had they been proved entirely satisfactory.

Tasmanian oak (*Eucalyptus obliqua*), Blackwood (*Acacia melanoxylon*) and Mountain ash (*Eucalyptus regnans*) are said to be suitable for beer casks, but we have no information about their use for wine.

7. Should the New Zealand Kauri pine be considered, then also might be the Queensland Kauri (*Agathis Palmerstoni*) and possibly Hoop pine (*Araucaria Cunninghamii*).

Generally speaking, however, the softwoods do not seem to be favoured for wine casks.

Africa, British Honduras, British Guiana and the West Indies.

As yet I can learn of no suitable timbers from any of these British Oversea Possessions.

Canada and Great Britain.

8. British oak (*Quercus pedunculata*, or *Q. sessiliflora*) is suitable, and so is the white oak in Canada (*Quercus alba*), but in neither case does the supply meet the demand for other uses.

In general, we are told that oak is looked upon as the key wood in the wine trade since it imparts a character or mellowness which no other wood as yet used seems to do.

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Reports of the
Imperial Economic Committee

Twenty-Fourth Report

HEMP FIBRES

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Mr. Lewis Croome		(Assistant)

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Twenty-Fourth Report : Hemp Fibres

To the Right Honourable J. RAMSAY MACDONALD, M.P.,
Prime Minister of the United Kingdom.

To the Right Honourable R. B. BENNETT, K.C., M.P.,
Prime Minister of the Dominion of Canada.

To the Right Honourable J. A. LYONS, M.P.,
Prime Minister of the Commonwealth of Australia.

To the Right Honourable G. W. FORBES, M.P.,
Prime Minister of the Dominion of New Zealand.

To General the Honourable J. B. M. HERTZOG, M.P.,
Prime Minister of the Union of South Africa.

To EAMON DE VALERA, Esq., T.D.,
President of the Executive Council, Irish Free State.

To the Honourable F. C. ALDERDICE, M.H.A.,
Prime Minister of Newfoundland.

To the Honourable H. U. MOFFAT, C.M.G., M.L.A.,
Premier of Southern Rhodesia.

To the Right Honourable Sir SAMUEL J. G. HOARE, Bt., G.B.E.,
C.M.G., M.P.,
Secretary of State for India.

To the Right Honourable Sir PHILIP CUNLIFFE-LISTER, G.B.E.,
M.C., M.P.,
Secretary of State for the Colonies.

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REPORT

I. INTRODUCTION

We, the Imperial Economic Committee, appointed by the Governments of the United Kingdom, the Dominions, India and the Colonies and Protectorates, acting under a Resolution of the Imperial Conference of 1930, beg leave to present to the Governments of the Empire this our twenty-fourth report—*The Preparing for Market and Marketing of Hemp Fibres*.

2. We have examined a number of witnesses representing the producing, marketing and manufacturing interests, and we have further had the advantage of consultation with experienced officials both of the United Kingdom and oversea Governments. We thank them and all those who have appeared before us, or otherwise aided us in our enquiry, for their skilled assistance. In particular, we are indebted to two former members of our Committee—Sir Sydney Henn, K.B.E., and Sir Gilbert Grindle, K.C.M.G., C.B.—for serving on our Sub-Committee entrusted with the detailed work of this enquiry.

3. Besides the "true" hemp (*Cannabis sativa*) the name hemp is given in commerce to other fibres extracted either from the bast tissues of the stems or from the supporting tissues of the leaves of certain plants. In this report we deal with the fibres commercially known as hemsps, including therein manila, sisal, benequen, Indian (sunn), New Zealand and Mauritius hemsps. Scope of the enquiry.

II. THE USES OF HEMP

4. Hemp is one of the oldest of the textile fibres. It originated in temperate Asia, where it is still to be found growing wild; and, according to tradition, as early as the 28th century B.C. the Chinese Emperor, Shen Nung, was encouraging his people to grow the plant for its fibre. It was unknown in Western Europe before the Christian Era, and until the Middle Ages was cultivated principally for its seed, which was used as a food; but from Rabelais' panegyric, in which he maintains that "Pantagruelion" (i.e., hemp) is the most valuable of all "trees", it is clear that by the 16th century hemp fibre was put to a large number of uses; and in his view the only discovery at all comparable in importance which was left for future generations to make was that of the art of flying. Early uses of hemp.

5. The fibre was used for making clothes when wool and flax were the only alternatives. The early emigrants to America, wearing hempen homespuns, took the plant with them and introduced it to the New World. But its more important use was as cordage, to work the ingenious systems of pulleys by which an age innocent of steam power was learning to harness the winds and use every

ounce of human muscle to the best advantage. New possibilities in seamanship were opened up as the 15th century traders learned fresh arts of navigation and as "the Arctick people look'd upon the Antarctick, scoured the Atlantic Ocean, passed the Tropicks, pushed through the Torrid Zone, measured all the Zodiack, sported under the Equinoctial, having both Poles level with their Horizon" so hemp was more and more used, not only for ropes but also for canvas,—which word is indeed derived from the Greek word for hemp.

Decline in importance of hemp.

6. Within the last two centuries hemp has lost much of this predominance. Cotton has replaced it for wearing apparel and for most canvas; jute is now generally used for sacking; and other "hemp" fibres have been introduced for making cordage. As these supplies have emerged, the relative importance of true hemp has declined.

Sunn hemp.

7. Indian sunn hemp was probably the first of these other "hemp" fibres to be used in England. During the Napoleonic Wars, the vacillating policy of the Czar led the British users to seek some other source than Russia, then the chief supplier of hemp. Nevertheless at that time India could not supply a sufficient quantity; but it is of interest to note that the price of Bengal sunn in London was then about £66 a ton, while that obtained for Russian hemp ranged from £80 to £120 a ton. Exports from India increased gradually during the century, but never supplanted Russian hemp. The decline of Russian supplies since the 1917 Revolution gave a new opportunity, and in a memorandum prepared by the Imperial Institute and issued by the Empire Marketing Board in 1930, it is stated that "sunn hemp may now perhaps secure for itself a sound position as against Russian hemp, a chance which it never had before and may never have again".*

Manila hemp.

8. The substitute for true hemp which has been most widely adopted in the manufacture of cordage is manila hemp or abaca. Although its properties had long been known to the natives of the Philippine Islands and although an Englishman living there had written an account of it in 1686, the total export of manila had only reached a few thousand tons a year by the beginning of the 19th century. The Crimean War gave a big stimulus to production and export and now manila, of which almost the whole supply comes from the Philippine Islands, is the most important cordage fibre entering into international trade.

New Zealand hemp.

9. Another rival, especially in the making of twines, was phormium fibre, the use of which by the Maoris was described by Captain Cook in his Journal in 1770. Woven specimens brought by him to England are still exhibited at the Imperial Institute. The fibre, as selected and prepared by the natives, was so fine that early

* Indian (Sunn or Sann) Hemp. E.M.B. No. 25. February, 1930.

exports went under the name of New Zealand flax. With the growth of the trade and the entry into it of traders and settlers, the original high standards fell off and the later coarser product, although still called flax in New Zealand and St. Helena, has, since 1871, been known to merchants in London as New Zealand hemp.

10. Henequen or sisal first entered the field in 1839—its more Sisal. widely known name being derived from the port of Sisal in Mexico, whence the first shipments were sent. Costs of preparation were high until a machine was invented to extract the fibre. When this difficulty was overcome, an important outlet for this fibre was provided by the increasing use of self-binding harvesters on the expanding wheatfields of North America, for sisal is particularly suitable for binder twine. At first Mexico, where the plant was indigenous, held a monopoly of the supply. With the introduction of sisal into East Africa and the Netherlands East Indies at the beginning of this century, that monopoly has been challenged and the relative importance of the Mexican crop has since declined. In recent years Mexico has supplied less than half the total quantity entering into international trade.

11. Although the variety of hemp fibres available is greater than Importance
of
cheapness. in the days of Rabelais, their use is now practically limited to the manufacture of rope, twine and nets. These articles serve the incidental needs of industry, agriculture and the distributive trades—as in the mooring of ships and boats, the binding of sheaves and the tying of parcels. The cost of the ropes and twine used in a particular industry or trade may or may not be high relative to its other costs; but none the less the use to which the rope or twine is put does not—except in fishing—serve the main purpose of the industry or trade. In these circumstances, cheapness is the chief, practically the sole consideration, provided the qualities of strength, durability and flexibility are present to the degree required in each case. Some of the hemp fibres now in commercial use have qualities which make them pre-eminently suitable for particular cordage purposes, but commonly the fibres are interchangeable; and it follows that, subject to certain reservations, price largely determines the choice of the manufacturer. Also, cordage users are, sooner rather than later, induced by differences in price to use ropes and twines made of materials other than those which they have been accustomed to buy. The fibre producer is therefore concerned not only with the volume of production and the fluctuations in the price of his own particular fibre, but also with the development and prices of other competing fibres. He is also subject in most cases to another uncertainty—the risk of the development of another vegetable fibre possessing similar qualities and equally cheap. For these reasons, cheapness in cost of production—including therein the suitable location of plantations and their efficient management—is peculiarly important to the commercial success of fibre growers.

III. THE PRESENT IMPORTANCE OF MANILA HEMP

Principal
fibre for
marine
cordage.

12. Marine cordage forms a large part of the total world output of cordage; and at present most users believe that for this class of rope manila hemp is the only entirely satisfactory fibre. The production of this fibre is large and its almost complete monopoly of the market for marine cordage is the principal factor restricting the openings available for the other hemp fibres.

Changes
in
production.

13. Manila hemp or abaca was, until recently, confined to the Philippine Islands and though an increasing amount, estimated at about 10,000 tons a year, is being prepared in Sumatra, this remains small compared with the Philippine production. Since 1913 the area under manila hemp in the Philippine Islands has slowly expanded. The yield per acre in recent years has also been somewhat larger than in 1913 but there is reason to suppose that this is primarily due to an increase in the production of the coarser grades. The yield of "excellently cleaned fibre" from the freshly cut stalk is only $1\frac{1}{2}$ per cent. of the weight of the raw material compared with 2 per cent. of "coarsely cleaned".

Preparation
of the
fibre.

14. The fibre is obtained from the plant *Musa textilis*, which, though a member of the banana family, is more particular in regard to climate and soil than the ordinary banana plant. The fruit is inedible and the commercial value of the plant lies in its fibre. The lower portions of the leaves wrap tightly round the real stem, making a trunk or what is known botanically as a "pseudo-stem", which when fully grown may be nine inches in diameter and up to 20 feet high. When two or three years old, the whole trunk is cut down just before flowering; but since the plants put out suckers freely, there may be as many as twenty trunks to each clump, and the same area can be cut over every six or eight months. Although the better practice is to re-plant after twelve years, cutting may be prolonged up to twenty.

15. Until the last twenty-five years the production of manila hemp in the Philippine Islands has been entirely in the hands of the small holders. These producers follow the old methods of planting, exercising little care in the choice of the suckers and using no fertilisers; while they prepare the fibre by methods which have altered very little since the first export a century and a quarter ago.

After the trunk is cut, the outer layer of the leaf sheath, which contains the fibre, is removed by hand in "ribbons" a few inches wide—a process which involves much labour and waste of fibre. These "tuxies", as they are called, are then drawn between a plain or serrated knife and a smooth block of hard wood. This work is so strenuous that it can only be done by an able-bodied man, yet it is estimated that he can produce only 20 to 25 lbs. of fibre a day. The only machine at all widely used is a revolving spindle, to which the fibre is attached and which helps to pull the

" tuxy " past the knife. It was not until 1924 that any experiments were made with radically different methods of stripping the fibre. Trials are being made with sisal decorticators adapted to deal with manila; so far they have not been regarded as entirely satisfactory and only about a half of one per cent. of the output in the Philippines is prepared in this way. In contrast with this the decorticator is regularly used in Sumatra for the production of manila hemp.

16. Many improvements have, however, been developed in the Philippines—particularly in the province of Davao in South Mindanao where, within the last 25 years, large plantations have been taken over by United States and Japanese interests. On these estates sisal decorticators are being tried; and experiments are being made with fertilizers and with new systems of planting. Until 1931, the fibre from this district secured a premium over that from other provinces, and production has expanded so rapidly in the last 15 years that nearly one-half of the total increase in the Philippine acreage has taken place in Davao. It now produces more than one-third of the total output of the Philippine Islands and there is ample opportunity for further expansion. It is difficult to estimate whether any further development in Davao would be at the expense of the other Philippine producers, or whether it would add to world supplies. It is felt that if the other Philippine producers are slow to take advantage of the improved technique they may be gradually eliminated.

Develop-
ments in
Davao.

17. As the following table shows, most of the fibre produced is exported; though a certain amount is retained for a local rope-making industry, which exports a small but increasing amount of cordage. The principal market for the finer grades (a) of fibre is found in the United States, which takes from 30 to 35 per cent. of the total quantity exported. The United Kingdom and Japan each take 20 to 25 per cent. of the total and draw their supplies from the medium and lower grades respectively.

Production
and exports.

*Acreage, Production and Exports of Manila Hemp of the
Philippine Islands*
(in thousands)

Year	Acreage	Production	Exports
		tons	tons
1913	1,081	138.8	117.9
1925	1,181	177.6	148.6
1928	1,188	175.9	172.0
1929	1,198	210.0	186.4
1930	1,226	192.3	166.6
1931 (b)	—	137.3	130.0

(a) For a list of the grades of manila hemp, see Appendix E.
(b) Provisional figures.

Tests of
Empire
fibres for
marine
cordage.

18. Within the British Empire, there is a very small production of manila hemp in British North Borneo, and small quantities of fibre have been prepared in some of the Pacific Islands and in Burma; but there is no prospect of the Empire becoming self-sufficient. Trials of the suitability for marine cordage of other Empire fibres—sisal, New Zealand, Indian sunn and Mauritius hems—are, however, being made. In 1925, the Imperial Institute, under the auspices of its Advisory Committee on Vegetable Fibres, began a series of experiments "to determine the effect of sea-water on the strength and durability of sisal hemp in comparison with manila". Three series of trials have been completed and the results published.* The first series was carried out with 3-inch ropes of First Quality East African sisal, Unbrushed Superior No. 2 East African sisal and "J" grade manila. The ropes, all made by the same manufacturer, were put in wooden crates, which were fixed to Southend Pier in such a position that they were completely submerged and uncovered at each tide. The breaking strain was determined after 4, 6, 9 and 12 months' immersion in sea-water and comparisons were made of the swelling of the ropes and the buoyancy of the fibres. In the second series, tests were made with 1½-inch and 3-inch ropes of sisal, manila and henequen, all manufactured to a single specification. Not only were the ropes submitted to continual immersion as in the first series, but lengths were also dried by exposure to the air for a period and then tested after re-immersion in sea-water. In the third series, eleven 3-inch ropes of sisal, manila, Russian, Indian sunn and New Zealand hems, made after the same specifications as in the previous series, were exposed to tidal action. In the last two series, breaking strains were tested after exposure for periods of from one to twelve months. Concurrently with these trials, the Admiralty carried out similar tests on sisal, New Zealand and manila hemp ropes, which had been made in the Admiralty rope works.

19. As a result of these tests, it has been definitely established that East African sisal, New Zealand hemp and Indian sunn hemp are all capable of resisting the action of sea-water. The Admiralty trials showed that a rope made of No. 1 East African sisal not only had a much better appearance than a rope made of J grade manila—a higher grade than is often used for marine cordage—but had also a greater initial breaking strain and "compared favourably with manila when exposed under service conditions". There are, however, certain objections to the use of sisal; for it (i) absorbs water more quickly than manila—therefore weighing more—and sinks more rapidly, (ii) swells more, (iii) shrinks in length at a quicker rate and (iv) when dry does not return to its approximate original size like manila. However, despite these objections, the results were such as to justify large scale trials under service conditions,

* "Empire Fibres for Marine Cordage. African Sisal, New Zealand Hemp and Indian Sunn." Report of Investigations conducted by the Imperial Institute, 1931.

and two hundred and forty coils of rope, of various sizes up to 5 inches circumference, have been distributed to the Fleets in all parts of the world for use as boats' falls, etc. Reports on this rope should be available in the autumn of 1932 and will particularly note how it compares with manila in flexibility and ease of handling, and whether swelling or mildew cause any trouble.

At the same time, the Admiralty is carrying out further trials with New Zealand hemp of High Point Fair grade—the best of the three grades used in the first tests. The initial breaking strain of the New Zealand hemp so far tested has not been so high as that of manila and while its colour is similar, the fibre is coarser. It absorbs water at a greater rate than manila and sinks more rapidly, though rather better than sisal in both these respects; further, it swells more than manila and remains swollen when dried.

Between 1927 and 1930, the Admiralty carried out trials of tarred cordage made from Indian hemp. Further trials have been deferred pending improvements in the production, grading and marketing of the fibre; and its use by the Admiralty is restricted to spun-yarn. The resistance of Indian sunn hemp to sea-water has been tested by the Imperial Institute. In this quality, it compared very favourably with Russian hemp (dressed Siretz), of which a small amount is used for marine purposes.

To sum up: while sisal may surpass manila in strength and appearance and compares favourably in durability, it is inferior in retaining its buoyancy, size and shape after immersion. Whether sisal or any of the other Empire hemps is widely adopted is likely to depend, therefore, on the importance attached to these latter qualities.

20. We have already pointed out that the present dependence on manila for marine cordage only dates from the middle of the last century; before that the bulk of marine cordage was made of soft hemp. When the safety of lives may depend on the strength and ease of handling of the ship's ropes, the standards demanded by the Board of Trade's regulations are necessarily high, and users are naturally reluctant to change from a known to a comparatively unknown article. Producers of Empire fibres are therefore confronted with the difficult problem of a foreign competitor entrenched in one of the chief potential markets for their product. As we have shown, that position is not unassailable. Further, the publication of the results of the Imperial Institute and Admiralty tests and the publicity given by the Empire Marketing Board to the possibilities of sisal for marine cordage, stimulated interest in the problem among British shipping companies.

Position of
manila not
unassailable.

21. Whether any Empire fibre is used for marine cordage must depend on its fitness for the purposes to which it is put. Should any of them be found suitable in practice, we believe that Empire users will voluntarily prefer to use an Empire product, but we expect their wide adoption to be a slow process. This is especially likely outside the Empire, for unless the supply expands to meet

the new demand, the use of sisal or any other Empire fibre for marine cordage must tend to raise its price relative to that of manila, since, apart from the effects of the present depression, we see no likelihood of a falling off in manila production.

22. Outside the market for marine cordage, manila has been losing ground. There has been a gradual decline and deterioration in the quality of the manila hemp prepared by the smaller producers, so that, for a number of its minor uses, such as twines and cords and some kinds of small rope, it has been unable to compete with the increasing supplies of well cleaned sisal which have been coming from East Africa and the Netherland East Indies. This sisal has also provoked an improvement in the preparation of Mexican henequen, and hence has increased the competition met by manila hemp from that fibre as well. Combined with the prospect of the production of manila hemp in other areas where temperatures and humidity are sufficiently high, the competition of sisal has shown the Philippine authorities that prohibitions on the export of manila plants are insufficient to safeguard the local industry, and has stimulated efforts to improve current methods of preparation. In a Bulletin recently issued by the Fibre Standardisation Board of the Philippines, a series of suggestions for reform are put forward, which include a simplification of the grading and, in order to assist this, standardisation of the "stripping knives". A number of reforms in agricultural practice and the development of automatic or semi-automatic machinery, such as the decorticator, are also urged.

The present position.

23. The present position is therefore that the exclusive use of manila in the manufacture of marine cordage is being challenged, but that manila is certain to remain the dominant fibre for some time longer in this limited but very important market. Consequently it is in the manufacture of twines, cords and small ropes that the immediate outlet for the Empire hemp fibres most clearly lies. The rest of this report is confined to a consideration of the use of Empire fibres for these purposes, especially in Empire markets. Here again, to an unknown but certainly limited extent, manila is a competitive fibre. As we indicated in the previous paragraph, it has in this field recently lost ground to sisal. The proportions of the manila supply which are used for marine cordage and for other purposes cannot be estimated; therefore, while its competition should not be forgotten, we have excluded it from further consideration.

IV. PRODUCTION OF HEMP IN EMPIRE COUNTRIES

Empire sources of hemp.

24. In only two countries of the British Commonwealth—New Zealand and India—are commercial hems indigenous. The *Phormium tenax* of New Zealand—yielding a hard fibre and in that respect in the same category as manila and sisal—grows wild in

some of the swamps and output can be rapidly increased or curtailed according to fluctuations in market prices. Indian hemp—yielding a soft fibre and in that respect in the category of true hemp—is cultivated chiefly for local use, and the quantities exported form but a small portion of the total production.

Elsewhere in the Empire—in East Africa, in the Bahamas, in Jamaica, in Mauritius and in St. Helena—fibre plants have been introduced, often with the definite object of founding new export trades. A high measure of success has followed these efforts, practically all of which have been made within the last fifty years, whilst the most important of them, that of East Africa, belongs really to the present century. In each year from 1927 onwards the total exports of fibre from these new developments have exceeded the combined exports from New Zealand and India. The plants most generally introduced have been varieties of sisal, which is now the most important fibre of hemp character grown in the British Empire—so far as international trade is concerned.

25. Exact figures of the quantities of different hems entering international trade are difficult to compile, largely because no distinction is made between different fibres in the returns of many countries. But an examination of the returns of the different countries and of the tables published by the International Institute of Agriculture at Rome show that on the average of the two years 1928 and 1929 some 606,000 tons of hemp entered into international trade. Of this amount nearly one quarter were soft hems (bast fibres) and three-quarters hard hems (leaf fibres). This proportion shows approximately the greater importance of the hard fibres in international trade. Judged by values their relative importance is somewhat less than this, their value per ton being usually lower.

26. The share of Empire countries in 1928 and 1929 in each of these two large sections of international trade in hemp was approximately from 17 to 18 per cent.

Exports of hemp fibres (Average of 1928 and 1929)

	World trade	Quantity from Empire countries	Percentage from Empire countries	Chief foreign sources
Leaf (hard) Fibres	Thousand tons 465.3	Thousand tons 78.5	16.9	Thousand tons Philippines (179), Mexico (126) and Netherlands East Indies (55)
Bast (soft) Fibres	140.7	24.9	17.7	Italy (66), Lithu- ania (13)

The total exports of different kinds of fibre from Empire countries during each of the last six years is as follows. The most noticeable features are the increase in the exports of sisal and the decrease in those of phormium and Indian fibres.

Exports from countries of the British Empire

	1925	1926	1927	1928	1929	1930
	Figures in thousand tons					
Sisal	36.3	43.3	51.0	55.2	64.1	67.9
Phormium fibre	21.2	22.0	20.7	16.9	16.1	10.4
Mauritius hemp	1.9	2.5	1.9	2.5	2.4	1.4
Indian hemp	33.8	23.8	25.6	25.7	24.6	17.8
Total	93.2	91.6	99.2	100.3	107.2	97.5

(A) SISAL

Agave fibres.

27. Sisal, henequen and maguey or cantala are prepared from the leaves of various species of *Agave*. The fibre, which varies in length from 2½ to 5 feet, is nearly white or pale yellow and, though very strong, it is harder and less flexible than manila. It is principally used for making binder twine, but improvements in spinning the fibre have increased its use for manufacturing polished twines. It is also being more widely used for small ropes and has been woven into sacking and bags.

28. In Mexico, where the *Agave* is indigenous, seven species are utilised for fibre production, but only three are at all widely cultivated.

(i) The *Agave fourcroydes* is the variety from which most "henequen" or Mexican sisal is prepared.

(ii) The *Agave sisalana* is the source of commercial "sisal" and is grown chiefly in East Africa and the Netherlands East Indies, but also in Mexico, the West Indies, Mauritius and the Philippine Islands (in the last two on a small scale only).

(iii) The *Agave Cantala*, which is of lesser importance, is a peasant crop in the Philippine Islands where the fibre is known as "maguey". It is also grown on small estates in the Netherlands East Indies, the fibre being called "cantala".

Of these varieties, the first two are the most important, but the *Agave fourcroydes* is practically confined to Central America. Outside Mexico it seems likely that most of the sisal plants (*Agave sisalana*) in the world originated from a few plants which were taken to Florida in 1836; but the development, which has taken place entirely within this century, has been very rapid. Until 1916,

the Mexican production was about 90 per cent. of the total world output of *Agave* fibre. In 1931, it was probably less than one third of the world total and would still have been much less than a half even if the output had not been curtailed, in accordance with the policy of restricting production during that year.

29. The outstanding feature of the following table, which summarises the figures of the exports of sisal, henequen and maguey given in Table 2 of Appendix A, is the growing importance of Empire countries in this trade. Exports from Empire countries increased by 87 per cent. between 1925 and 1930; while, over the same period, exports from other producing countries showed little change. (If due allowance could be made for the inclusion in these figures of the manila hemp exports from the Netherlands East Indies, it is likely that the exports from foreign countries of *Agave* fibre alone would be found to have been about the same in 1929 as in 1925.)

World Exports of Agave Fibres (Sisal, Henequen and Maguey), 1925-9

(thousand tons)

	1925	1926	1927	1928	1929	1930
British countries	36.3	43.3	51.0	55.2	64.1	67.9
Other countries	133.6	167.4	195.4	214.6	200.9	151.9
Total	229.9	210.7	246.4	269.8	265.0	219.8

30. The advance in harvesting methods, brought about by the invention of the self-binding harvester which both cut and tied the sheaves of corn, not only opened vast areas for wheat cultivation but created a new use for twine. Sisal, which finds its chief market here, has for a long time been the principal fibre for making binder twine. How large is the present consumption of this twine may be gauged from the manufacture in the United States in 1925 of over 104,000 tons—chiefly from sisal and henequen—and in 1929, of nearly 80,000 tons, while in Canada, the production of binder twine amounted to 36,000 tons in 1929 and 26,600 tons in 1930. These figures may be compared with the total production of 58,000 tons of all kinds of hemp ropes, cord, twine and string in Great Britain in 1930.

31. Another change is in progress: in the principal wheat-producing countries the self-binding reaper is giving place to the Combined Harvester-Thresher. As the horses or, more generally, the tractor goes round the fields drawing this machine, which is essentially the knife and platform canvas part of a binder attached to a threshing machine, it cuts and threshes in one operation so that no

twine is needed. In our report on the "Wheat Situation in 1931" (a), we referred to the rapid increase in the use of this machine. In Kansas, which produces one-fifth of the United States wheat crop, the number of combines increased from 3,282 in 1925 to about 25,000 in 1930. "In the course of some 600 miles of motoring in the State (Kansas), the acreage seen that had been cut with binders was negligible" (b). In Western Canada, an official estimate shows that while only 5 combines were being used in 1924, by 1929 there were 7,255 in use. "Combine-harvesting is now the accepted method of harvesting in all the big wheat-growing districts, both in Canada and the United States of America" (b). In Australia, the combine or its equivalent is now "universally used" (c), and in Argentina, over 30 per cent. of the total wheat area is harvested by the combine (d). Nor is the use of the combine limited to these countries. Russia is already using it. Given efficient grain drying machinery, if only for emergency use, the Ministry of Agriculture Bulletin already referred to (b) expresses the opinion that "with the use of the smaller machines now being developed or with ordinary-sized machines on the larger farms, and the means of saving the straw now available, the combine has a future in England". In many European countries, however, the introduction of these machines is likely to be checked by the fact that their agriculture is based on a peasant system.

32. We would draw the attention of sisal producers to the important effect which this change in agricultural practice must have on the demand for sisal. We envisage a narrowing market for binder twine and the absorption of the supply of sisal must depend on its extended use for commercial twines, ropes and other purposes. The recent increase in exports and the progressively lower prices for which sisal has been sold cannot, however, be taken as a necessary indication that production has already outrun the normal demand.

33. Sisal production has been carried on in many parts of the Empire, but only in a few has it developed on any considerable scale or lasted for many years. British East Africa—Tanganyika, Kenya and Nyasaland—is much the most important Empire producer and the whole of the recent increase in Empire production has taken place in this area. Outside East Africa, only the Bahamas and Jamaica have produced appreciable quantities of this fibre in recent years.

(a) 20th Report, Section XI.

(b) "Agricultural Machinery in Canada and the United States of America." Ministry of Agriculture Bulletin No. 27, 1931.

(c) *Agricultural Machinery and the Organization of Agricultural Labour in Australia, New Zealand and Canada*, by Amos and Garton. Ministry of Agriculture, 1929.

(d) *International Labour Review*. March, 1931.

(i) BRITISH EAST AFRICA

34. In 1893, the German East Africa Company imported from Florida a thousand young plants into what is now Tanganyika Territory. Only sixty-two plants survived the voyage but development was rapid. Exports on a large scale began in 1902 and in 1913 reached 20,800 tons. Most of the estates were abandoned during the East African campaign, and though leased from the Custodian of Enemy Property when the country was occupied they were not put in proper order again until they were sold after the war. Then production rapidly made up leeway, and by 1926 exports exceeded the pre-war total. The production of sisal in Kenya has developed entirely within this century, the first planting having taken place about 1907 in the Nairobi district. Development went on during the war, but as many estate owners and their staffs were engaged in the East African campaign, it was probably less rapid than it would otherwise have been. Planting was begun in Nyasaland in about 1914 and expansion went on up to 1931, when, owing to the economic depression, production was curtailed.

Early
develop-
ment.

35. The plantations in Tanganyika are chiefly on the coast or along the railways within a short distance of the ports of Tanga, Dar-es-Salaam and Lindi. In this coastal belt there are large areas suitable for hardly any other form of development. In contrast with this, planting in Kenya has chiefly been done in the highland area and most of the estates are over 300 miles from the coast. Since ample labour and food supplies are available locally and it is not necessary for the white staff to take as frequent European leave as in Tanganyika, the Kenya estates have certain advantages; but they are under competitive disadvantages in that they have to pay more for the transport of stores and of their finished product because of their distance from the coast. Unless their advantages counterbalance their disadvantages in the matter of transport, the up-country estates must almost inevitably be the first to feel the effects of a severe fall in prices. Similarly, the estates in Nyasaland, which are chiefly in the Lower Shiré district and whose transport costs are high, were among the first to cease production during the present depression.

Location of
plantations.

36. The world depression has drawn particular attention to the present organization of the East African sisal industry. About one-half of the total output comes from the estates of comparatively strong companies, some of which control several large estates. These organisations carefully watch expenditure and because of their size are able to reduce the proportion of some of their overheads to their total costs. In several cases, there is a close link between the producing company and a London merchant. Although sisal growing is probably more adapted to company than to individual organisation, because of the waiting period between planting and production, the remaining output is controlled by individual settlers, many of them administering private companies.

Organisation
and control
of the
industry.

Burden of indebtedness.

37. The "economic blizzard" caught the sisal industry in East Africa during a period of rapid expansion and before it had attained the stability associated with a long established industry. Indebtedness is common to most of the producing companies. It has been estimated that the loans outstanding on sisal estates in East Africa at the end of 1931 amounted to one million sterling. Large bank loans are a normal feature; the company raises a loan on its crop and often this becomes a permanent charge on the estate. In some cases debenture issues have been made. Many settlers began on small estates without a proper programme of development and, without these loans, could not have extended their estates up to the size which their unit of machinery made necessary for efficient working. The loans used to extend cultivation in the years when prices were high and prospects rosy are now proving a very serious burden to planters. During 1931, exports on consignment were on a larger scale than usual. Most of this weak selling was done by producers who had pushed their production to the maximum in order to cover their overhead costs.

The case for Government assistance has been put forward strongly. In February, 1931, a Committee of Enquiry into the then existing conditions in the Kenya industry found that if assistance were not forthcoming at an early date, "there is considerable danger that many estates will be compelled to close down completely". They recommended that advances should be made to producing estates in order to secure maintenance and rotational planting. The recommendations were given most careful consideration but the Government of Kenya found it impossible for financial reasons to provide the assistance sought. It is unnecessary to draw from this the obvious lesson that producers of sisal, as of other semi-permanent crops, must make ample reserves in times of prosperity against the time of depression. Further, it is clear that sisal production should not be commenced without a definite scheme of development and adequate finance.

Acreage and exports.

38. Development in recent years is shown by the following figures of acreage and exports.

(a) *Area under Sisal in British East Africa*
(thousand acres)

Year	Tanganyika	Kenya	Nyasaland	Total
1925	124.0	52.9	4.8	181.7
1926	168.0	60.2	6.2	234.4
1927	161.7	71.2	6.3	239.2
1928	166.8	91.9	7.9	266.6
1929	229.0	109.1	8.3	346.7
1930	197.4	138.0	9.3	344.7

(b) *Exports of Sisal from British East Africa*
(thousand tons)

Year	Tanganyika	Kenya	Nyasaland	Total
1925	18.3	14.4	.8	33.5
1926	25.0	14.7	.5	40.2
1927	33.0	15.3	.8	49.1
1928	36.2	16.5	1.2	53.9
1929	45.7	15.6	1.2	62.5
1930	50.0	15.9	1.3	67.2
1931	55.9	16.0	.2	72.1

The chief markets for East African sisal cannot be determined from the local Trade Returns: most of the bills of lading are now made out with Antwerp as the first option on account of the cheaper storage at that port, and the fibre is landed there if it is unsold on its arrival in Europe. As a result of this, Belgium now appears as the chief importer of East African sisal in the trade returns of Kenya and Tanganyika, whereas most of the product is merely consigned to that country, awaiting a market. Nor, until 1931, did the Belgian returns show how much sisal was landed there, so that there is no satisfactory check on the East African figures. With the grant of preference in the United Kingdom, a change in this practice may occur.

(ii) BAHAMAS

39. Sisal had been acclimatised in the Bahamas for many years, but it was not until 1885 that attention was drawn to the possibility of developing a fibre industry. The Annual Report on the Colony for 1888 stated that there was a big demand for land for sisal growing and that money was being invested by outside capitalists. Sir Ambrose Shea, then Governor of the Colony, predicted an astounding future for the industry. Extensive areas were cleared, mainly of the "black soils"—the most fertile lands in the islands—and by 1890, 100,000 acres were said to be devoted to sisal, though it is doubtful whether the whole of this area was ever planted. Two years later, the first shipments were made. The prices realised were satisfactory and prospects seemed good; the plant had been found to survive hurricanes and those who could not afford machinery were able to prepare the fibre by retting the leaves in salt water. It was felt that "the blessing of the industry had been brought home to the humblest peasant in the Colony". However, expectations were not realised; the industry nearly collapsed with the fall of prices in 1897, but recovered sharply in the next year. In 1906 only 25,000 acres were under sisal, nevertheless the value of the fibre exports increased up to 1907.* A fresh increase which came

Position of
the industry.

* As prices rose between 1897 and 1907, there was a closely parallel increase to a record level in the exports of phormium fibre from New Zealand.

after 1912 was continued during the war, so that in 1917 sisal exports were worth £182,000. From this time the industry began to export less and less and during the last six years, the decline has been especially severe.

Acreege under Sisal and Export of Fibre from the Bahamas
(in thousands)

Year	Acres	Tons
1925	(a)	2.3
1926	14.7	1.7
1927	13.9	.6
1928	14.2	.9
1929	7.0	.9
1930	5.9	.3
1931	(a)	.02

(a) Not available

(iii) JAMAICA

A new industry.

40. The *Agave* has been grown in Jamaica for about eighty years. It is known that henequen was introduced from Yucatan about 1850, and at least two attempts were made during the last century to start a fibre industry. A pamphlet on "Sisal Hemp, its Adaptation to Jamaica", written by D. J. Stoddart, was published locally in 1886, and in the same year sisal was introduced from the Caicos Islands, where it had been taken from the Bahamas. But the plants "poled" in two years, before they were ready for cutting. A new attempt with plants introduced from Florida was made in 1891, but the low fibre prices ruling at that time checked this new industry. Recent development dates from the establishment in 1917 of a Government plantation of about 1,000 acres. This was organised so that land-holders in the district might grow sisal and sell the leaves to the central decorticating factory for $1\frac{1}{2}$ per cent. of the f.o.b. price of sisal at Kingston, Jamaica, with a bonus share in half of the profits at the end of the year. A certain amount of planting was done by local land-holders and in 1922 the factory started production. Both the Government factory and plantation were leased out in 1927. Other plantations and factories have since been started in the parish of Clarendon.

As a further stimulus to the new industry, and to encourage the local manufacture of sisal cordage, in 1927 a tariff was put on the import of sisal cordage.

Acreage and Exports of Sisal from Jamaica, 1925-31

Year	Acres(b) at March 31st	Exports tons
1925	2,491	239
1926	2,197	294
1927	370	188
1928	1,942	344
1929	(a)	422
1930	1,447	74
1931	8,681	(a)

(a) Not available

(b) These figures must be regarded as only approximate.

(B) NEW ZEALAND HEMP

41. New Zealand was for a long time the principal Empire source of hard hemp fibre, but the growth of sisal production in East Africa has deprived it of this position. In appearance, New Zealand hemp is very similar to manila: it is long, lustrous and, if carefully prepared, flexible, while the colour varies from nearly white to a pale reddish brown. *Phormium tenax*, from the leaves of which the fibre is prepared, is indigenous to New Zealand and Norfolk Island. Large plantations have been laid out in South America, and during the last two years attempts have been made to cultivate the plant in the Isle of Man. Attempts at its commercial exploitation have also been made or are in progress in Natal and Zululand. No fibre has as yet been produced from these experiments, and at present all the phormium fibre entering into international trade comes from Empire sources. It is possible that where local conditions in the Empire are favourable—climate, transport and labour—the planting of high yielding strains may prove profitable.

Production confined to Empire countries.

(i) NEW ZEALAND

42. In New Zealand, where production is centred chiefly in the North Island in the "land districts" of Auckland and Wellington and in the South Island in the coastal district of Westland, the leaf was originally cut from the swamps where the plants grew wild. In those days the leaf cutters moved from one district to another, paying a royalty to the swamp owners for the right to cut the leaves and clean the fibre. At the beginning of this century, it was generally realised that a better yield could be secured by draining the swamps, and now many millers own a sufficient area to supply their needs; though some still secure their supplies by paying a royalty to other swamp owners.

Area of production.

Acreage and Production of Phormium tenax in New Zealand
(in thousands)

Year	Acres (a)	Production (tons) (b)			
		Fibre	Tow	Stripper-slips and stripper- tow	Total.
1925	54.8	14.9	2.7	(c)	17.6
1926	57.8	17.1	4.7	(c)	21.8
1927	69.4	15.8	3.1	(c)	18.9
1928	66.5	14.3	2.6	0.9	17.8
1929	62.7	11.7	2.3	0.8	14.8
1930	68.3	11.7	2.4	0.8	14.9
1931	91.2	2.0	0.5	0.1	2.6

(a) From figures at a census taken at the beginning of every year.

(b) For years ending March 31st.

(c) Included under tow.

Production
elastic.

43. Recently the world depression has made it unprofitable to prepare the fibre and the majority of the mills have stopped working, so that production is now lower than it has been since the late nineties of last century. This does not mean, however, that future recovery is ruled out, for the industry has been marked by wide variations in output. Adjustments to price changes can be made very easily. Unlike sisal, if production is unprofitable phormium can be left to grow for some years and no harm is done; in fact the growth of the plant is likely to be improved. Some areas are, however, being converted into grazing land because of the uncertainty of reasonable royalties being received. Further, few of the "millers" depend solely on fibre production for their living. The following examples illustrate the degree of elasticity in the supply. In 1907, the average price per ton was just over £29, and the export of fibre was the record one of 28,500 tons. In the following year the average price had fallen to £22 15s. per ton and the export was only 17,400 tons. For the next four years the price was low, but in 1913 it rose to £25 15s., and again over 28,000 tons were exported. The same effect was shown in the first post-war depression when there was a sharp decline in exports and a subsequent recovery as prices rose and costs were adjusted. In the present depression the production in 1931 was less than one-fifth of that in the previous year. It may be expected that when prices recover production will once more increase and the probable increase in supply with any rise in prices must be borne in mind by producers of competitive fibres.

44. The New Zealand rope and twine makers use only between one and two thousand tons of the fibre a year, and the rest is exported principally to the United States, the United Kingdom and Australia. Exports.

Exports of phormium fibre from New Zealand
(in thousand tons)

Year	Fibre	Tow	Total
1925	16.4	3.4	19.8
1926	17.2	3.6	20.8
1927	16.2	3.4	19.6
1928	12.9	2.8	15.7
1929	12.3	2.4	14.7
1930	8.0	1.5	9.5
1931	1.8	.6	2.4

(ii) ST. HELENA

45. *Phormium tenax* was introduced into St. Helena about fifty years ago. In 1906-7, when the withdrawal of the garrison threw many of the islanders out of employment, a small mill to extract fibre was erected with the aid of a grant of £5,000 from the Government of the United Kingdom. Further planting was undertaken, but the production of fibre remained small until the high prices obtainable during the war stimulated development. In 1913, the exports of fibre and tow amounted only to 170 tons. Twelve years after the war, preparation of the fibre had become the island's principal industry and about 2,000 acres—that is one-fifth of the cultivable area of the island—is now under phormium. Most of the acreage is controlled by the two or three mill-owners but the Government has leased land to small-holders, who grow and cut the leaf and sell it to the millers. In spite of the fall in prices, production was maintained up to the end of 1931, but by April 1932 all the mills had closed. Nearly all the fibre exported is sent to the United Kingdom, but a small amount usually goes to the Union of South Africa. Position of the industry.

Exports of phormium fibre from St. Helena
(in hundred tons)

Year	Fibre	Tow	Total
1925	9.2	4.2	13.4
1926	7.5	4.2	11.7
1927	7.4	3.7	11.1
1928	7.7	3.8	11.5
1929	8.9	5.1	14.0
1930	5.4	3.4	8.8
1931	6.4	3.0	9.4

Exports of
cordage.

46. An attempt has recently been made to establish a cordage industry, but the local demand is small and an export trade is difficult. In supplying export needs the industry is handicapped by conditions of transport (a ship visits the island only once a month) by dependence on only one fibre and by difficulties in establishing contact with potential purchasers. In the last five or six years the total annual exports of cordage have exceeded fifty tons in two years only.

(C) MAURITIUS HEMP

Develop-
ment of the
industry.

47. Mauritius hemp is obtained from varieties of *Furcraea gigantea* which are generally known in Mauritius as "aloes". The plant was originally brought from Central America as an ornamental garden plant and the industry of preparing fibre from the leaves has gradually developed during the last 50 years.

The area under *Furcraea* is estimated as being about 20,000 acres, but there are very few plantations and the industry depends on uncultivated plants. Commercially, the result is that when prices are low, supplies fall rapidly and increase as prices rise. This is possible because the plants need little attention and have a life of seven to ten years.

Exports.

48. Exports in recent years have been about the same as before the war. Markets for the fibre are found in Belgium, the United States, the United Kingdom and France, but a company has been formed locally to produce bags from the lower grades of fibre.

Exports of Mauritius hemp

(thousand tons)

1925	1.9
1926	2.5
1927	1.9
1928	2.5
1929	2.4
1930	1.4

(D) SUNN HEMP

A soft
hemp.

49. Apart from a small experimental production of true hemp in Canada, India is the sole Empire source of soft hemp. Indian hemp is known on the London market under a number of names, generally those of the producing districts, and the term sann or sunn, by which all these fibres are described in India, is only applied in London to a few grades. The fibre serves the same purposes as the lower grades of true hemp (*Cannabis sativa*) which it resembles. It is obtained by retting the stalks of the sann plant or *Crotalaria juncea*. The range in quality of the fibre so produced is wide.

50. Cultivation of *Crotalaria juncea*, which is almost entirely confined to India, is centred principally in the United Provinces, Bombay, the Central Provinces and Madras. It is not, however, grown solely for fibre production, for being a leguminous plant, it is valuable as a rotation crop; further, in many parts of India, the cultivators are encouraged to grow the plant as a green manure. Estimates of acreage therefore give no true indication of fibre production. Cultivation and exports.

Exports account for only a part of the production of fibre, for there is a large local demand for cordage. The amount exported varies with the European supplies of true hemp. Most of the fibre has been consigned to Belgium since 1920; before that date it was generally sent to London.

Exports of sunn hemp from India

Calendar years	Thousand tons
1925	33.8
1926	23.8
1927	25.6
1928	25.2
1929	24.5
1930	17.8
1931	12.2

V. HEMP TRADE AND MANUFACTURES IN EMPIRE COUNTRIES

51. A high tensile strength is perhaps the principal quality which most users want in a rope, and hemp is used for rope making largely because, while remaining flexible, it has a high initial strength which it retains under hard wear. Colour is also an important quality. In many cases, as for example on the decks of ships, colour is an asset in itself, but many buyers regard it also as an indication of strength; and indeed anyone without knowledge of the strength of two apparently similar ropes is likely to choose the one with the better appearance. The manufacturer, therefore, can and does pay more for a white fibre even though he knows it to be weaker than a cheaper but less attractive grade. On the other hand, rope buyers in their specifications are usually satisfied to state that the fibre to be used shall be new, long, clean, and free from tow. The qualities required in hemp fibres.

The manufacturer has other requirements, of which the most important is that the fibre shall be well cleaned or stripped. In the process of hackling, the short ends (tow) and dust are combed out, and in calculating the cost of the raw material this loss must be allowed for; though it may be reduced by hackling or carding of the tow, and spinning it as tow yarn. Special regard has to be paid to this point in buying soft fibres. In the hard fibres, over

90 per cent. of the fibre is generally of usable quality. In the soft fibres, the loss from tow, dust and dirt may be considerable, amounting to as much as 15 or even 30 per cent., for in many Indian hems the tow is too short and weak to be worth carding. This factor has undoubtedly been important in the competition which sisal twines are offering to soft hemp twines; for in general the hard fibres give a high yield of usable fibre, although some New Zealand fibre inclines to be "tow", especially at the ends. Length and fineness of texture are two other qualities which the manufacturer wants. Good and regular length is more important in hard than in soft fibres though manila is sometimes so long that it has to be cut. In soft fibres or in fibre which is to be used for twine making, the fineness of the fibre is important, because it determines how thin a twine can be spun. In the case of fibre which is to be made into binder twine, for use in Canada and the United States, a further requirement is a minimum salt content. The presence of salt in the fibre attracts insects, etc., and we are informed that manufacturers commonly treat the fibre to make it insect-proof. For this reason, under an Ordinance of 1929, if an inspector in Tanganyika finds salt in any sisal, he may serve a notice on the estate compelling them to mark conspicuously as "Salty" all sisal meant for export.

"Hackling"
—the
preparation
for
manufacture.

52. The first process in manufacturing hemp—that of "hackling" or "dressing"—is designed to lay the fibres parallel and to comb out the tow and short ends. The bales are opened and the fibre is fed into a machine in which two endless belts, moving at different speeds, carry the fibre forward between rows of prongs; as the hemp passes from the end of the slower belt it is caught up and carried forward on the prongs of the quicker, which by its more rapid movement straightens the fibres. Six or more of these machines may be used to complete the process, and as each time the prongs are closer, so the fibres get closer and straighter. Further, as each machine is fed, there is an opportunity to mix different kinds and grades of hemp until often, when the hackling is finished, the expert can hardly tell what fibres have been used.

The making
of cordage.

53. All the other processes of making cordage, except for certain plaited cords and rope, are done by twisting. The dressed fibre is spun into yarn on machines, which vary in size from those making one yarn to others capable of spinning twenty. Twine of small diameter (or, to the layman, string) is made with only a few yarns, twisting together more yarns will give a cord or line up to one inch circumference and from still more yarns or several strands a rope of greater circumference is made. For this, either a rope-walk or a spinning machine, known as a "house machine" is used. At one time, every sea port had its Rope Walk, though like Sir Arthur Quiller-Couch's "Troy Town" it may now call it the Marine Parade. It was here that rope was made by hand for local use

until about the middle of the last century, when power was applied to the rope walk and machinery was developed. The length of rope which can be made on a rope walk is limited; but for the house machine there is no limit, so that nowadays the rope walk is used only for the finest quality twines, cords and ropes. The strands are likely to be more even in length than on a house machine, so a better laid rope is produced.

(i) UNITED KINGDOM

54. Hemp yarn is itself the raw material not only for string, Hemp cords, ropes and nets but also for the making of canvas and for yarn other textile purposes. The figures of each successive Census of Production in the United Kingdom have, however, shown that the manufacture of hemp yarn is being more and more concentrated in the hands of cordage makers. Few makers of yarn alone remain and the manufacture of hemp yarn—and also almost certainly its use—by firms associated with the other textile trades, such as linen, has decreased heavily. Very little hemp yarn is sold as such. In 1924, over 97 per cent. of the yarns spun by rope and twine manufacturers was worked into cordage before sale.

The following figures illustrate the total "make" of hemp at each Census of Production in the United Kingdom since 1912.

Production of hemp yarn

Census of production	Covering	By firms in the Rope, Twine and Net Trades (tons)	Per cent. of total	By other manufacturers (tons)	Per cent. of total	Total (tons)
1912	Gt. Britain and Ireland	47,130	59	31,740	41	78,870
1924	Gt. Britain and N. Ireland	58,960	88	7,950	12	66,910
1930*	Great Britain	50,915	95	2,555	5	53,470

* Provisional figures

Between 1912 and 1924, the United Kingdom consumption of hemp certainly fell. In 1924, imports of hemp yarn exceeded exports by 3,700 tons; with this addition, the total quantity available to manufacturers was 70,600 tons. In the trade returns of 1912, the figures for exports and imports of hemp yarn are not separately recorded. It is therefore impossible to say whether in 1912 there was an excess of imports or of exports. Comparison between 1924 and 1930 cannot be made, for the last census did not include Northern Ireland, which is an important centre for the manufacture of rope and cordage. It is therefore incorrect to assume that the large decline shown in the table above indicates

a severe fall in United Kingdom manufactures. The net import of hemp yarns in 1930 was 2,200 tons. Hemp is certainly used for fewer industrial purposes than in pre-war days. Jute has very largely supplanted it in the backing of carpets, and cotton and jute in the manufacture of canvas; so that the market for hemp fibres in the United Kingdom is now, for all practical purposes, restricted to manufacturers making ropes, twines and nets.

Cordage
output of
Great
Britain, 1924
and 1930.

55. Hemp cordage in the United Kingdom Census of Production figures and in the Trade Returns, is classified under two main heads—(i) cordage under $\frac{1}{4}$ inch diameter and (ii) cordage of $\frac{1}{4}$ inch diameter and over. The former group is sub-divided into binder twine and "other sorts" of cordage. This division does not exactly correspond with any trade classification, yet the three groups are fairly distinct in the uses to which they are put and in the kinds of hemp used.

In paragraph 25 we stated that about one quarter of the weight of hemp entering international trade consisted of bast or soft fibres. Manufacturers in Great Britain, however, make nearly seven times the weight of hemp yarns from hard fibres that they do from soft.

Production of Hemp Yarns, 1930

	Tons.
Manila and other hard fibres	46,560
Italian, Russian and other soft hems	6,910
	53,470

This larger output of hard fibre yarns is merely one result of the tendency of the industry in Great Britain to concentrate on the manufacture of heavy cordage. This is clear from a comparison of the figures of production in 1924 and 1930.

Census of production—Great Britain

Kind of Goods	1930	1924
	Thousands of tons	
Cordage, cables, ropes and twine of hemp		
(i) Under $\frac{1}{4}$ inch diameter		
(a) Binder and reaper twine	7.4	14.1
(b) Other sorts		
Of hard hems	7.8	} 14.4
Of soft hems	5.1	
(ii) Of $\frac{1}{4}$ inch diameter and over		
Of hard hems	34.6	} 33.9
Of soft hems	3.3	
Nets of hemp	2.4	} 2.8
Nets of other materials	.8	

56. The recent course of foreign trade in large and small cordage has been in marked contrast. Whereas in the first class (which includes all twines, small cords and lines), net imports up to 1930 steadily increased, in the second class (which covers the larger cordage and all rope), net exports increased. This is clear from the following table.

Foreign
trade in
cordage.

United Kingdom net exports or net imports of hemp cordage
1922-30*

(in thousand tons)

Year	Under $\frac{1}{2}$ inch diameter			$\frac{1}{2}$ inch diameter and over	Total all cordage
	Binder twine	Other sorts	Total		
1922	- 1.6	- 0.2	- 1.8	+ 5.7	+ 3.9
1923	—	+ 0.2	+ 0.2	+ 7.8	+ 8.0
1924	+ 0.7	+ 0.2	+ 0.9	+ 7.9	+ 8.8
1925	- 3.7	+ 1.2	- 2.5	+ 6.7	+ 4.2
1926	- 1.5	- 1.9	- 3.4	+ 7.8	+ 4.4
1927	- 1.1	- 2.2	- 3.3	+ 8.2	+ 4.9
1928	- 2.4	- 2.5	- 4.9	+ 10.0	+ 5.1
1929	- 0.6	- 2.6	- 3.2	+ 11.4	+ 8.2
1930	- 1.4	- 4.9	- 6.3	+ 8.5	+ 2.2

* Net export (+)=export less retained import
Net import (-)=retained import less export

57. The production of binder twine in Great Britain in 1930 was 7,400 tons, which was only a little over half the production in 1924. It is unlikely that the production of binder twine in Northern Ireland has increased to compensate to any extent for this decline in the manufacture in Great Britain. In 1924 the Northern Ireland output was 3,800 tons, which was 21 per cent. of the total United Kingdom production. In recent years exports have not been large, generally some 2,000 tons a year, of which over a half has gone to Empire countries. Although, as shown in the table in paragraph 56, there has been since 1924 a net import of binder twine, this has never been on a large scale. The conclusion is inevitable that with the progressive decline in the acreage under cereals in Great Britain, the market for binder twine has steadily shrunk.

Binder
twine.

58. The production of other small cords and twines (i.e., kinds under $\frac{1}{2}$ -inch diameter other than binder twine) show a less severe decline. In Great Britain the production of these light strings and cords was 12,900 tons in 1930 as compared with 14,400 tons in 1924. The table in paragraph 56 shows further that it was in this

Other
small hem-
cordage.

class of hemp goods that the steadiest and most marked increase in net imports occurred. Unlike binder twine, therefore, the market in Great Britain for these small cords and twine has been slowly growing, and it seems that in spite of this, production had slightly declined between 1924 and 1930. .

Since the winter of 1931 the position has, at least temporarily, changed. Under the Abnormal Importations (Customs Duties) No. 3 Order, which came into force on December 19, 1931, a duty of 50 per cent. *ad valorem* was imposed on cordage, ropes and twine, under $\frac{1}{4}$ -inch diameter of vegetable fibres. On April 26, 1932, this duty lapsed and a duty of 15 per cent. *ad valorem* was placed on all "cordage, cables, ropes and twine other than coir yarn (including hard fibre singles, polished, starched, or glazed singles, and all multiples) whole or partly of vegetable fibre other than cotton, linen, ramie or sea-grass". The effect of these duties was to reduce imports severely. During the three months ending March 31, 1932, imports of cordage under $\frac{1}{4}$ -inch diameter were only 235 tons, compared with 2,160 tons over the same period in 1931 and 2,730 tons in 1929.

Cord
output
Great
Britain
and I

Growing
use of
hard fibres
for small
cordage.

59. For many years soft hems were regarded as best suited for most of these small cords and lines; but a reference to the table in paragraph 55 shows that in 1930 more than half were made from hard fibres. In recent years there has in fact been a big change from the use of polished twines made of Italian, Russian, Central European or Indian soft hems to the so-called trawl (ply) twines made of hard hems—especially sisal. Even an unobservant shopper must have noticed that the string with which her parcels are now tied is of a different sort from that used a few years ago. The whiteness of sisal twine has attracted buyers while the low price and small wastage in spinning is important to manufacturers, who at the same time have improved the processes of making sisal twines so that they are now much finer and better finished. Because of the low prices at which sisal twine has been obtainable during 1931 and 1932, it has also been used in place of twines usually made from other hard fibres. New Zealand hemp, because it is softer than the other hard fibres, used to be extensively employed for tying up newspapers and cardboard boxes where it is important that the string shall not cut into the package; but of late the price of the fibre has been high compared with sisal, so that sisal twines have been encroaching on this special market. In the same way, though manila retains its almost complete monopoly for trawl twines for net making, sisal has been more and more used for the small cords which can be made from manila, sisal or New Zealand hemp.

Rope and
large
cordage.

60. Nearly two-thirds of the hemp cordage manufactured in Great Britain in 1930 consisted of rope and large cordage. The production of the larger hemp cords and of all hemp rope and

cables—which make up the second main classification “ of $\frac{1}{4}$ -inch diameter and over ”—was 33,900 tons in 1924, and 37,900 tons in 1930. This is the only section in which production in 1930 exceeded that in 1924.

The table in paragraph 56 further shows that the exports of this class of rope and twine are the only ones to increase between 1922 and 1930.

61. The foregoing analysis of production and foreign trade in cordage shows clearly that in the United Kingdom between 1922 and 1930 the tendency has been for the manufacture of large cordage to increase and that of small cordage to decline. Thus the trend of the demand in Great Britain for fibres suitable for heavy ropes has been in marked contrast with that of fibres for small cords and twine. This trend does not correspond with the trend of production of fibres in the Empire. An expansion in the manufacture of large cordage unfortunately offers limited encouragement to the Empire fibre producer, looking to the United Kingdom for a market, because the bulk of the large cordage consists of ropes of widely varying sizes made almost exclusively from manila and used very largely for marine purposes. On the other hand, in the manufacture of small cordage, used for marine or industrial purposes, similar exclusive reliance is not placed on manila. Sisal and New Zealand hemp are also used. Sisal especially, on account of its low price, is making its way into the markets of other fibres, though Empire producers have to meet severe competition from the well prepared and graded sisal of the Netherlands East Indies.

Importance
of large
cordage.

62. The whole of the United Kingdom hemp supply is imported. The imports and re-exports are classified in the Annual Statement of the Trade of the United Kingdom as (i) hemp, not dressed, (ii) hemp, dressed and (iii) hemp tow or codilla. The condition of the fibre at the time of entry is thus shown, but the kind of fibre is not specified. Therefore the quantities of the different fibres imported cannot be determined with certainty. However, particular types of fibre are in the main associated with different countries and it is thereby possible to identify the types to which 90 to 95 per cent. of the gross imports belong. But it is not possible to differentiate in this way imports through entrepôts, or re-exports. It certainly would be helpful to Empire producers if the items in the United Kingdom Trade Returns distinguished between the main types of fibres, as is done in the returns of some of the Dominions and several foreign countries.

Classifica-
tion of hemp
in the Trade
Returns.

63. The table below gives the gross imports into the United Kingdom of each kind of fibre as far as identification is possible. It also gives the totals of re-exports and the retained imports. In compiling this table the three categories given in the United Kingdom Trade Returns—not dressed, dressed and tow—have been added together.

Hemp
imports.

*Imports of Hemp and Hemp Tow into the United Kingdom before
the War and in 1924, 1929 and 1930*

	Thousand tons				Percentage of gross imports			
	1912-13 Average	1924	1929	1930	1912-13 Average	1924	1929	1930
True hemp	25.2	11.5	11.8	9.0	17.0	10.6	12.6	10.8
Indian (Sunn) hems	15.8	7.4	5.0	3.9	10.6	6.8	5.3	4.7
Manila	73.9	63.7	50.6	50.2	49.8	58.5	53.3	60.2
Sisal and Henequen	1.0	10.4	8.7	7.9	.7	9.5	9.3	9.5
New Zealand hemp	22.8	6.2	6.7	4.5	15.4	5.7	7.1	5.5
Mauritius hemp	2.2	.2	.5	.4	1.5	.2	.5	.4
Unidentified balance								
(i) Germany, Bel- gium, Nether- lands, United States	5.0	6.7	8.6	5.0	3.4	6.2	9.1	5.9
(ii) Other countries	2.4	2.7	2.2	2.5	1.6	2.5	2.3	3.0
Gross Imports	148.3	108.8	94.1	83.4	100.0	100.0	100.0	100.0
Re-exports	53.4	26.1	18.4	14.3	36.0	24.0	19.6	17.1
Total Retained	94.9	82.7	75.7	69.1	64.0	76.0	80.4	82.9

It is at once apparent from this table (of which further details are given in Table 4 of Appendix A) that there has been a general decline in imports of all fibres except sisal. With the trade depression in 1921, gross imports fell to less than half those of the previous year, and though they recovered in the next three years, they have since been at a much lower level. In 1924, the highest year of the recovery, gross imports were 27 per cent. less than the average for 1912-13, and by 1930, a fresh decline had brought them to 44 per cent. below the pre-war figure.

Relative
importance
of the
fibres.

64. If particular fibres are considered, it will be seen that while the imports of the other fibres have fallen since 1912-13, those of sisal have increased. In the case of manila, the decline was relatively less than that of the other fibres, so that manila, as well sisal, now forms a larger proportion of the gross imports than before the War. As would be expected the figures of retained imports reflect the change which we have already noted as occurring in the output of manufactures in Great Britain. We have shown that large cordage now forms nearly two-thirds of the output of rope makers in Great Britain. This is largely used for shipping purposes, for which manila is preferred. Manila constitutes more than half the retained imports and the proportion has increased.

*Retained Imports of Hemp and Hemp Tow and of Manila Hemp,
1925-30*

Year	Hemp and hemp tow	Manila hemp	Percentage of manila
	Thousand tons		
1925	71.6	42.0	58.6
1926	57.2	29.0	50.6
1927	82.1	40.8	49.7
1928	74.7	41.8	55.9
1929	75.7	41.0	54.2
1930	69.1	41.6	60.2

Of the other fibres, the soft hems (true and Indian) are to-day used less in shipping and in the distributive trades, and this would account not only for the large fall in imports but also for the fact that they are now a smaller proportion of the total. The case of New Zealand hemp calls for special explanation. This fibre, as was shown earlier, has a particular value to certain users who will consequently pay a relatively high price; however, once this demand is satisfied, any further supply must compete with grades of manila and sisal which in recent years have been offered at lower prices than those at which New Zealand hemp could then be produced. As a result the import of New Zealand hemp shows a greater fall than that of any other fibre.

65. The general decline is even more noticeable in the figures for re-exports, which have never recovered from the depression of 1921. In fact, 1927 showed a further decline. The loss of the re-export trade was largely attributed by our witnesses to the high cost of port charges, labour and storage rents in the United Kingdom. We were informed for instance that in 1931 whilst sterling was on a gold basis if hemp were brought to London and not required, it was cheaper not to land it, but to tranship and send it to Antwerp, where the charges were then less than one-half those in London. The Liverpool re-export trade in hemp suffered a somewhat similar disability and had virtually disappeared by 1931 while that of London had been halved between 1919 and 1929. In Appendix B we give the scales of port charges at London, Antwerp, and Hamburg in August 1914 and March 1932, computed on a gold basis. The schedule of charges varies and close comparisons are difficult to make, but it appears that on a gold basis the charges other than for warehousing have been increased at London by from 40 to 60 per cent., at Hamburg from 60 to 80 per cent., while at Antwerp, though the charges for watching have increased more than 100 per cent., the charges for the reception of the goods, sampling and storage on the quays have fallen.

Decline in
re-export
trade.

66. Not only has the United Kingdom re-export trade fallen, but the figures given in the table in paragraph 63 indicate that increasing quantities of hemp are coming through foreign entrepôt markets. Such imports appear there under the heading in the table, "Unidentified balance," and it will be seen that in both amount and proportion of the total of hemp imported, they have become increasingly important. London has clearly been feeling the effects of competition in the entrepôt trade.

Decline in
imports of
Empire
hemp.

67. At it happens, the total retained imports of hemp in the United Kingdom were almost exactly the same in 1929 and 1919. But whereas the Empire supplied more than one-third of the quantity in 1919, it supplied less than one-sixth in 1929. In other words, in that year the United Kingdom utilised half the amount of Empire-grown fibre that it had used ten years previously. There is some exaggeration in this statement because a certain amount of Empire fibre is concealed in the imports from foreign countries which, like Belgium, have an entrepôt trade. Nevertheless, this indirect import is not large enough to invalidate the conclusion that Empire hemp producers as a whole have, since 1919, been finding a contracting and not an expanding outlet in the United Kingdom.

Moreover, as between these two years the re-export trade in Empire-grown fibres has declined more severely than that in foreign-grown fibres.

Re-export of Hemp and Hemp Tow from the United Kingdom

	1919	1929
	Thousand tons	
Empire grown	26	8
Foreign grown	19	10

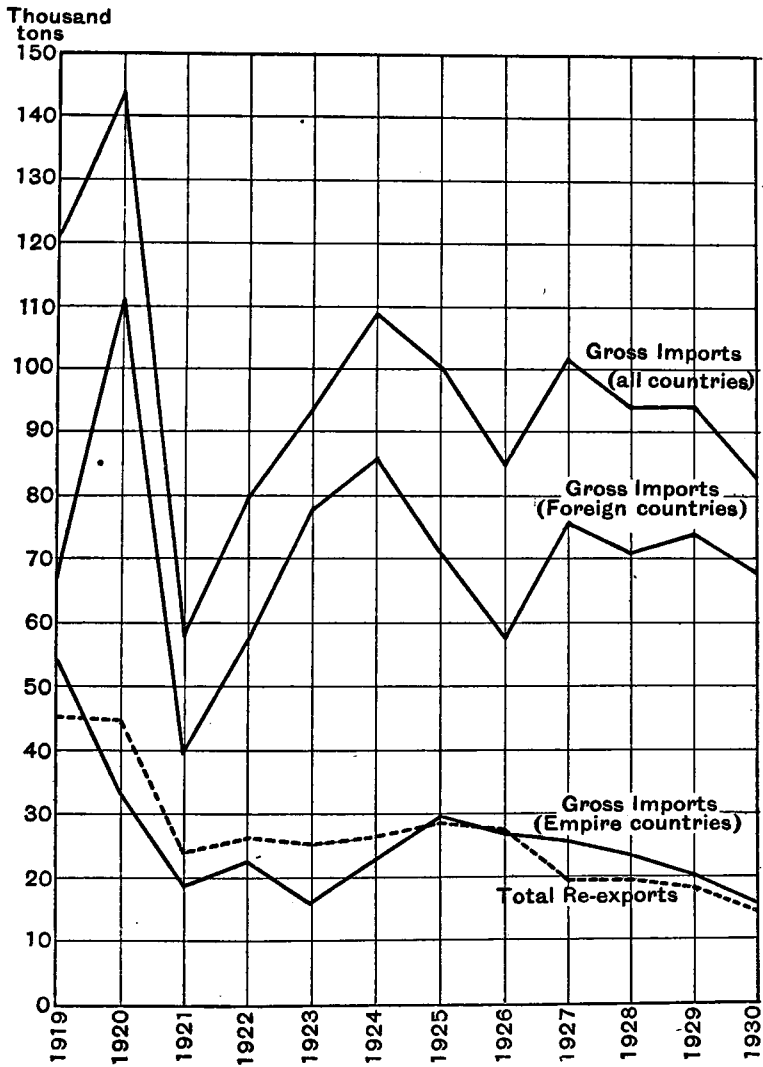
(Figures are approximate)

68. The figures given in Table 3 of Appendix A are an answer to the objection that comparisons between particular years give a false impression. They show not only that gross imports from the Empire were less in 1929 than in 1919, but that they have been steadily declining in amount for the six years 1925-30 and as a percentage of the total for the last five years.

The gross imports of all kinds of hemp into the United Kingdom reflect very roughly, as might be expected, the course of general trade activity (see Diagram I). The heavy fall in 1921 and subsequent rise to 1924 corresponds with the course of general wholesale prices; again, in 1930 and 1931, total imports have declined. This rough correlation between imports of hemp and trade activity does not, however, affect the other question to which we have just drawn attention—the relatively greater decline in the use of Empire grown hems.

DIAGRAM I

*United Kingdom Gross Imports (showing Empire and foreign share)
and Re-exports of Hemp Fibres, 1919-30*



(ii) CANADA

Hemp
cordage
production.

69. Judged by the amount of fibre used, the largest cordage industry in the Empire, apart from that of the United Kingdom, is found in Canada. But as would be expected from the differing conditions of the two countries, development of the rope industry has been on very different lines from that in the United Kingdom. Whereas, as we have already shown, the tendency in the United Kingdom has been to increase the output of large ropes and cordage, the tendency in Canada has been to increase the output of binder twine. This is clear from the following figures taken from the annual Census of Production.

Principal hemp products of the Canadian Rope and Cordage Industry, 1924-30

(thousand tons)

Kind of Goods	1924	1925	1926	1927	1928	1929	1930
Binder Twine of all materials	25.6	21.5	26.1	27.5	32.7	36.6	26.6
Twines	.2	.2	.2	.4	.5	.3	.6
Rope							
Of manila hemp	2.5	3.3	3.1	3.7	4.0	3.9	3.3
Of sisal	1.9	1.9	2.0	1.3	1.6	1.6	.8

Binder
twine in
Canada.

70. From the table in the foregoing paragraph it is clear that the industry was gradually expanding until it received a set-back in the depression of 1930. In fact, by 1929 the industry was approaching the position in which its annual output of binder twine would be sufficient to meet the full normal Canadian demand.

Consumption of Binder Twine in Canada, 1923-30

(thousand tons)

	1923	1924	1925	1926	1927	1928	1929	1930
Production	19.3	25.6	21.5	26.1	27.5	32.7	36.6	26.6
Net Import	16.9	6.7	16.9	8.8	1.7	7.2	1.3	2.3
Consumption	36.2	32.3	38.4	34.9	25.8	39.9	37.9	24.3

Cordage
imports.

71. Changes in the classifications used in the Canadian Trade Returns make comparison between imports of hemp twine (other than binder twine), cord and rope over a period of years difficult, but it appears that the total imports do not greatly exceed a thousand tons in any year and of these, the United Kingdom generally supplies about three quarters. Exports of cordage, except binder twine, are given by value only.

72. At each annual Census of Production, cordage manufacturers supply figures of the materials used by them. These figures are given below for the years 1925-8 and 1930; in them, the heading "African and other" appears, from the size of imports, to cover principally sisal. Hemp fibres used in Canadian rope industry.

*Hemp Materials used by the Canadian Cordage Industry,
1925-8 and 1930*

(Thousand tons)

	1925	1926	1927	1928	1930
Hard fibres					
Manila	6.2	6.5	4.7	3.9	7.5
New Zealand hemp	1.4	1.9	1.8	1.4	.9
African and other	9.3	10.2	8.9	12.4	10.3
Sisal	6.7	10.3	14.5	16.1	8.3
Soft fibres					
True Hemp	.2	.2	.2	.3	.7
Total	23.8	29.1	30.1	34.1	27.7

Most of the fibre is imported through the United States. For example, in 1930 the imports classified under the headings "hemp and hemp tow," "manila fibre" and "sisal fibre" amounted to 21,809 and of this 97½ per cent. came from the United States. Consequently, it is impossible to state how much of the fibre was of Empire origin. Some, though not all of the New Zealand hemp used, arrived direct from New Zealand and in some years a little British East African and West Indian sisal was imported direct or through the United Kingdom.

73. As elsewhere, sisal is the fibre chiefly used in Canada in making binder twine, though manila and other fibres are at times also used. An element of uncertainty exists in regard to the character of the fibres described in the table in the preceding paragraph as "African and other" but it is safe to say that most of such fibres were sisal; that table shows that the increase in hemp materials used in Canada since 1925 has occurred under the two headings of "African and other" and sisal—in fact sisal. An increase in the use of the combined harvester-thresher must lessen the demand in Canada for binder twine; but it is possible that the present severe depression in the wheat growing areas may check temporarily the purchase of expensive harvesting machinery, and in any case it is highly improbable that the change over to the combined harvester-thresher will be so rapid as to cause the practical cessation of the use of binder twine. It is not always realised that the production of binder twine in Canada is equal to one half of the production of all kinds of hemp string, twine, ropes and cords in the United Kingdom. Consumption of sisal.

Probably most of the sisal imported from the United States is of Mexican origin. Competition with sisal from Mexico must be severe in the Canadian market, but with the increasing output in East Africa there would be an opportunity for attempting to promote closer trading relations between the Empire manufacturer of binder twine in Canada and the Empire producer of sisal in East Africa and the West Indies.

(iii) NEW ZEALAND

Production of rope and twine.

74. The production of the New Zealand cordage industry is officially classified as (i) rope and (ii) twine; the average annual output for the years 1926-30, under these headings was 1,264 tons and 1,474 tons. Imports of "rope and cordage" averaged only 156 tons a year while values only are given for the small imports of twine. The average consumption of materials over the same years was 1,555 tons of phormium fibre and 1,118 tons of other fibre. It seems probable that the whole of this other fibre was not hemp, for hemp imports, of which 73 per cent. came from the Philippine Islands and 20 per cent. from the Netherlands East Indies, averaged only 764 tons. While, therefore, the locally produced fibre is the most important source of raw hemp, it is clear that the principal import is manila.

Production of Rope and Twine, with the amount of Phormium tenax used by the rope industry and Hemp imported into New Zealand, 1926-30

(thousand tons)

Year	Production of		Phormium tenax used by the Rope Industry	Hemp Imports
	Rope	Twine		
1926	1.4	1.4	1.4	.7
1927	1.3	1.6	1.5	.7
1928	1.2	1.5	1.3	.8
1929	1.2	1.4	1.6	.8
1930	1.2	1.5	1.9	.8

(iv) AUSTRALIA, SOUTH AFRICA AND INDIA

Trade in hemp fibres and cordage.

75. The figures of the Census of Production taken in Australia, South Africa and India do not give the amounts either of cordage manufactured or of raw materials used and it is, therefore, necessary to take the imports of hemp as a measure of the size of their cordage industries and the use of hemp fibres in these countries.

The imports of raw hemp into Australia are not large and of them a small amount is re-exported to New Zealand. Over the five years 1926-30, the average net import was 7,395 tons a year, of which about 38 per cent. was imported from New Zealand, 33 per cent. from the Netherlands East Indies and 22 per cent. from the Philippine Islands. Although Australia is an important wheat producer, most of the crop is harvested with "header-harvesters" or "combines" so that the use of binder twine is small and imports averaged only 368 tons. Imports of other hemp twines were about 300 tons a year. The foreign trade in hemp cords and rope is given by values only and is, therefore, not comparable with the figures given for the other Dominions; but supplies are drawn chiefly from the United Kingdom.

In the Trade Returns of the Union of South Africa imports of lax and hemp are grouped together but, judging by the countries of origin, they are chiefly of hemp. The import has grown in recent years, but is still very small, the average for the five years 1926-30 being only 280 tons. Imports of binder twine have only once, in 1930, reached 100 tons and though the amount of "shop twines" imported is not stated, the value is about the same as for binder twine. The average import of rope from 1926 to 1930 was 381 tons.

No real indication of the amount of rope and cordage made in India is given by the hemp fibre imports as stated in the Indian Trade Returns, for throughout the country fibre is prepared by the cultivators and made into rope for their own use. There are, however, a few factories which use a certain amount of imported hemp, and the average imports for the five years 1926-30 have been 1,545 tons, of which just over 80 per cent. has come from the Philippine Islands. During the same period, imports of cordage and rope have averaged just under a thousand tons; most of this has come from the United Kingdom, but an increasing amount has been imported from the Philippine Islands. There are some imports of hemp manufactures other than cordage, the chief of which is hemp cloth from the Straits Settlements.

Imports of Hemp into Australia and India, and of Hemp and Flax into the Union of South Africa, 1926-30

(thousand tons)

Year	Australia : Net imports of Hemp	India : Imports of Hemp	South Africa : Imports of Hemp and Flax
1926	7.7	1.6	.1
1927	8.0	1.5	.5
1928	7.4	2.0	.2
1929	6.8	1.5	.1
1930	7.1	1.2	.5

Duties of
imported
cordage in
United
Kingdom
and Canada.

76. This review of the rope industries in the chief Empire countries shows that the two large markets for hemp fibres produced in the Empire are the United Kingdom and Canada. Whereas in the United Kingdom the tendency of the industry has been towards heavy cordage and the increased use of manila, that in Canada has been towards binder twine and an increased use of sisal.

It is too early to judge the effect of the departure from the gold standard and of the recent duties imposed in the United Kingdom. We have already shown that the imports of small cordage and twine in the first quarter of 1932 were far below those of the corresponding period in 1931. Under the duties in force (June, 1932) Empire producers of most hemp fibres enjoy a preference in the United Kingdom market, while United Kingdom manufacturers receive the benefit of a 15 per cent. duty against competing imports of foreign origin. The duties are :—

10 per cent. *ad valorem* on all hemp fibres except *Cannabis sativa* (hemp and tow); all hemp fibre of Empire origin shipped direct or on a through bill of lading being admitted free;

10 per cent. *ad valorem* on hemp yarns; Empire products shipped direct or on a through bill of lading being admitted free;

15 per cent. *ad valorem* on all hemp cordage; Empire products shipped direct or on a through bill of lading being admitted free.

In Canada, all imports of hemp fibres are admitted free and also binder twine and any materials which enter into the cost of binder twine and are imported by manufacturers for use therein, as also twines and ropes not exceeding $1\frac{1}{2}$ inches in circumference used for the fisheries. Otherwise duties on hemp goods are as follows :—

Yarns, light cords, twines,	25 per cent. under the General
cords and ropes.	Tariff, and 18 per cent. under
	the British Preferential
	Tariff.

There is also the general provision under the Dumping Duties applicable to all imports from the United Kingdom if corresponding goods are manufactured in Canada. In that case if they are sold to the importer for a figure which in dollars is less than the market value in England, converted at an arbitrary exchange of \$4.40 to the £1, then the difference is payable as duty.

London
hemp prices.

77. As we explain in paragraph 142, market intelligence regarding wholesale sales of hemp in the United Kingdom is for the most part restricted to that available in merchants' and brokers' circulars. The following tables of prices have been compiled from information supplied to us by the courtesy of two firms. In these tables we give the average annual London prices for each of the five years 1926 to 1930 and monthly prices at quarterly periods for 1931 and 1932. It will be noticed that on the whole prices fell steadily to 1930, that they broke badly in the latter half of 1930 and early 1931, that the fall in the prices of hard fibres has been

relatively more severe than in soft fibres and that the price of high grade Italian soft fibre is consistently above that of any of the other hemp fibres.

Average c.i.f. London prices for certain grades of Hemp Fibres

(a) HARD FIBRES

Average price		Manila : J2	East African: Sisal No. 1	New Zealand Hemp: High Fair	Mauritius Prime
Figures in pounds sterling per ton					
		£ s.	£ s.	£ s.	£ s.
Year	1926	43 0	43 0	38 0	39 5
	1927	43 0	38 0	36 0	36 5
	1928	38 0	37 0	33 0	38 10
	1929	37 5	39 10	34 5	37 0
	1930	26 10	27 10	27 10	28 5
March	1931	18 5	16 0	(20 10)	(22 10)
June		18 0	15 10	(20 10)	(22 10)
Sept.		18 5	15 0	(20 5)	(21 10)
Dec.		20 0	16 5	(20 0)	(24 0)
March	1932	19 0	14 10	(18 5)	(22 10)
June		17 10	13 7½	(16 10)	(22 10)
Percentage fall between :					
(i) 1926 and June 1931		58	64	46	43
(ii) 1926 and June 1932		59	69	57	43

(b) SOFT FIBRES

Average price		Italian : PC/SB	Russian : Siretz— Group I, Sort I	Indian Hemp	
				Fine Jubbelpore (H.J.F.)	Benares No. 2
Figures in sterling per ton					
		£ s.	£ s.	£ s.	£ s.
Year	1926	60 0	53 10	27 0	23 0
	1927	60 0	47 0	25 0	19 0
	1928	67 0	52 5	26 5	20 15
	1929	59 15	52 0	27 0	21 15
	1930	45 10	35 10	20 10	19 0
March	1931	30 5	(26 0)	14 10	13 0
June		30 5	(26 0)	14 5	13 5
Sept.		32 0	(26 0)	14 5	11 15
Dec.		40 10	(33 0)	17 5	13 17½
March	1932	42 5	(37 0)	15 0	12 15
June		44 0	(34 0)	14 0	12 2½
Percentage fall between :					
(i) 1926 and June 1931		49	51	47	42
(ii) 1926 and June 1932		27	36	48	47

Figures in brackets are largely nominal, transactions being few.

78. The figures recorded above are for grades widely used in the United Kingdom. In some cases there are several higher grades as well as lower ones, as for instance in manila and New Zealand hemp. It will be seen from the foregoing tables that the departure of the United Kingdom from the gold standard in September 1931 checked the fall in sterling prices which was taking place. In fact it caused sterling prices to rise though gold prices still continued to decline. In the first half of 1932 the decline in sterling prices was renewed and at the time of writing this report (June, 1932) are lower than any others given in the tables. This rise in sterling prices in the winter of 1930 comparatively small though it was, afforded a slight alleviation to producers in countries in which the currencies were linked to sterling e.g., East Africa and India; and for the same reason the further decline has been somewhat mitigated.

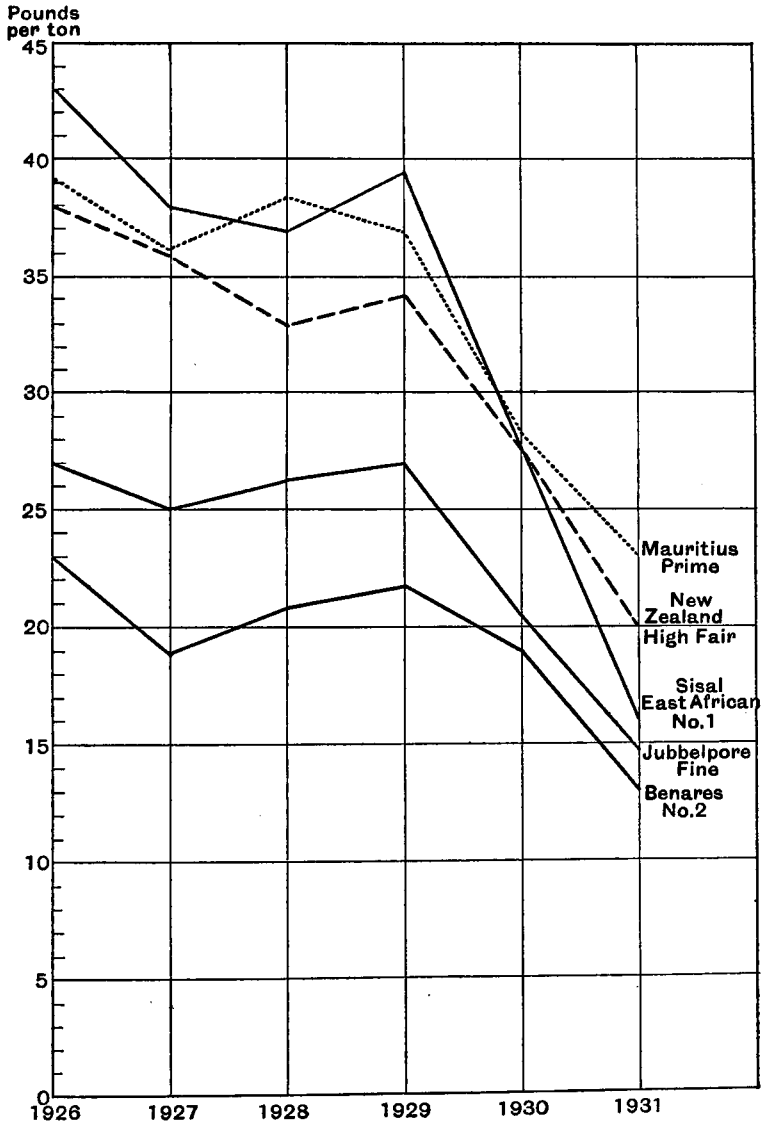
Scope for
Empire
hemp in
Empire and
foreign
markets.

79. On the average of 1928 and 1929 Empire countries produced about 17 per cent. and absorbed about 21.6 per cent. of the hems entering into international trade. The similarity between these figures does not however justify the facile conclusion that the Empire is approaching self sufficiency in hemp production. Although, as we have shown in this report, many of the hemp fibres are interchangeable on a price basis, yet certain hems remain predominant for certain purposes. Further, though a well developed cordage industry in any country will manufacture practically every kind of rope and twine, the industries in different countries have a marked bias. This is well illustrated by the case of the United Kingdom and Canada. The bias has been towards the manufacture of large ropes and cables, especially for marine purposes, in the former and towards the manufacture of binder twine in the latter. The reasons for such "bias" are obviously deep rooted in the general economic activities of the different countries. These activities cannot be altered to accommodate them to the particular kinds of hemp fibres which happen to be grown in Empire countries. Whilst, however, it is chimerical to regard all rope manufacturers within the Empire as potential users of Empire hems to the exclusion of those of foreign origin, yet, none the less, the Empire does afford a very large market for those Empire products. That market should be capable of expansion. Over the period 1924-30, 24.7 per cent. of the gross imports of hemp into the United Kingdom came from Empire sources. It is not possible to state the corresponding figure for Canada, as so much of the hemp used there is imported through the United States.

80. Towards supplying the varied needs of the Empire markets, Empire countries provide a large but not a complete range of hems. They have nothing at present which is recognised as equivalent to manila for certain special and important purposes. In the Indian fibres they possess a soft hemp capable of a wider use if supplied in better quality and in better condition. In sisal and in

DIAGRAM II

*Average Annual London Prices for certain grades of Empire Hemp
Fibres, in pounds per ton, 1926-31*



phormium, especially the former, they have fibres capable of serving many purposes, and pushing their way into uses—whether as string or heavy rope—for which, not so many years ago, other fibres held the monopoly. The limits of their utility are not yet known. And if, as we believe to be the case, Empire fibres cannot and will not for many years supply all the qualities which Empire manufacturers look for in their raw material, yet we would expect their possibilities to be tried out in Empire manufacture. In this connection, the adoption by Government Departments in the United Kingdom and by the British Standards Institution of specifications for sisal and phormium ropes would greatly assist in establishing a recognition of their utility not only in Empire markets, but in the markets of the world. To attain this end, however, standards of production and sale must first be established and maintained; and in addition experience must be gained of the behaviour of the ropes manufactured from these fibres. We understand that the Technical Co-ordinating Committee on General Stores for United Kingdom Government Departments will consider the advisability of including in the cordage specifications an alternative clause permitting the use of sisal or other Empire grown fibres after receiving reports on the trials now in progress.

VI. THE PREPARATION OF HEMP IN EMPIRE COUNTRIES

(A) SISAL

Methods of cultivation.

81. The amount of care which is given to the preparation of the soil before planting the *Agave*, and to its subsequent cultivation, differs as widely between estates as between countries. In Tanganyika some growers only clear the bush and dig a hole where each plant is to go. A similar method is followed in Mexico, but there the soil is so thin that the young plants must generally be supported by a couple of stones. On the other hand, on some estates in Kenya the land is ploughed and harrowed after it has been cleared; and in Java, not only is the soil carefully prepared, but, because of the heavy rainfall and of the harm done by water standing round the roots, open drains are dug every thirty-six feet.

82. The thick fleshy leaves, which when they are fully grown measure from three to six feet, grow straight out from a short trunk. At an age varying with the climatic conditions under which the plant is grown, a stem or "pole" grows up from the centre of the plant and rapidly reaches a height of twenty or thirty feet. Lateral branches grow out from the pole and on these flowers develop, but the plant does not commonly set seed. In the pamphlet, "Sisal Hemp, its Adaptation to Jamaica", the writer says that he had seen sisal seed in Yucatan and that "old planters, who are reliable authorities, assured me that they have been sown and afterwards planted with good results". In general,

the plant propagates itself from vegetative growths, but in East Africa, viable seed has been obtained in the Kenya Highlands only. When the flowers fall, small buds are left in the axils, just below the flowers and these develop into miniature plants. These "bulbils," of which two to four thousand are produced on one pole, fall to the ground when a few inches long and, given suitable conditions, take root. In addition, suckers grow out from the rhizomes, so that new areas, developed on plantation lines, as in East Africa, can be planted with either suckers or bulbils, though the latter have first to be grown in a nursery for about a year.

83. The spacing of the plants also varies between countries and estates. In the Highlands of East Africa, where the plants are commonly placed six feet from each other in rows eight feet apart, only 900 are put to the acre. Nine different methods of spacing are in use in Mexico; that which is considered to be the most satisfactory gives 960 plants to the acre but up to 1,920 per acre are planted. In the East African coastal belt, about 32 square feet are allowed to each plant, giving 1,360 plants to the acre. The method used in the Netherlands East Indies gives the largest number of plants per acre. A space of $4\frac{1}{2}$ feet is left between the open drain and the end rows. Parallel to the ditches two rows are planted 3 feet by 3 feet staggered, then a space of 9 feet is left and two more rows are planted. This method of planting gives 2,170 plants to the acre and has so far been found to be the most satisfactory, though experiments are being made with other spacings, very largely because the method of planting affects the labour of weeding. The heavy rainfall of Java and Sumatra results in a rapid growth of weeds. Normally the land is weeded five or six times a month, and if the weeding is held up for a short time it quickly gets out of hand. In East Africa, where the climate is less humid, the practice is to weed several times a year until cutting begins, but thereafter only annually after the leaves have been cut.

The Dutch method of spacing has been tried in Kenya and Tanganyika, but some growers have found difficulty in cutting between the narrow rows, while others think the cost of completely clearing the old plants and replanting is too high. They prefer to plant suckers between the rows after the earlier cuttings, and this new plant takes the place of the old when it dies. By means of this "interplanting", the land is continuously cropped and the time between the death of successive crops is shortened from eight to six years so that the acreage necessary to secure a constant rotation is reduced.

84. Opinions vary as to the optimum conditions for the development of the plant. Given a tropical climate with a moderately humid atmosphere, the *Agave* will flourish on rough, dry, stony or rocky soils, which are unsuited to other crops. In fact, some would consider it wasteful to plant sisal where other crops would

Yield of
fibre.

flourish. It can adapt itself to a fairly wide range of climate and soil, but its habits are affected by changed conditions of growth. Thus the average life of the plant varies from six years in Java and seven years in East Africa up to fifteen years in Mexico. In exceptional conditions the plant lives for 25 years in Mexico and a Kenya planter informed us that he had on his estate plants which were eighteen years old and from which leaves were still being cut. It was at one time believed that the plant grew the same number of leaves whatever the length of its life, but it has been shown that this is also a variable factor, though the cause of the variations is unknown. Marked differences in the yield of fibre from the sisal leaf have been noted. The average yield is about $3\frac{1}{2}$ to 4 per cent. of the weight of the leaf but with a heavy rainfall the leaves are fleshy and the proportion of fibre is lower. The plant is capable of adjusting itself to a much higher rainfall than is usual in its natural habitat, but it suffers from drought when accustomed to higher rainfalls. Thus in a period of drought the leaves droop and though after a good fall of rain their appearance rapidly returns to normal, time has to be given for the plant to resume the growth of fibre, otherwise there is only a small yield. A good soil reduces the fibre percentage, much as a heavy rainfall does, but by increasing the number of leaves it may actually produce a heavier yield of fibre per acre. It is generally considered unnecessary to manure the land on which sisal is grown; there are in fact estates in East Africa where sisal has been cut continuously off the same area for 23 years. Another point on which opinion varies widely is the necessity for lime in the soil and its effect on the plants. In Mexico, the plants are grown in pockets of soil on limestone, but the percentage of lime in the deep soils of Kenya is very small.

Cutting of
the leaves.

85. In East Africa, cutting is begun during the third or fourth year and further cuttings are generally made once a year during the rest of the plant's life. In the more humid climate of the Netherlands East Indies, the plants reach maturity more quickly, and a small cutting may be made at the end of the first year of growth. Thereafter, twice a year, all the leaves are cut which are at an angle of less than 45° to the ground. In Mexico, the first cutting is not obtained until at least the fifth year.

86. As the leaf can be cut all the year round, expensive machinery for preparing the fibre can be regularly employed and its use in sisal production has extended so far that, over a long period, efficient machinery and factory organisation is a major factor in the prosperity of the industry. Within twenty-four hours of the leaves being cut, the fibre must be extracted and, since 100 tons of leaf must be carried to the factory for every 3 tons of fibre produced, it is clear that the topography of the estate may materially affect the costs of transport. Where development is on plantation lines, a light railway is laid down to take the leaves to the factory, which is built so that the distance from all the fields is minimised.

87. In an East African factory, the leaves are roughly graded by length and then fed into the "decorticator". This machine has two large drums on the faces of which are bolted blunt steel or bronze knives. The drums are situated on either side of the central conveyor ropes or chains, which grip the leaves as they are fed into the machines. These drums successively deal with a half of each leaf as it passes them and scrape away the pulp from the fibre. During decortication, a head of water is introduced to wash the fibre and carry away the megasse (waste pulp). The wet fibre is then taken to the fields and hung on wire fences or sisal poles to dry in the sun. A few growers have installed artificial drying machines. Whether these affect the quality of the fibre is unknown; from the producer's point of view, they not only shorten the period of preparation but save the labour of carrying the sisal to and from the drying fields, cut out waste due to fibre being dropped or stolen and reduce the proportion of tow as the fibre is handled. The dry fibre is graded and mechanically brushed, in order to remove any dry pulp which still adheres to it. We understand that some United Kingdom manufacturers have received complaints that workmen's hands have been injured by wire which has been found in East African sisal and sisal ropes. This wire may come from the brushes used by some producers, and for this reason we urge that particular care should be taken in the choice of the type of brush to be used. After brushing, the fibre is baled in an hydraulic press. We have received complaints that some East African fibre has been press-packed before it was thoroughly dry. Apart from possible damage to the quality of the fibre, it is clear that such a practice is detrimental to the producer's interests, for manufacturers will not long buy such fibre. Since freights are charged on measurement, efficient baling is of the utmost importance and a hydraulic press is maintained by each estate—though it may be in use only a few hours a week. It may be that some estates are so placed that overhead costs could be lowered by co-operation to establish a company at some central point, equally convenient to them all, where fibre could be sent for baling.

88. The disposal of the megasse is a problem of prime importance to the estate manager, since it forms about 97 per cent. of the bulk of leaf taken to the factory. It contains not only waste tissue, but also 15 to 30 per cent. of the fibre in the leaf mostly from the butt end of the leaf. Except when prices for fibre are high, it does not pay to extract this waste fibre from the megasse; though it has been used experimentally to make cellulose for artificial silk or paper and for a number of other purposes. Attempts have been made to produce alcohol from the megasse but in experiments conducted by the Kenya Department of Agriculture the proportion of alcohol recovered was too small to make the process a commercial proposition. On some estates in East Africa and the Netherlands East Indies, the waste is burnt to supply at least a part of

Preparation
of fibre.

The
"megasse"
or waste
pulp.

the power required for the factory. It is understood that machines have been developed by some of the Dutch producers to save the fibre in the megasse; but it is doubtful whether this can pay except when fibre prices are high.

Preparation
in the
Netherlands
East Indies.

89. In the Netherlands East Indies, the factories are worked day and night, in 12 hour shifts, thus the share of overhead costs per ton attributable to machinery is brought as low as possible. Otherwise, the factory organisation and equipment is very similar to that in British East Africa. The principal difference lies in the use of centrifugal washing machines, into which the fibre is put after it is taken from the decorticator and from which it goes into the artificial driers, which are essential because of the frequent rain. When dry, the fibre is beaten by hand against bars. Brushing is considered uneconomic, as tending to increase the proportion of short fibre or tow. However, the percentage of tow resulting from brushing in East Africa seems no higher than that found in the Netherlands East Indies. Whether the brushing actually damages the fibre so that it makes up into a weaker rope has not been properly established.

Preparation
in Mexico.

90. In Mexico, locally manufactured decorticators are largely used. The fibre is rarely washed at any stage in its preparation and is dried in the sun immediately after decortication. It has been claimed that washing spoils the quality of the fibre; yet it improves the colour and in consequence increases the price obtainable. Mexican sisal is generally sold for 10 per cent. less than East African on the London market. Experiments made in East Africa on decortication without water seem to show that the unwashed fibre loses its strength more rapidly. Only a small proportion of the Mexican fibre is brushed before baling.

Research at
Amani.

91. Both the plant and its cultivation offer a wide field for research, for there is an almost entire absence of scientific knowledge of the sisal plant. The Sub-Committee of the Colonial Advisory Council of Agriculture and Animal Health, which reported on the future of the East African Agricultural Research Station at Amani, envisaged development of that station as the main Empire research centre for fundamental work on sisal. In February, 1931, an Agricultural Research Conference was held at Amani, and in view of the need for co-ordination of research work a " Programme of Scientific and Agricultural Investigations Required for the Sisal Industries in East Africa " was drawn up. This programme, which is given in detail in Appendix C, covers research into genetics, physiology, soil science, agronomy and the extraction of fibre. The Conference agreed that work under the first two headings should be done at the Amani Research Station.

92. Preliminary general surveys have already been made of the effect of different methods of propagation, spacing, cutting and of soil conditions on growth rates, fibre yields and poling age.

In addition plants have been raised from seed obtained through the East African Sisal Growers' Association. The slow growth of the *Agave* means that at least five years must elapse before results can be expected from any experimental work, but success in determining the optimum soil and climatic conditions for sisal in East Africa or in establishing a new hybrid with a higher fibre yield should very considerably lower the average cost of producing sisal. It is therefore unfortunate that the shortage of finance and staff is delaying field scale genetical and physiological work. In view of its importance to East Africa, we recommend that the research work at Amani on sisal should be given financial assistance to the maximum that the present need for reducing national expenditure will allow.

93. In addition to the long range research to be undertaken at Amani, there are the short term problems included under the heads of agronomy, extraction of the fibre and soil science. The fall in the price of sisal in 1930, and the low level maintained since then, have convinced producers of the need for adopting any means which may reduce their costs of production, not only to meet the present depression but to strengthen their future position. Certainly the divergence of opinion on many practical questions of production which we have met in our enquiry shows the urgent need for short range investigations.

Need for
short range
research.

94. Governments and planters in Tanganyika and Kenya are primarily interested in different aspects of this research work. They have none the less agreed to co-operate and exchange information. In Tanganyika, the Sisal Growers' Association has urged the Administration to establish an experimental station to investigate the problem of crop husbandry. In Kenya, the general terms of a Sisal Industry Bill had been agreed and the Bill drafted, when the disastrous fall in wholesale prices held up its passage. Under that Bill, experimental work was to be financed from a fund formed by a levy on exported fibre at a rate not exceeding two shillings a ton and by an annual contribution from the Government equal to the proceeds of the levy. The first appointment proposed was for an agricultural economist to study the economics of the industry and it was further intended to make a grant to the Amani Institute for sisal research, on condition that a similar grant was made by the Tanganyika producers.

95. The need for short range investigation is therefore recognised; foundations are laid for the exchange of results; the initiation of work waits for funds. At the moment of writing this report, it is probable that neither the planters nor the Governments, either singly or jointly, are able to finance work of this nature, but the need for it is so urgent in the interests of the industry and of the Colonies that it would be most regrettable if, when the present severity is relaxed, it were at all delayed.

The necessity for further investigation into the decorticating machinery used in the sisal industry has been recognised; and the Government of Kenya recently secured a grant from the Colonial Development Fund for testing a new type of machine which has recently been evolved.

An economic survey.

96. It is probably unnecessary to defer action until all parts of these schemes become financially possible. Advantages may easily accrue from putting part of them in hand. Judging by the way costs have been lowered in East Africa since the immediate post-war period, and especially in recent years, great improvements have been made in estate and factory equipment, organisation and management. But we have been led to believe that considerable differences persist between the practices on individual estates. The immediate prospects of the industry are such that the more backward estates will have great difficulties in surviving if they fail to bring their practice to the standard of their more efficient neighbours. A detailed economic enquiry into the practice and management of existing estates may not be possible, both because of the expense and because estates do not at present keep their accounts on a uniform plan, but we believe that the whole sisal industry in East Africa is likely to benefit from an economic survey based on the method of the Farm Management Surveys*, which have been made in many parts of the world. Such a survey would have the advantage of speed and cheapness. It should provide the Governments and the growers with information, not now available, on which they may base their future policies; further, it should show individual growers the lines along which they may look for a reduction in their costs. We therefore recommend that such a survey should be made as soon as possible and that, while at least half the cost of the survey should be borne by the Governments and planters, the Empire Marketing Board might render some assistance. A local commission representing the Government and planters should be set up in Tanganyika and Kenya, where such a survey is contemplated, to administer the scheme and assist whoever makes the survey.

Station for cultural experiments.

97. It is hoped that an early start may be possible in establishing a station for cultural experiments. Over half of the East African output of sisal is produced in the coastal area of which, we understand, the locality round Tanga is typical. It would therefore appear advisable to start the first station in that neighbourhood. While independent, it would work in co-operation with Amani, and might be able to assist in the fundamental research carried on there. The experience gained at such a Central Station in the Tanga area would determine whether sub-stations should be established in other parts of East Africa.

* The procedure of the Survey method is described in "The Survey Method of Research in Farm Economics", J. P. Maxton, M.A., B.Sc. Empire Marketing Board No. 14.

98. Sisal producers have so far given most attention in matters of machinery to the decorticator, with two chief objects (i) to recover a higher initial percentage of fibre from the leaf, and (ii) to reduce the costs in carrying cut leaf to the factory by using portable decorticators on the estate. The first of these is the more important. At present from 70 per cent. to 85 per cent. of the fibre in the leaf is recovered, the rest is washed away with the waste from the factory. The problem is to reduce this loss of fibre. As regards the second, no portable decorticator has as yet been invented which is so economic for estate purposes as a central factory.

Improvement of machinery.

99. Factory costs—decortication, brushing, baling, upkeep of machinery—differ only by about ten per cent. from the cost of cutting and transporting the leaves, which is generally recognised as one of the heaviest expenses on a sisal estate. It is therefore clear that the economic production of sisal fibre is not only the task of an agriculturist; it has an equally important mechanical side. Efficient factory management must depend in the last resort on the individual in charge, but we do not doubt that the general efficiency of the industry as a whole could be raised by the pooling of experience which might result from an enquiry such as that suggested in paragraph 96. Apart from that aspect of the question, many sisal producers are not satisfied with the performance of much of the present machinery. The incorporation of improvements and new ideas must, we believe, come from the machinery manufacturers in consultation with producers of sisal, but if an experimental station is established, it might be advantageous to provide facilities there for testing under strictly comparable conditions different forms of decorticating machinery and other machines such as driers.

100. Sisal production in the Bahamas is on an entirely different scale from the East African plantation industry. The whole output of the islands is less than that of many individual estates in East Africa. None the less the industry plays an important part in the general economy of the islands. As a rule each peasant raises the food required for his family, the maize, guinea corn, beans and chickens and occasionally a few sheep and goats. Sisal provides him with a cash crop or a mainstay against drought, for it requires very little care, and also suffers less from hurricanes than any other crop. The fall in prices of sisal has thus been a very serious matter for the islands. So far the peasantry have not found an alternative cash crop, and at the recent unremunerative level of fibre prices they have almost ceased to extend their plantings of sisal and have tended to neglect those already in existence. Secondary bush has been allowed to grow around the sisal, scarring the leaves. Cutting is not done regularly with the result that the plants pole rapidly. Plants which have poled are left to die or rot. In a few places, replanting is being done with suckers and bulbils. Generally the suckers are left among the older plants and in the strong winds

Cultivation in the Bahamas.

their apical spines do much material damage, cutting and scarring the parent plant. Disease is not serious; the most common form affects the tip of the leaf and kills the tissue for a few inches down.

101. Cutting of the leaves is done by the men and the rest of the preparation of the fibre is carried on by the women and children. The cut leaves are weighted down in shallow sea water; this retting process goes on for three or four days, according as the water is more or less shallow, for this greatly influences its temperature. After the leaves have been retted, the fibre is washed out and hung on fences to dry. Recently a small hand machine for extracting the fibre has been introduced by a Canadian manufacturer.

Local
marketing.

102. No more preparation is given to the fibre. The peasants trade their small output at the island stores and the storekeepers send loose bundles of the fibre they have bought to Nassau by schooner. On the journey, spray and waves often make the fibre wet again and if it is not properly dried it may go mouldy. On its arrival at Nassau the fibre is sold for the owners by the captain of the schooner, who receives either the freight charge alone or freight and a commission. He has generally neither time nor interest to search out the best market for all the produce of which he has to dispose. Most of the fibre has in the past been exported to the United States.

The fibre cannot be used for binder twine because of the presence of salt but being retted and not mechanically decorticated it is comparatively soft and can therefore be used for cheap twines and cordage.

Measures to
improve the
fibre.

103. The unsatisfactory conditions of the industry have been recognised and action to improve them has been initiated. As far back as 1918 an Act was passed providing for the optional inspection of sisal for export but it has never been effectively used. Steps have now been taken to make inspection and grading compulsory, with the object of ultimately establishing standard grades. The staff of the Board of Agriculture is paying increased attention to disseminating better methods of cultivation among the peasants, and is attempting as far as possible to supervise their preparation of the fibre.

If these measures can be effectively carried through they should greatly improve the quality and regularity of the fibre. It appears, however, that if the industry is to reap the full value of such improvements the methods of marketing at Nassau will need revision. This has already been considered; but so far not much progress has resulted. Without the inducements resulting from better prices, little permanent improvement can be expected; but merchants dealing on a comparatively large scale find difficulty in offering higher prices for small occasional lots of better quality. Wholesale trade is not conducted on specialities. It would, however, be reasonable to expect the co-operation of the merchants in raising the average quality of the whole output of a

locality, so that that produce might obtain a better name and could be relied upon for quality year after year.

(B) NEW ZEALAND HEMP

104. There are two recognised species of this plant, *Phormium tenax* and *Phormium Colensoi*. The leaves of the former are the source of commercial hemp because they give a higher yield and better quality fibre. There are however, in addition, a large number of crosses and hybrids, which have evolved in the course of time and have made selection and improvement difficult but essential. *Phormium tenax* thrives in a wide range of conditions; in a wild state, it is found principally in swamps, though it flourishes best on a well-drained alluvial soil. It has been introduced into many parts of the world as an ornamental garden plant. The sword-like leaves grow straight out from the rootstock in a "fan" shape; and except that the leaves may be ten or more feet long, the plant looks very like the common iris. The plant.

105. For the most part, the *Phormium tenax* area in New Zealand is confined to the old swamps. Open drains have generally been made to keep the water table two or three feet below the surface level; and after drainage phormium has grown more luxuriantly and has crowded out most other forms of vegetation. But in general, new areas receive little preparation, and once they have been planted no further attention is given, except to keep the drains clean, until the leaves are cut. In the Bay of Plenty district, in Martinborough and in the North Auckland peninsula a small acreage has been planted out in well prepared soils and subsequently cultivated. Swamp management.

106. Cutting is only done during the spring and summer months, for in winter the fibre cannot be dried in the open "paddocks", and in some districts there is also a danger that a frost immediately after cutting may injure the young leaves. Most of the area being worked is cut every three and a half or four years. It was at one time the practice to cut off the fan very close to the ground; but this weakened the plant's vitality, besides including material useless for fibre extraction, and there was a reaction towards cutting only the older side leaves. The extra trouble—involving two cuts with the knife—has prevented the general adoption of this method, and the usual practice now is to cut the fan off six or eight inches from the ground. Cutting of the leaves.

The leaves have often to be carted a considerable distance to the mill. In some cases the millers do not own the swamps, but work them on a royalty basis; in others, millers owning swamps work others in the neighbourhood, paying royalty on the leaf cut. On some of the larger swamps tramways are laid before cutting and trolleys are used to take the bundles of leaves to the mill.

Preparation
of the fibre.

107. As soon as possible after cutting, the leaves are roughly graded for length and appearance and fed by hand two or three at a time into a machine called a "stripper". The majority of the mills have only one or two strippers but there are some bigger mills whose owners make a whole time business of fibre preparation, and in the aggregate turn out a very large part of the total production. The principle of the stripping machine is the same as that of the sisal decorticator. The phormium leaves are gripped by two rollers, which feed them between a fixed "beater bar" and a rapidly revolving drum on which are blunt knives. This cleans off most of the "vegetation" and leaves the fibre, which falls over a travelling chain and as it moves along, is played on by jets of water which remove the loose vegetable matter still clinging to it. "Stripper slips" and "stripper tow" are saved out of the megasse and consist principally of fibre, beaten off in the stripping process, mixed with a certain amount of vegetable matter. The remaining waste is run off into the streams. The fibre, after washing, is made into loose hanks and left to drain. It is then taken into the drying fields or "paddocks". It remains here, lying on the ground or over wire-fences, until it is bleached and dry; it depends on the amount of sunshine how long this takes, but at least once during the four to seven days which it remains here it is turned to complete the drying process. The fibre is then carted back to the mill and the remaining dry vegetable matter is knocked off in the scutching machine. Either each end of a hank of fibre is held before a skeleton drum, the beaters of which knock out the dust and short fibre or tow, or the fibre is put on a moving chain and is automatically held so that first one end and then the other is scutched. After the hanks have been lightly twisted and doubled they are ready for baling. This is done in presses very similar to those used for wool, and the hemp is usually compressed to about 110 cubic feet to the ton. These bales are further pressed before export by the shipping companies, who put two bales together and increase the density to about 60 or 65 cubic feet to the ton.

The tow recovered in scutching is shaken to remove the dust and is then also baled at the mill. The only grading done at the mill is the sorting of the leaves for length and the rejection of blemished leaves. Any sorting for colour or appearance after completion of the stripping process would be too expensive and would not be justified by the return.

Some
conditions
for
recovery
and
develop-
ment.

108. As we have stated in paragraph 43 the industry in New Zealand, like the fibre producing industries in other countries is passing through a period of severe depression which is principally due to general economic causes. The future recovery and development of the New Zealand hemp industry may be viewed from three aspects; that of the plant itself, the machinery used and the economics of the industry. Research on the first must be directed to secure improvements by the selection of strains highly resistant to disease and giving increased yields of good quality fibre. Secondly,

there appears to be considerable scope for improvement in the existing machinery. Improvements in these two respects should have a considerable bearing on the ability of the industry as a whole to meet competition from manila and sisal but further development will to a large extent depend on improvements in the internal organisation of the industry.

109. So far the industry has mainly depended on the wild plant, which is said to flourish luxuriantly after the swamps are drained. This practice allows no scope for plant selection or the evolution of more prolific or better types. It has also been found that in the drained swamps leaf disease is apt to become troublesome, reducing in time the yield of leaf and consequently of fibre. Research on
the plant.

110. Intensive research on the physiology, genetics and diseases of *Phormium tenax* has been in progress since 1928. This work, which has been carried on principally at the Massey College, is organised through a Committee of the New Zealand Department of Scientific and Industrial Research. Money is raised by a cess on exports at the rate of a shilling on each bale of fibre and sixpence on each bale of tow, with a levy of a shilling per acre on non-producing areas. An equal contribution to the fund is made by the Government. The research workers have already picked out strains which have a fibre content as high as 25 per cent. At present, on good phormium areas, 25 tons of green leaf can be cut from an acre every three or four years. This gives a yield of about three tons of fibre and 12 cwts. of tow—that is, roughly, 14 per cent. of the green leaf—so that the scope offered for improvement is great. By the middle of 1931, about eight acres had been planted with pedigree and hybrid strains, and though the decline in exports of hemp has greatly reduced the available income a considerable amount of the work was able to go on with no great expense, because seedlings take about eight years to reach maturity. Unfortunately, some of the other research has had to be stopped before much benefit has accrued. An investigation into the cause of yellow-leaf disease and the attempt to breed disease-resistant strains has had to be brought to a close with inconclusive results. This is the more regrettable as this disease is the most destructive so far experienced. All the leaves of an infected plant first turn yellow, then later become brown and shrivel up and as the disease is infectious, a large area may be damaged. We are of the opinion that all this research work deserves every possible encouragement and we hope that its renewal will not be unnecessarily delayed.

111. It is unfortunate that the decorticating machines best suited for sisal are not suitable for phormium, because of the differences in the leaves' characteristics. While the sisal leaf is of a fleshy nature, the phormium leaf has a tougher outer cuticle with a different fibre distribution in the leaf. The view is widely held in New Zealand that the machinery at present used is defective and that it should be possible to devise machines which would not only recover a The improve-
ment of
machinery.

higher percentage of fibre from the leaf but would also produce a better quality. "The present method of milling phormium is capable of considerable improvement, especially in connection with the extraction of the fibre in an unimpaired condition. The vital part of the process is the stripping, and it is here that improvement is most desired. Up to the present, however, this has not been effected to any great extent, the improvements that have been adopted dealing mainly with the after-processes. The extraction of the fibre from the green leaf tissue by means of a hard beating process reduces its strength and produces a large amount of waste material."*

Bonus offers.

112. The present strippers used for phormium, like the sisal decorticator, are developments from the old "raspador", embodying many improvements but following the same general principle. The "raspador" was the invention of a Franciscan monk who competed for and won a prize—or bonus—offered in the middle of the last century by the Mexican Government for the invention of a machine to extract the fibre from sisal. From time to time since 1894, the Government of New Zealand has adopted similar means to encourage the invention of a machine especially suited for treating phormium. Many improvements have been evolved, principally by the local fibre producers, but the full bonus offered has never been awarded. Despite the lack of success in the past, a new offer of £10,000 was made in February 1930 and remained open till May 1932. The standards set were high. The bonus was payable "wholly or in part for a commercially practicable process whereby a greatly improved quality of fibre marketable at a higher price is obtained, also a larger quantity of fibre per ton of green leaf with a substantial reduction in the cost of production". The minimum conditions for any bonus demanded a 15 per cent. increase over the "net returns of an efficiently managed flax-mill" and that 90 per cent. of the fibre extracted from a test run on 500 tons of green leaf should be of a grade not lower than "good fair". This last condition seems very high in the light of the fact that in the five years 1927 to 1931, on an average only 7.9 per cent. of the hemp graded in New Zealand came into that grade or above it, while 77.8 per cent. was in the "high fair" and "low fair" grades. Nevertheless the offer did stimulate some attempts in the United Kingdom to devise a machine to satisfy these conditions, but only one machine has been shipped to New Zealand for test.

Agricultural
engineer.

113. The advances in the design of the sisal decorticator have partly resulted from the high capitalisation of the industry and its rapid expansion. The New Zealand hemp industry provides a much smaller market for new machinery and it may therefore be necessary to stimulate the development of improved designs.

* "Phormium tenax—The New Zealand fibre industry" by E. H. Atkinson. New Zealand Department of Agriculture Bulletin No. 95 (New Series), page 40, 1922.

to consider, however, that advance is more likely to come from continuous experiment than from the spasmodic attempts at improvement which are started by occasional bonus offers. We therefore recommend, for consideration by the New Zealand Government, the appointment of an agricultural engineer to deal with machinery for the hemp industry.

114. The possibility of further mechanising the industry should be considered. At present about seven handlings are involved in the process of preparing the fibre from the stripping to baling. The adoption of artificial drying should be examined, as thereby the labour cost would be considerably reduced, and the working of the factory all the year round become feasible in districts where the danger of frost harming the young leaves is not great. If artificial drying were adopted, it would probably be necessary to reach the fibre. Already some research has been done on the commercial possibilities of carrying this out.

Further
mechanisation.

115. The costs of producing New Zealand hemp are difficult to estimate, for many of the millers are engaged in production during part of the year only, while variations in yield are probably considerable. Costs of milling hemp in New Zealand thus vary greatly not only between millers in the different districts of the Dominion but also between mills in the same district. Further, in some cases, as we have said, millers pay a royalty on leaf cut, while in others they own the swamps they work. It is thus almost impossible to give "typical" costs. We have, however, been supplied with the cost of milling a season's output at an efficient mill. The yield was at the rate of one ton of fibre from 9 tons leaf and costs worked out as follows:—

Costs of
production.

	Per ton of hemp recovered
	£ s. d.
Leaf costs including cutting and royalty	4 19 0
Milling costs including hauling the leaf	7 19 3
Overhead costs	5 7 10
Grading, wharfage, railage and handling	1 18 10
	<hr/>
	20 4 11
	<hr/>

In the report published in February, 1931, of a Committee of inquiry into the Sisal Industry in Kenya, the following average cost structure was given as the cost per ton of sisal at the port.

	Cost per ton
	£ s.
Plantation costs including development	6 0
Factory and haulage of leaf	3 0
Overheads, management, depreciation, etc.	7 10
Cartage, rail and port charges and handling	2 6
	<hr/>
	18 16
	<hr/>

Comparisons between these sets of figures must not be pressed too far. In one case they refer to the results of a particular mill; in the other they are averages based on an unspecified number of instances. It is also possible that the items included in the main heads in each case are not always the same. Further, both sets of figures may not refer to exactly the same season, though we believe that at the most there is not more than one year between them.

If all these be allowed for, it would appear that the milling and haulage costs per ton of fibre are very much higher in New Zealand than in Kenya; whilst the charges for cutting the leaf and for royalty are not so far below those of maintaining a plantation and leaf cutting in Kenya as might be expected. On the other hand Kenya sisal appears to be at a disadvantage under the heading of overheads, management, and depreciation.

Economics
of the
industry.

116. As we have already indicated, the use of improved strains and better machinery will contribute to lowering the cost of production of phormium; but we cannot doubt that there are possibilities of economy within the limits of the present organisation of the industry. We therefore recommend that an economic survey of the industry should be made by an economist with a knowledge of agriculture. The results and conclusions of this research should be made available to all millowners. Further we recommend for consideration the establishment of an experimental station in conditions typical of those in which the industry is working. Research at this centre should be directed to securing improvements in cultural practice, in swamp and plantation management and layout, in factory organisation and mechanical development, and their demonstration to producers.

Cultivation
in
St. Helena.

117. The development of the phormium industry in St. Helena has been on rather different lines from those in New Zealand. We have already indicated in paragraph 45 the manner in which the industry was started. *Phormium tenax* now grows in all parts of the island, at elevations up to 2,500 feet, but it has in every case had to be planted. The greater part of the total area of 2,000 acres is on the hill sides, where it is not possible to plough the land or cultivate between the rows. The single suckers are spaced a foot apart, with three feet between the rows. After three years, each sucker has sent out about thirty new ones and the plants thus protect each other and kill the weeds better than if they were widely spaced. During the war, under the stimulus of high prices, the area under phormium was considerably expanded and some areas, otherwise probably unsuitable, were planted. The preparation of phormium fibre is now the principal industry of the island, occupying in normal times about 8 per cent. of the total population.

118. The average yield of green leaf is about 25 tons per acre in both countries, but the amount of fibre recovered in St. Helena

is only 10 per cent. of the leaf compared with an average of about 14 per cent. in New Zealand. In recent years the St. Helena plants have shown a tendency to produce shorter leaves, though the fibre retains its strength. We were informed that the millers believe this to be due not to degeneration of the strains but rather to too frequent cutting and possibly also to soil exhaustion, for no manuring is done. Experiments made in New Zealand on the effect of manuring *Phormium tenax* have so far shown no significant results.

119. The method of preparation is similar to that used in New Zealand. Cutting and milling go on all through the year, for in the latitude of the island (15° S) there is sufficient sunshine to dry the fibre at all times. Each area is cut every three years, though if possible a longer interval is left between successive cuttings. Because of the hilly nature of the island, transport is difficult, and the leaves are generally taken down to the mills by donkeys or bullock waggons, but in recent years the number of motor lorries available has increased.

Preparation
in
St. Helena.

The machinery used in the mills is identical with that employed in New Zealand, though the output per machine is less, for whereas in New Zealand a good worker can put about 24 cwts. of leaf through the stripping machine in an hour, in St. Helena not more than 15 cwts. are "stripped". The St. Helena mills also turn out a much larger proportion of tow. The difference in output may be due to lower machine efficiency and/or leaf characteristics, for in both countries the worker is paid on a piece-rate basis. The lower level of wages in St. Helena probably makes the difference in output less important than is at first apparent, but a higher standard of efficiency should reduce costs appreciably, since it is estimated that labour, paid at the rate of 2s. for an eight or nine hour day for men and 1s. to 1s. 6d. for women, costs about £10 14s. per ton.

Before the leaves are put through the stripper, they are sorted into three lengths; after this no further grading is done. The fibre is generally not less than five feet long and the short fibres from the young leaves are put with the tow. Colour varies with the rainfall. When the fibre is dry the miller bales it to about .00 cubic feet to the ton and tow is pressed to 120 cubic feet per ton.

120. We feel that the value of the hemp industry to St. Helena makes it imperative that every effort be made to ensure the greatest efficiency at all stages of production. We therefore recommend that both the authorities of the island and the mill-owners should keep in close touch with the results of the research work being done in New Zealand on the plant itself and the other aspects of the industry.

(C) MAURITIUS HEMP

The plant. 121. The Mauritius hemp industry depends principally on uncultivated "aloes" for very few plantations are devoted solely to this plant. There are two main varieties—the "Creole aloes" which yields $2\frac{1}{2}$ per cent. of fibre from the green leaf and the "Malgache aloes" which yields $1\frac{1}{2}$ per cent. of fibre. The plants are similar to the *Agave* in their mode of growth, having the same habit of poling; but they do not readily produce suckers and therefore propagate themselves with bulbils and seeds. The life of the plant is from seven to ten years and it requires less attention than sisal, thus it can be left uncut when prices are unremunerative, with the result that supplies fall off rapidly when prices are low to re-appear as prices rise.

Cutting of the leaves. 122. The plants occur, for the most part, on waste lands and attention to them is restricted to occasional clearing of the shrubby undergrowth, which grows around the "aloes" and hinders the leaf cutting. Every other year leaves are cut from the plants by women and are removed by men to the small local factories. There are about forty of these, each producing fifty to a hundred tons of fibre in a season.

Preparation of the fibre. 124. A sisal decorticator has been tried in Mauritius but was not found satisfactory and the fibre is generally extracted by a "gratte", a small machine, working on the same principle as the "raspador", and producing about 2 cwts. of fibre a day. The machines are manufactured locally for about £14 to £18. Recently a machine of an improved type has been introduced.

After the fibre has been cleaned in the "gratte", it is weighed and tied into bundles of 250 kilos., on which wages are assessed. The bundles are carefully washed in tanks of fresh water and then soaked for 36 to 48 hours in water containing a half to one per cent. of ordinary soap. This sets up fermentation, which eases the removal of the rest of the vegetation and improves the colour of the fibre. After this process, the hemp is again washed in fresh water and then laid on wooden or wire racks to dry and bleach in the sun. When dry, it is put through a brushing machine and then loosely baled before despatch to the central baling plant at Port Louis.

The megasse from the leaves, after the tow has been removed as much as possible, is allowed to rot for two or three years and is then used as manure by sugar growers.

(D) SUNN HEMP

Varied uses of the plant. 125. The growing of sunn or sann hemp (*Crotalaria juncea*) is widespread in India, but it is only in certain limited areas that it has any importance for export. Nevertheless it is important in the general agricultural economy, because it is in wide local demand for rope making and is, further, used as a green manure and for feeding cattle. In their report, the Royal Commission on Agriculture in

India commented on the complaints made to them about the quality of sunn hemp, and the Imperial Council of Agricultural Research have financed an enquiry into the marketing of hemp in India. The summary of recommendations given in the report on that enquiry, is reproduced in Appendix D. The number of uses to which the plant may be put makes the official statistics of the area under sunn hemp in India valueless in estimating supplies of fibre available for export. The acreage devoted solely to fibre production was calculated by a witness to be only one-fifth of the total area under sunn hemp; but it varies from province to province, and the more important districts such as Seoni, Jubbulpore, Devgad, Benares and Pilibhit have given their names—sometimes in a corrupt form, e.g., “Sewnee”—to certain classes of the fibre.

126. When grown as a green manure sunn hemp is commonly sown during the early rains and ploughed in after six or eight weeks' growth, but for fibre production the seed is sown soon after the rains break. Generally it is grown in small patches, which are often of less than a quarter of an acre, and are sown thickly to prevent the plants branching too much, as this spoils the quality and yield of the fibre. Growth is rapid and little attention is necessary until the plant is pulled by hand or reaped with a sickle after three or four months. In some districts harvesting is done while the plants are in full bloom; in others, only when the seed has formed. Not only is there a considerable local demand for seed for sowing purposes, but also, we have been informed by a witness, the foreign demand for it can never be adequately met. As the use of sunn hemp for a green manure is increasing, some of the provincial Departments of Agriculture have encouraged cultivators in the drier and semi-irrigated lands to grow it solely for seed.

Methods of cultivation.

127. For most cultivators, sunn hemp is a sideline from which there can be only a small financial return; much of the work of preparation is left to the women and children. Although all classes of cultivators will grow the plant only the poorer Mohammedans and low caste Hindus actually ret the stalks and extract the fibre. In the first stage of preparation—that of retting—the stalks are soaked in still or flowing water to free the fibres from the tissue and gummy substances surrounding them. In some districts, this must be done soon after the crop is cut before the ponds dry up; in other districts the stalks are stored until the hot weather when the cultivator has more time and the retting is finished more quickly; in others, again, the stalks are dried and the roots cut off before retting—this practice is by no means general but might with advantage be more widely adopted, as the product is thereby improved. The bundles of stalks are submerged in the nearest pond or shallow stream and weighed down with whatever is available—stones, logs or mud. After three or more days, depending on the temperature of the water, the stalks are taken from the water and, in some districts, washed before the fibre is extracted. At this stage, practice differs widely.

Preparation of the fibre.

Occasionally the fibre is extracted separately by hand from each stalk, but the process is slow and the preparation of three or four pounds of fibre is a long day's work. A common practice is for a handful of stalks to be beaten on the surface of the retting pool or stream or moved in the water so that the end of the fibre is first freed. This is then seized and the fibre is pulled from the whole bundle at once. Although this fibre is fairly well cleaned, it is apt to become tangled. Sometimes the stalks are only beaten with sticks or stones and much of the woody centre of the stalk is left among the fibre. The tops of the plants are used for fodder.

Characteristics of local fibre.

128. Indian sunn hemp is generally marketed under the name of the district from which it originated, though it is frequently mixed as it passes through the hands of the numerous intermediaries. The United Kingdom merchants and spinners customarily limit the use of the name "sunn" to one or two grades exported from Benares and Bengal. The finest fibre comes from the Ratnagiri district of Bombay and is known commercially as Dewghuddy (a corruption of the vernacular Devgad), though we were informed by some manufacturers that cordage made from this hemp is not very strong. This fibre is more carefully retted and handled than that from other districts, and generally secures the highest prices. The flowing water in which the retting is done ensures a clean fibre. From the point of view of quality the next best types are grown in the Central Provinces and are known as Sewnee, Itarsi and Jubbelpore. These hems are light in colour but less uniform than Dewghuddy. Next comes the whitish, but strong, Bengal sunn hemp and then the inferior United Provinces' fibre—Philibit and Chandausi hems, which are grown in the districts of Pilibhit and Moradabad—and Benares sunn, which is grown around that city and baled at Shivpur. Philibit hemp is greenish, probably over-ripe and in the lower grades very dirty. Benares sunn is white and often tangled, and is weak in tensile strength as a result of having been either cut too soon or else over-retted; the actual cause of this weakness is not precisely known and might with advantage be investigated.

Retting in muddy water.

129. After it has been dried, the fibre is made into hanks—often so tight that considerable labour is involved in undoing them at the rope factory. In some districts, the hanks may be stiffened with mud or clay to conserve the twist for convenience in handling; but the foreign matter found in much of the sunn hemp exported from India is due not so much to deliberate adulteration as to the cultivators' carelessness in extracting the fibre and even more the fact that only muddy water is available for retting.

Marketing in India.

130. The small lots of fibre are generally sold in the first instance to a village dealer, to whom the cultivator is commonly indebted, often for the seed from which the crop was grown. Under these conditions, the sellers do not always get a fair price and often have to accept whatever they are offered. The dealer may take the fibre into the nearest market, or may sell it to one of the agents, who,

working chiefly on their own behalf, go round the villages buying the various grades of fibre offered to them. It is then taken, loose in a cart or on an animal's back, to the up-country centres, and is sold on a commission basis or directly to the shippers' agents, who are advised of orders each day and who telegraph back to their principals the purchases they have made and the prices paid. At most of these centres there is a small hand press in which the fibre is made up into loose bales or bundles for despatch to the ports, where the loose bales are opened and the fibre is graded hank by hank before being finally baled in hydraulic presses. Occasionally the hanks are shaken to get rid of the mud and stick in them, "but to shake them vigorously would mean too great a loss of weight and so of money". Some of the fibre is dressed before it is exported, by drawing the hank of fibre through a comb of iron nails. The loss of weight which this entails and the extra cost of the work is not generally covered by the difference in prices between dressed and undressed fibre, and only the lower grades, which would otherwise be unsaleable, are commonly dressed.

131. Some research work has been done by the provincial Departments of Agriculture. Experimental tests have shown that although the same species of plant is grown in all parts of India, there are a number of varieties, some of which are definitely superior in fibre quality. In the United Provinces a number of strains have been picked out, and we understand that the Department of Agriculture hopes to organise a supply of seed from the best of these. With regard to preparation, tests have been made, with the help of the Imperial Institute, of the effect on fibre quality of cutting or pulling the plant at various stages of growth and of retting the stalks for various lengths of time. So far 316 samples of fibre have been tested by the Imperial Institute in conjunction with provincial Departments of Agriculture, and their examination points to the importance of the length of time taken for retting. We consider that all this research work deserves encouragement, since the results must form the basis for any improvement in the quality of the fibre prepared, and we suggest that the Imperial Council of Agricultural Research should, in co-operation with the provincial Governments concerned, draw up a co-ordinated programme of research on this crop. Research.

We consider that attention should also be directed to the possibility of extracting the fibre from the retted stalks by scutching machines similar to those used in Europe for *Cannabis sativa*. The cost of these machines would necessarily limit their use to districts where the production was on a fairly large scale.

132. Another point to which attention has frequently been directed and which should be capable of fairly rapid determination by co-operation between Agricultural Departments, Shippers and merchants, relates to the density to which bales are pressed for shipment. Indian hemp is usually pressed to 60 cubic feet, sisal to

60 to 80 cubic feet and Italian hemp to 120 cubic feet to the ton. It is not improbable that the hemp from some Indian districts will withstand a pressure giving bales of 60 cubic feet to the ton without impairing its quality, whilst that from other districts will give the best economic return at lower pressure. It should be worth while to settle this point definitely by a systematic investigation. It is also possible that some of the complaints about the condition in which Indian hemp is received are due more to the fact that it may have been baled when damp than to the density to which it has been compressed.

Possible
value of
sound films.

133. Once the methods of cultivating and preparing sunn best suited to any district have been determined, the difficult problem of spreading the information among the cultivators must be met. This is a problem which, in different phases, confronts the officers of Agricultural Departments in all Empire countries. It is possible that in this connection the discussion in our Report on Cocoa* on the use of sound films for this purpose may be of interest to the officers of the Departments of Agriculture and we commend the relevant paragraphs in that report to their attention.

Improve-
ment of
local
marketing.

134. Attempts to improve the quality of sunn hemp are not new. The Court of Governors of the East India Company directed the attention of the Bombay Government to this subject in 1807 and seemed to regard improved methods of cleaning and dressing the fibre as more important than the extension of cultivation. These efforts met with little success, and we are convinced, both from the evidence presented to us and from the report on hemp marketing issued in India, that any lasting improvement must involve not only better seed and preparation but also improvements in the organisation of the local markets. In this connection the Royal Commission on Agriculture in India reported that :—

“ Well regulated markets create in the mind of the cultivator a feeling of confidence and of receiving fair play, and this is the mood in which he is most ready to accept new ideas and to strive to improve his agricultural practice. Unless the cultivator can be certain of securing adequate value for the quality and purity of his produce, the effort required for an improvement in these will not be forthcoming.” (page 388)

135. It may become possible to arrange that improved strains of seed should be distributed through co-operative societies. If so those co-operative agencies may well become the best channel for receiving and marketing the finished product. It should then be possible to grade and bale the fibre in convenient up-country centres and so to prevent the mixing of fibre from different districts. The question of grading is however closely connected with the marketing of Indian hemp abroad, with which we deal in the next section.

* Imperial Economic Committee, 22nd Report: *Cocoa*, Section XIV, paragraphs 198-292.

In the absence of efficient co-operative societies the Royal Commission on Agriculture in India stated that much might be done by establishing controlled public markets in order to reduce the number of middlemen and secure a fair return to the cultivator. The point to bear in mind is that the existence of a regular supply of a raw product in a compact area, of a quality above the average, will always in the end attract the large shipper and induce him to take special steps to secure it.

136. During and since the War, Indian hemp has received certain fortuitous commercial assistance. In pre-war days its chief competitor was Russian hemp. When prices of hems ruled high demand swung over from Russian to the cheaper Indian hems. Since the war the exports of hemp from Russia have been very small and this has helped Indian hems. On the other hand, as we showed in paragraph 59, a new competitor has entered the field. Twine is now made from sisal. There is thus a grave element of insecurity in the future of Indian hemp. It is unsafe to assume that Russia will be for ever out of the market; meanwhile sisal, a much cleaner fibre, is definitely popular with twine manufacturers and users, who normally account for most of the demand for Indian hemp. When Russian supplies return, therefore, India may find the market for her product very difficult, unless improvements have in the meantime been effected. It is for this reason that we urge the adoption of methods which will improve the quality of Indian hemp and will encourage its export in better condition. These methods involve the use of better seed, cleaner retting, effective grading and better local marketing.

Improved quality—
an economic necessity.

VII. THE MARKETING OF EMPIRE HEMP FIBRES

137. In most Empire producing countries the grower disposes of his hemp through a shipper. Frequently the shipper advances money to the grower during the growing period. On delivery of the hemp, he may either buy it outright or despatch it to an importing country in satisfaction of a contract already entered into, or occasionally ship it on consignment. Where the shipper has not bought outright he charges a commission of about 2½ to 3 per cent. The receiving merchant in the importing country either sells direct to manufacturers or to other merchants.

Outline of general structure of marketing.

138. In the United Kingdom, London is the chief wholesale market for hemp. The other important market is Liverpool, but for all practical purposes it deals only in manila. London is the real market in the United Kingdom for Empire hems, and through it many transactions are effected for Continental buyers. In these cases the contracts are made subject to London arbitration.

139. Transactions in London between merchants are conducted through brokers in the London Commercial Sale Rooms, where two sessions are held daily. By this means a market is always available, where a merchant, at a price, can acquire additional

stocks of particular grades of hemp to satisfy the needs of his manufacturing clientele or dispose of stocks on his hands. In London auctions are now very rarely held; the usual course is for sales to be made through brokers who charge the seller a commission of $\frac{1}{2}$ per cent. and in return guarantee the solvency of both their principals.

Variations
from general
system.

140. The above describes the general structure of the marketing organisation; but the activities of the different participants are not invariably restricted to the roles allotted to them in the foregoing account. In India a few shippers handle the produce of a large number of small and scattered growers. Between the shipper and those growers are a number of middlemen and small merchants who collect the hemp and either bring it to the shipper's up-country representative or forward it to him at the port. In contrast with this are the large estates, as for instance in Tanganyika, developed, financed and controlled by companies with their head offices in London. In this case the London office itself arranges the sale of the produce, usually through London merchants, but occasionally direct to manufacturers. Some of the larger growers in East Africa also ship direct to the importing merchant. In the New Zealand trade in phormium it is usual for the shipper to deal direct with the London broker.

Need for
closer
contact
between
growers and
users.

141. Growers, especially when markets are difficult, are inclined to criticize this marketing system as cumbrous, expensive and involved. On the other hand, each member of it discharges a necessary service, whereby a daily open market is secured to the advantage of both the grower and the manufacturer. There is more reason in the complaint that the grower has no contact with the manufacturer, and so, in the past, has not received first hand information of the needs of the ultimate user. This did not seem of first importance when prices were good and produce moved freely; but when prices fell and stocks began to accumulate, growers in producing countries were undoubtedly bewildered by their general ignorance of manufacturers' views and requirements as to qualities, deliveries and prices. We have received evidence that growers visiting the United Kingdom have devoted considerable effort to studying the position; but growers as such can only obtain that fuller knowledge of manufacturers' needs, and of the prospects of competing fibres—which merchants acquire through their day to day transactions—by themselves participating in those transactions to a much greater extent than they do at present. Such action would almost inevitably involve co-operative organisations in the producing countries, very much on the lines of the New Zealand Meat Producers' Board, and would raise difficult questions of joint control and finance. In 1930 and 1931 the possibility of forming a co-operative marketing organisation in East Africa—especially in Kenya—was actively discussed, but the project made little progress, owing to the diversity of interests and to the fact that many estates were indebted to merchanting or broking houses. So far

as we have been able to ascertain, the only country in which the producers have organised co-operatively for the sale of hemp is Yucatan, where producers are compelled by law to sell all their fibre through the Yucatan Sisal Growers' Co-operative, Ltd. This organisation maintains a European agent in the United Kingdom and an agent in the United States, who sell direct to the manufacturers. In the Netherlands East Indies the production is almost entirely under the control of two or three companies who have their own distributing agents in the importing countries, and their fibre is sold by the agents direct to the manufacturers.

142. Many of the complaints made by growers against the general system of marketing are due to their ignorance of arrivals, sales and the probable output of competing fibres. They feel that in the past they have been working very much in the dark. This feeling has much justification. Several merchants' and brokers' houses issue monthly and annual reports—though a number of firms have stopped doing so in recent months. These reports are often practically restricted to the fibres in which the house is particularly interested. They are generally confined to a statement of market tendencies and closing prices of various grades of hemp at the time the circular was published, or at longer intervals—e.g., annually: they present a general review of a past period. In fact less collated current information is available about crops, shipments, arrivals and sales of hemp fibres than about many other raw materials. Merchants as well as growers have complained of this condition of affairs. We believe that it would be an advantage to both producers, merchants and consumers, if fuller information for all hemp fibres were regularly available and we accordingly recommend that the Empire Marketing Board should examine the possibilities of supplying market intelligence somewhat in the lines already adopted for fruit and dairy produce. Market intelligence.

143. As we have already stated, a large amount of hemp is sold under terms which provide for London arbitration. At the present time, in the event of a dispute between buyer and seller, each appoints an arbitrator. Generally before proceeding further, the arbitrators choose a third person to act as umpire in case they cannot agree on a settlement. Shippers of Indian hems urge, and we agree with the general principle, that the arbitrators and umpire should be appointed by an outside body and make their award without knowledge of the names of either the buyer or the seller. "Blind" arbitrations, such as this, are the rule for jute. London arbitrations.

144. There are at present two Associations connected with the London hemp trade. The London Hemp Association was formed to protect the interests of those connected with the trade in soft hems—true and Indian; while membership of the Manila Hemp Association is open to those in London or domiciled in Great Britain and Ireland, who are interested in manila hemp. The committees of Trade associations in England.

these Associations, which represent shippers, merchants, brokers and manufacturers, negotiate on matters affecting the trade as a whole. For example when, a few years ago, manila hemp was arriving in bad condition, the Committee of the Manila Hemp Association approached the Philippine Islands Fibre Standardisation Board and secured an improvement. In addition to dealing with documentary and insurance questions, terms of contract and standards of grading, the Committee hear appeals, which are made when arbitrators and umpires are unable to reach a settlement. The absence of any associations for the other hemp fibres does not seem to have been felt, though it has been suggested that the scope of the Manila Hemp Association might be enlarged to include the other hard fibres.

Use of
sample
bales in
arbitration.

145. Settlements are made by the arbitrators and umpire on their recollection of the standards which the hemp should reach. Because they are frequently handling the fibre, the arbitrators know the characteristics of the many grades of hemp; yet there is reason to believe that satisfaction would be felt if actual standard bales were used for comparison, as for example is the case in the cotton trade. It has also been suggested to us that such standards would be of use for training purposes and would maintain greater uniformity from year to year. Sample bales of St. Helena fibre are now kept in London, and the case for the adoption of such visible standards is particularly strong where the fibre is an annual crop, like Indian hemp.

Grading of
hemp in
New
Zealand.

146. All hemp fibres are sold on recognised grades and producers' or shippers' marks and not on drawn samples; but the extent to which grades have been standardised in the different exporting countries varies greatly. It has been carried furthest in New Zealand. Since 1903 all hemp for export from New Zealand has had to be certified by the Government grader. Under the regulations governing the grading and export of New Zealand hemp, all phormium products intended for export must be packed in bales, weighing in the case of fibre not more than 4 cwt., of a length of four feet and a width of two feet, and sent to the "grading store". Before despatch the miller has to place inside each bale a tin tag, showing the brand which is registered in his name. Outside the bale and attached to the tin tag by a piece of wire, is a canvas tag on which is similarly inscribed the miller's brand together with the number of the bale. Certain stores in the various ports are specially appointed as grading stores and any hemp which the miller desires to export must be sent to one of the appointed stores at least four clear days before grading is required to be done, and the owner must at the same time give the grader at the store written notice of the quantity submitted. Graders appointed by the Department of Agriculture work to standards laid down in the regulations. The grade of each parcel submitted is determined by

the grader on opening about 5 per cent. of the bales at random or such further number as he considers necessary. No hemp which on being opened out is found to be in a wet or damp condition is graded, but it may be dried and re-submitted. The grader draws hanks from the open bales and it is on his examination of these that the grading is done, the maximum points allotted being 25 each for stripping, scutching, colour and strength. The canvas tags are marked with the grade mark and the grader delivers to the miller or owner of the hemp a certificate which shows the particulars of the bales concerned, the total points awarded and the grade. In the event of any parcel being noticeably of less than average length, the grader inserts the words "short" or "very short" on the certificate. The grader's certificate is usually attached to the shipping documents when the hemp is exported and contracts are carried through on the basis of such certificates. The charge for grading hemp is at present 6d. per bale payable by the owner or the miller.

The grading system is regarded by competent interests as having proved of the utmost value to the industry. It was inaugurated by the Government at the request of the millers. Previously the only grading was done by the merchants or their agents, and abuses reigned in, to the disadvantage both of the miller and also the buyer. The official system has worked well since its inception, and in London contracts the "Government graders' certificates are to be accepted as final" in regard to quality.

147. In the Philippines official grading of manila was introduced in 1915. At the present time regulations covering thirty-two grades* are issued to the official graders by the Fibre Standardisation Board, in which there are representatives of the producers, dealers, exporters and manufacturers. The grading is based on the strength, leaning and colour of the fibre and in addition, texture and length, though they do not determine the grade, may be necessary to identify the type. Hand tests and practical observation by the grader are regarded as sufficient to determine whether the fibre has the average normal breaking strength for its particular kind; if it fails in this respect it is graded as "damaged".

Grading of manila.

148. Mexican henequen has been officially weighed and graded since 1926. One of the grading regulations provides that "the department of Statistics and Classification will always have within its reach an officially certified sample of the various grades and classifications and will hand a similar certified sample to each henequen grower on receipt of the cost of same".

Grading of Mexican henequen.

149. A successful system of grading has been adopted in Mauritius since 1925, though the five grades first introduced, after

Mauritius grading system.

* See Appendix E.

consultation with London merchants, have since been found to be too many. Each producer sends his fibre loosely baled to the factory of the Mauritius Hemp Syndicate. These bales are opened and the fibre sorted and graded. Thereafter the bales are returned to the owner for storage or shipped to his order with a certificate of weight and grade, but if there is more than one grade of fibre in the bale as it is received, the whole bale is classified under the lower quality. Disputes over grading are referred to an Appeal Committee. The Syndicate is confined to grading and baling, for which it charges about 30s a ton, the rate being fixed in advance each year and adjusted on the past year's profit or loss. Not only has this method simplified the grading of Mauritius fibre but it has made it possible to standardise the bales.

Standardised grades needed in East Africa.

150. Nothing comparable to these systems of standardised grading before export exists in East Africa or India. From the evidence put before us by the rope manufacturing interests, we believe that the standardisation of the grading of East African sisal is essential if the fibre is to retain its popularity with spinners. Further, if sisal is at all widely adopted for rope making for marine or other purposes, standardisation of grades will become a necessity. There is at present a rough uniformity between grades adopted by shippers, but the existence of considerable differences is shown by the fact that three classes of East African No. 1 sisal are recognised in the London market. If the producers' associations are unwilling to take steps to establish regular grades and to enforce them, possibly with legal assistance, it would be to the advantage of the industry as a whole if the Governments themselves took the initiative.

Two methods of standardising grades.

151. Either of two methods might be adopted. The first is to grade the fibre at certain selected centres which, in most of the schemes we have described, is the port of shipment. This method is followed in New Zealand and the following figures give the respective costs of grading a ton of fibre and of tow at a typical centre.

Cost of grading a ton (5 bales) of phormium fibre :—

	s.	d.
Drawing hanks		3
Re-pressing bales		10½
Copy of weights, etc.	1	0½
Handling in (3d. a bale)	1	3
Grading charge (6d. a bale)	2	6
	<hr/>	
	5	11
	<hr/>	

Cost of grading a ton (8 bales) of phormium tow :—

	s.	d.
Re-pressing bales	2	6
Copy of weights, etc.	1	8
Handling (3d. a bale)	2	0
Grading charge (4d. a bale)	2	8
	<hr/>	
	8	10
	<hr/>	

While this method might be used in East Africa, its adoption would, partly for geographical reasons, be difficult. Moreover sisal is not doubled before baling like phormium fibre, and it is pressed much tighter so that the cost of re-baling would be more comparable with that of re-pressing the bales of phormium tow.

The second method, which might not always secure such a high degree of uniformity, is to allow the grading to be done on the estates but to make it subject to inspection at any time. This may be found to be the method most suited to conditions in East Africa. Before standard grades are established, it may be necessary to determine the extent of variation between the fibre produced in different districts; and if the range is very large, district grades or marks may be necessary.

152. If grading is not done centrally, once the standards are fixed—and manufacturers insist that four or five grades for sisal including one for tow would be sufficient—the producers would have to be supplied with samples of the various grades. They should then be required to grade to these standards and the grading at the plantation should be liable to inspection at any time. Standardised grading, however organised, would not necessarily involve the abolition of producers' own marks though we believe that if it is properly enforced such marks will become less and less important. In fact the reputation not only of East African sisal as a whole, but also of the individual marks, will be protected by standardised grading. Producers who now secure a small premium for their marks will not lose by this method. Co-operation to promote standardised grading should also facilitate other co-operative activities such as the organisation of collective advertising, which we believe would be advantageous to East African sisal producers.

153. The grading of Indian hems presents a different problem. Grading of
Indian
hemp. Until 1926 the terms of contract were f.a.q. of the season, but this system tended to discourage the manufacturer from using a product of which he could only judge the standard if he were in a position to take delivery of several parcels. The London Hemp Association

therefore established a contract providing for sales to be made f.a.q. of the grade. The setting up of standards which were to remain constant from year to year was a definite advance but no physical standards were prepared, and ideas as to the characteristics to be expected of any grade vary among both sellers and buyers. In such a system inconsistencies are bound to occur. The result is that while some shippers secure a premium on their grading ranging from 5s. to £1 or more a ton, others are subject to numerous claims by buyers.

154. We understand that the London Hemp Association is willing to accept agreed type bales as representing standards. It is suggested that for each growth, i.e., Dewghuddy, Itarsi, etc., three grades should be fixed on a basis of strength, colour, length and general appearance, while the problem of dust might be settled by an allowance fixed in the first instance by an ash content. Typical bales might be sent to London and, if the London Hemp Association accepted them, they would serve as the standard. The adoption of such standard grades should encourage the re-opening of business by a number of shippers who used to export Indian hemp, but have ceased to do so because of the uncertain basis of trading.

VIII. CONCLUSION.

Outlet for
Empire
hemp.

155. Empire countries exported under a fifth and imported just over a fifth of the hemp exported in the years 1928 and 1929 by all producing countries. But since the Empire neither produces any large amounts of true hemp and manila hemp, nor any completely adequate alternatives, it cannot at present be considered self-sufficient in respect of hemp. Interest has recently been taken in the possibility of using Empire fibres—particularly sisal and New Zealand hemp—for marine cordage, for which purpose manila hemp is now almost exclusively used. Trials are being made by the Admiralty and the results should be available in the autumn of 1932. For the present all that can be said is that the immediate outlet for Empire hemp lies most clearly in the market for twines, cords and small ropes.

Specialisa-
tion of
cordage
industries.

156. The United Kingdom cordage industry is the largest in the Empire but its tendency to specialise on large ropes and cables has resulted in more than half of the hemp used being manila. The Canadian industry—the second largest in the Empire—is even more specialised on the manufacture of binder twine. Most of the fibre used in Canada is imported through the United States of America.

In so far as Empire manufacturers, while still meeting all demands made upon them, could use a larger percentage of Empire hemp than they do at present, the granting of preference should stimulate inter-Imperial trade and prove of value to Empire hemp producers. In the United Kingdom, Empire hard hems now

enjoy a 10 per cent. preference. To the extent that the Empire production of certain fibres exceeds the needs of Empire consumers, the producers must in any case meet foreign competition in the rest of the world's markets.

157. The present low levels of hemp prices—much lower than those of the immediate pre-war years—is not necessarily attributable to a world production in excess of normal requirements. A low cost of production is not only necessary to meet present prices but over a long period is peculiarly important to commercially successful hemp production, and is the end to which producers must direct their efforts; for in the uses to which cordage is put, cheapness is the main consideration, provided that the rope, cord, cable or twine is sufficiently strong, durable and flexible.

Need for low costs of production.

158. Though the wider use of the combined harvester-thresher is likely to reduce the demand for binder twine, hitherto the principal outlet for sisal, this hemp fibre is being more widely used for other cordage purposes. The expansion of the Empire production of hemp is the result of rapid post-war expansion in East Africa. The industry there was still growing when the depression began, and consequently the planters have been very severely hit by the drop of 62 per cent. in the sterling price of sisal between December, 1929 and June, 1932. Most of the estates have for some months been working at a considerable loss; and some, which were not favourably placed from the point of view of transport or other costs, have already ceased production. Of the remainder, the less well-managed will have to raise their level of efficiency to that of the best estates if they are to survive the present depression and be prepared for recovery. We are of the opinion that although the whole programme of research which has been prepared cannot be begun immediately, it is not necessary to wait until all the schemes are financially possible. We believe that it would be of immediate value to the estates and Governments if an economic survey of the East African industry were made; we accordingly recommend that such a survey should be undertaken and suggest that the Empire Marketing Board might render some assistance in this project. There is little scientific knowledge of the sisal plant and its economic exploitation, and we therefore hope that the long-range research at the Amani Institute will receive the utmost possible financial support and that as soon as possible a station for cultural experiment, will be started. We regard the adoption of standardised grading for East African sisal as essential, and recommend immediate action by the growers' associations, or failing them, by the local Governments.

East African sisal industry.

159. The sisal industry in the Bahamas has been of great value to the peasants in the past, but production is now very small. Steps are being taken to improve the methods of preparation. We urge

Sisal in the Bahamas.

that attention should at first be concentrated on particular areas, so that steady supplies of better quality fibre may facilitate the better marketing at Nassau, which we consider is essential to any lasting improvement in the position of the industry.

New Zealand
hemp.

160. The production of phormium fibre in New Zealand—once the chief Empire source of hard hemp fibre—has fallen severely. As prices and costs regain stability, production may be expected to increase. The decline in exports has reduced the funds available under the existing research scheme and unfortunately some research has had to be stopped; but we hope that the resumption of this important and necessary work will not be unduly delayed. We are of the opinion that continuous research on the machinery used is likely to be more fruitful than the occasional offer of bonus prizes: and we therefore recommend, for consideration by the New Zealand Government, the appointment of an engineer to deal with the machinery used in the industry. We consider that the possibility of further mechanizing the industry should be explored. We further recommend that an economic survey of the position of the industry be made and that a station be established to carry out cultural experiments and demonstrate the results to the mill-owners.

It is important that the authorities and mill-owners in St. Helena should keep in touch with the research on phormium and the developments in practice in New Zealand.

Indian
sunn hemp.

161. Sunn hemp, which is almost the sole Empire source of soft hemp, is produced in many provinces in India. Exports of sunn have declined in recent years. If sunn hemp is to meet the competition of the hard hemp fibres and of foreign true hemp, the quality of the fibre exported must be improved; this involves the use of better seed, cleaner retting, effective grading and better local marketing. Research is being carried on to secure improved seed strains and to determine the best methods of preparation. We recommend that a co-ordinated programme of research be prepared. In connection with the improvement of methods of cultivation and preparation and the dissemination of the results of research among the cultivators, we draw attention to the discussion in our Report on Cocoa of the possibility of using sound films. Better local marketing of sunn hemp in India, either through co-operative societies or controlled public markets, will be necessary if the other efforts to secure better quality fibre are to have their full effect. We are of opinion that the adoption of agreed type bales for use in London arbitrations would facilitate and encourage the Indian hemp trade.

London
arbitrations
and market
intelligence.

162. We believe that the general use of standard type bales in London hemp arbitrations would give satisfaction to shippers and growers; and we agree with the general principle that the arbitrators and umpire should be appointed by an outside body and make their

award without knowledge of the names of either buyer or seller. We have been impressed by the lack of collated and published information on crops, shipments, arrivals and sales of hemp fibres. We recommend that the Empire Marketing Board should examine the possibility of organising the supply of market intelligence.

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B. N. MITRA	}	India
P. P. GINWALA		
J. W. DOWNIE		Southern Rhodesia
J. E. SHUCKBURGH	}	Colonies and Protectorates
J. H. BATTY		
		D. T. CHADWICK (Secretary)
		LEWIS CROOME (Assistant)

June, 1932

APPENDIX A

TABLE I

Average exports of Hemp 1928 and 1929, from the Principal Producing Countries, showing the types of leaf and bast hemp fibres.

(A) LEAF FIBRES

Kind of Fibre	Exporting Country	Quantity	Value
		tons	£s
		thousands	thousands
Manila Hemp Sisal, Henequen and Maguey	Philippine Islands	179.2	5,652.9
	British East Africa :		
	(i) Kenya (a)	15.1	502.1
	(b)	0.9	22.7
	(ii) Tanganyika	41.0	1,298.5
	(iii) Nyasaland	1.2	32.2
	Bahamas	0.9	15.5
	Jamaica	0.4	9.3
	Gold Coast	0.2	4.4
	Mexico	126.0	3,420.7
	Netherlands East Indies :		
	(i) Java and Madura	24.1	663.1
	(ii) Outer Provinces	30.6	919.0
	Philippine Islands	16.5	
	Portuguese East Africa (a)	5.5	173.0
	(b)	0.9	13.0
	Cuba	2.3	72.1
	Salvador	1.0	38.6
	French West Africa	0.7	19.0
Phormium tenax	New Zealand (a)	12.6	346.4
	(b)	2.6	40.9
	St. Helena (a)	0.8	24.7
(b)	0.4	8.1	
Mauritius hemp	Mauritius	2.4	62.8
	TOTAL	465.3	13,339.0

(B) BAST FIBRES

Kind of Fibre	Exporting Country	Quantity	Value	
True hemp (Cannabis sativa)	Belgium	(a)	8.1	392.3
		(b)	1.4	37.4
	Hungary	(a)	2.2	77.0
		(b)	1.3	49.4
	Italy	(a)	51.6	3,153.9
		(b)	14.6	631.2
	Lithuania		13.2	?
	Poland	(a)	0.2	5.9
		(b)	3.6	72.5
	Soviet Union (Russia)		9.9	362.6
	Yugo-Slavia	(a)	6.1	203.3
		(b)	1.0	20.5
	Other countries	(a)	1.4	71.0
		(b)	1.2	41.7
		Total true hemp	115.8	5,118.7*
Sunn hemp	British India	24.9	592.7	
	TOTAL	140.7	5,711.4*	

* Excluding Lithuania

NOTE: (a)=Hemp, (b)=hemp tow. Certain countries do not distinguish between hemp and hemp tow in their Trade Returns. It can be assumed that the figure given in these cases is for both hemp and hemp tow.

TABLE 2

Exports of Agave Fibres from producing Countries, 1925-31

Country	Kind	1925	1926	1927	1928	1929	1930	1931
		In thousand tons						
British East Africa	Sisal	33.4	40.5	49.7	53.9	62.6	67.2	72
Bahamas	Sisal	2.3	1.7	0.6	0.9	0.9	0.3	-
Jamaica	Sisal	0.2	0.3	0.2	0.3	0.4	0.1	(a)
Ceylon	Sisal	0.2	0.3	0.2	—	—	—	-
Gold Coast (b)	Sisal	0.2	0.5	0.3	0.1	0.2	0.3	-
Total British Countries		36.3	43.3	51.0	55.2	64.1	67.9	-
Mexico		129.3	103.7	124.9	138.0	113.9	59.4	66
Netherlands								
East Indies								
(i) Java and Madura	Sisal	15.4	16.2	18.0	22.8	25.4	23.2	24
(ii) Outer Provinces	Sisal (c)	19.0	21.5	28.3	27.7	33.5	42.7	45
Philippine Islands	Maguey	23.9	17.6	17.3	16.9	15.8	13.3	6
	Sisal	0.4	0.4	0.2	0.1	0.1	0.2	0
Portuguese East Africa	Sisal	3.1	3.2	4.1	6.0	7.3	11.4	9
Cuba	Sisal	1.4	3.4	1.4	1.5	3.1	(a)	(a)
Salvador	Henequen	0.7	0.8	0.7	0.9	1.0	0.9	(a)
French West Africa	Sisal	0.4	0.6	0.5	0.7	0.8	0.8	(a)
Total Foreign Countries		193.6	167.4	195.4	214.6	200.9	151.9(d)	-
TOTAL		229.9	210.7	246.4	269.8	265.0	219.8(d)	-

(a) Not available

(b) Last shipment made July, 1930, the Government sisal plantation having been closed down

(c) Principally sisal but also includes manila hemp

(d) Excluding Cuba

TABLE 3

United Kingdom Imports and Re-exports of Hemp (not dressed, dressed and tow), showing the Empire share in Gross Imports, 1919-30 with the average figures for 1912-3 (in thousand tons)

Year	Gross Imports				Re-exports	Retained	Percentage of Gross Imports retained
	Empire countries	Foreign countries	Total	Empire percentage			
1919	54.1	66.8	120.9	44.7	45.3	75.6	62.5
1920	33.4	111.1	144.5	23.1	44.7	99.8	69.1
1921	18.7	39.6	58.3	32.1	23.9	34.4	59.0
1922	22.6	56.9	79.5	28.4	26.1	53.4	67.2
1923	15.8	77.5	93.3	16.9	25.1	68.2	73.1
1924	22.9	85.9	108.8	20.1	26.1	82.7	76.1
1925	29.7	70.7	100.4	29.6	28.8	71.6	71.3
1926	26.9	57.7	84.6	31.8	27.4	57.2	67.6
1927	25.9	75.6	101.5	25.5	19.4	82.1	80.9
1928	23.4	70.6	94.0	24.9	19.3	74.7	79.5
1929	20.3	73.8	94.1	21.6	18.4	75.7	80.4
1930	15.6	67.8	83.4	18.7	14.3	69.1	82.9
1924-30 (average)	23.5	71.7	95.2	24.7	21.9	73.3	77.0
1912-13 (average)	41.8	106.5	148.3	28.2	53.4	94.9	64.0

TABLE 4

United Kingdom Gross Imports of Hemp (not dressed, dressed and tow) showing the principal kinds of hemp and the Countries from which they were consigned 1924-30 with average figures for 1912-3

	1912-13 average	1924	1925	1926	1927	1928	1929	1930
	Thousand tons							
Manila								
Philippine Islands	73.9	63.7	55.6	40.8	49.9	50.9	50.6	50.2
Sisal								
British East Africa	0.1	8.1	10.6	8.1	8.9	8.9	7.2	6.2
British West Africa	—	0.1	0.2	0.4	0.3	0.1	0.1	0.1
Portuguese East Africa	—	1.0	1.3	0.8	0.3	0.5	0.6	0.7
Mexico	0.8	0.9	—	—	0.7	—	0.4	—
Java	0.1	0.3	0.7	0.7	0.3	0.4	0.4	0.9
New Zealand hemp								
New Zealand	22.8	5.2	8.1	8.7	8.8	8.3	5.3	3.5
St. Helena	—	1.0	1.1	1.2	1.1	0.8	1.4	1.0
Mauritius hemp								
Mauritius	2.2	0.2	0.7	1.4	0.5	0.2	0.5	0.4
Hemp (<i>Cannabis sativa</i>)								
Italy	9.0	8.4	5.9	8.8	13.6	7.7	10.3	7.8
Latvia	—	1.5	0.6	0.6	1.7	0.8	1.1	0.6
Soviet Union (Russia)	15.7	1.6	1.0	0.3	0.4	0.9	0.4	0.5
Yugo Slavia	0.5	—	—	0.3	0.4	0.1	—	0.1
Indian hems								
British India	15.8	7.4	8.5	6.0	5.1	3.8	5.0	3.9
Unidentified								
Belgium	0.3	2.8	2.2	2.0	2.5	3.0	3.9	1.3
Germany	3.9	0.2	0.2	0.7	1.6	1.8	2.3	2.5
Netherlands	—	0.5	0.6	0.7	1.1	0.8	1.1	1.1
United States of America	0.8	3.2	0.7	0.1	1.3	1.9	1.3	0.1
Other British Countries	0.9	1.0	0.5	1.2	1.2	1.3	0.8	0.5
Other Foreign Countries	1.5	1.7	1.8	1.8	1.8	1.8	1.4	2.0
Total	148.3	108.8	100.3	84.6	101.5	94.0	94.1	83.4

TABLE 5

Summary of United Kingdom Imports of Hemp and Hemp tow
1931 and for the first five months of 1932*

	Twelve months 1931	Five months 1932
Hemp	Thousand tons	Thousand tons
From Italy	6.1	3.7
" Phillipine Islands	43.4	11.8
" British East Africa	8.9	6.3
" British India	1.8	1.4
" New Zealand	0.4	0.3
" Other Countries	17.1	5.4
Total	77.7	28.9
Hemp tow		
From Italy	3.0	1.3
" Other Countries	3.9	1.5
Total	6.9	2.8

* Provisional figures

TABLE 6

Production of Cordage and Manufactures of Cordage in Great Britain in 1930 and 1924 and in the United Kingdom in 1924

(A) CORDAGE

Kind of Goods	Great Britain 1930		Great Britain 1924		Great Britain and Northern Ireland 1924	
	Quantity	Value	Quantity	Value	Quantity	Value
Cordage, cables ropes and twine, under $\frac{1}{4}$ inch diameter :—	Th. cwts.	£'000	Th. cwts.	£'000	Th. cwts.	£'000
Of hemp :—						
Binder and reaper twine	148.1	359	281.4	756	358	983
Other sorts of cordage and twine under $\frac{1}{4}$ inch diameter :—						
Of Manila and other hard hems	155.1	435	} 287.6	1,258	} 375	1,693
Of Italian and other soft hems	102.1	456				
Of cotton	102.2	630	} 139.3	1,153	} 208	1,401
Of jute	26.3	65				
Of flax and other materials (including mixtures)	13.5	79				
TOTAL — Cordage, etc., under $\frac{1}{4}$ inch diameter	547.3	2,024	708.3	3,167	941	4,077
Cordage, cables, ropes and twine of $\frac{1}{4}$ inch diameter and over :—						
Of Manila and other hard hems	692.8	1,619	} 678.2	1,969	} 769	2,211
Of Italian and other soft hems	66.2	254				
Of cotton	46.4	279	} 71.8	617	} 78	657
Of jute	57.9	117				
Of flax and other materials (including mixtures)	35.7	51				
TOTAL—Cordage, etc., of $\frac{1}{4}$ inch diameter and over	899.0	2,320	928.5	3,070	1,056	3,418

(B) MANUFACTURES OF CORDAGE

Nets of hemp	{ 48.1	346	} 55.3	857	} 71	1,031
	{ —	68				
Nets of cotton	{ 13.8	271				
	{ —	123	} 11.3	52	} 15	72
Nets of flax	{ 1.4	95				
Other manufactures (hammocks, etc.)	{ —	12				
TOTAL VALUE — Manufactures of cordage		915		909		1,103
TOTAL VALUE—Cordage and manufactures thereof.		5,259		7,146		8,598

TABLE 7

United Kingdom Exports and Net Imports of Hemp
Yarn and Products, 1924-30*

Year	Hemp	Yarns	Hemp Cordage, Cables, Rope and Twine			Manufactures of Cordage		
	Line	Tow	under $\frac{1}{4}$ inch diameter		$\frac{1}{4}$ inch diameter and over	Total	Nets	Others
			Binder twine	Other sorts				
Exports (1,000 cwts.)								
1924	4.0	9.5	118.9	68.2	172.2	359.3	19.1	0.6
1925	2.5	7.6	22.9	64.0	161.1	247.1	25.4	1.0
1926	3.3	4.4	48.7	57.8	191.2	297.7	25.2	0.7
1927	3.6	7.8	49.8	60.6	201.7	312.1	26.9	1.7
1928	6.5	5.7	51.9	50.6	243.6	346.1	33.1	1.5
1929	4.5	5.9	46.9	48.7	275.5	371.1	34.5	0.8
1930	2.9	3.8	54.7	46.4	201.9	303.0	31.9	0.8
Exports to British countries (per cent. of above)								
1924	25	23	26	53	35	35	40	83
1925	44	29	44	54	34	42	40	70
1926	42	48	26	58	34	38	49	71
1927	39	35	27	52	35	37	41	65
1928	34	40	54	56	33	39	45	33
1929	58	36	64	62	30	39	45	50
1930	60	44	59	55	39	45	44	66
Net Imports (1,000 cwts.)								
1924	37.3	49.2	103.7	63.3	14.7	181.7	7.3	0.5
1925	25.3	47.0	95.4	59.0	27.2	181.6	4.3	0.3
1926	21.3	46.9	77.4	95.3	37.2	209.9	3.1	0.3
1927	28.3	60.1	71.6	105.1	37.8	214.5	2.7	1.2
1928	20.7	47.2	99.1	100.6	39.6	239.3	3.7	0.7
1929	14.4	42.2	59.0	119.6	47.6	225.2	3.6	2.4
1930	11.4	39.5	82.4	143.9	31.2	257.5	4.0	0.8

* Net Imports = Gross Imports less re-exports.

TABLE 8
Exports of Hemp Fibres from Empire Countries for calendar years 1925-31
(Thousand tons)

Year	Sisal					New Zealand hemp		Mauritius hemp	Total hard hemp fibres	Sunn hemp	Total all hemp fibres
	Tangan-yika	Kenya	Nyasa-land	Bahamas	Jamaica	New Zealand	St. Helena	Mauritius		British India	
1925	18.3	14.4	0.8	2.3	0.2(a)	19.9	1.3	1.9	59.1	33.8	92.9
1926	25.0	14.9	0.5	1.7	0.3(a)	20.8	1.2	2.5	66.9	23.8	90.7
1927	33.0	15.8	0.8	0.6	0.2(a)	19.6	1.1	1.9	72.9	25.6	98.5
1928	36.2	16.5	1.2	0.9	0.3	15.7	1.2	2.4	74.5	25.2	99.7
1929	45.7	15.6	1.2	0.9	0.4	14.7	1.4	2.5	82.4	24.5	106.9
1930	50.0	15.9	1.3	0.3	0.1	9.5	0.9	1.4	79.4	17.8	97.2
1931	55.9	16.0	0.2	(b)	(c)	2.4	0.9	(c)	75.4(d)	12.2	87.6(d)
Average	37.7	15.6	0.9	0.9	0.2	14.7	1.1	2.1	73.2	23.3	96.5

(a) Converted from bales (estimated as 2½ cwts. each)
 (b) 21 tons

(c) Not available
 (d) Excluding Jamaica and Mauritius

TABLE 9

Domestic Exports of Sisal and Sisal Tow from British East Africa for calendar years 1925-31, showing the principal countries to which consigned

Country	1925	1926	1927	1928	1929	1930	1931
	tons	tons	tons	tons	tons	tons	tons
(i) From Tanganyika :—							
United Kingdom	5,238	5,164	5,509	3,117	2,018	1,440	2,938
Kenya	238	584	531	1,268	801	222	205
Union of South Africa	81	291	363	335	51	97	364
Other British Countries	976	409	6	35	—	804	102
Belgium	5,798	10,707	16,548	21,275	31,422	36,863	41,250
Germany	3,602	3,562	6,993	3,846	3,311	3,296	3,039
Holland	58	2,375	2,060	891	3,349	4,951	2,655
Italy	194	510	308	514	735	595	1,303
United States of America	1,990	1,359	505	4,752	3,810	625	1,710
Other Foreign Countries	101	61	189	153	231	1,069	2,373
TOTAL	18,276	25,022	33,012	36,186	45,728	49,962	55,939
(ii) From Kenya :—							
United Kingdom	7,300	6,520	5,656	6,073	3,430	3,297	1,587
Union of South Africa	254	173	162	306	222	200	170
Other British Countries	34	23	90	10	47	25	65
Belgium	4,543	5,761	5,854	5,843	8,358	9,980	10,868
Germany	554	686	1,062	457	70	4	982
Italy	39	154	119	189	529	541	494
United States of America	1,566	1,496	900	3,118	2,653	1,163	786
Other Foreign Countries.	73	1,115	996	520	338	737	1,042
TOTAL	14,363	14,928	15,839	16,516	15,647	15,947	15,994
(iii) From Nyasaland :—							
United Kingdom	675	514	801	1,162	1,200	1,284	242
Foreign Countries	110	15	—	—	—	—	—
TOTAL	785	529	801	1,162	1,200	1,284	242
TOTAL—BRITISH EAST AFRICA.	33,424	40,479	49,652	53,864	62,575	67,913	72,175

TABLE 10

Domestic Exports of Sisal and Sisal waste from the Bahamas and Jamaica for calendar years 1925-31, showing the principal countries to which consigned

Country	1925	1926	1927	1928	1929	1930	1931
	tons	tons	tons	tons	tons	tons	tons
(i) From the Bahamas:							
United Kingdom	—	—	—	116	57	32	—
Canada	—	16	32	43	61	24	1
United States	2,231	1,721	565	556	510	240	20
Other Foreign Countries	75	5	—	187	234	6	—
TOTAL	2,306	1,742	597	902	862	302	21
(ii) From Jamaica*							
United Kingdom	69	116	9	47	5	39	
United States of America	170	164	150	214	260	31	
Other Countries	—	14	29	83	176	4	
TOTAL	239	294	188	344	422	74	

* Figures for 1925-27 converted from bales (estimated as 2½ cwts. each)
 Figures for 1931 not yet available.

TABLE 11

Exports of Phormium fibre and tow from New Zealand for calendar years 1925-30, showing the principal countries to which exported

Country	1925	1926	1927	1928	1929	1930
	tons	tons	tons	tons	tons	tons
United Kingdom	8,307	4,598	8,019	6,904	4,746	2,346
Canada	297	338	210	404	322	170
Australia	5,309	5,201	4,719	4,274	4,353	3,320
Belgium	165	1,016	747	250	121	98
France	142	779	356	163	106	127
Germany	289	393	497	148	124	102
Netherlands	125	2,080	109	26	66	145
United States of America	5,289	6,363	4,937	3,502	4,877	3,185
Other Countries	—	10	6	12	5	—
TOTAL	19,923	20,798	19,600	15,683	14,720	9,493

TABLE 12

Exports of Mauritius hemp from Mauritius for calendar years 1925-30, showing the principal countries to which exported

Country	1925	1926	1927	1928	1929	1930
	tons	tons	tons	tons	tons	tons
United Kingdom	426	801	890	477	938	172
Belgium	1,152	1,195	582	608	768	661
France	103	304	272	248	247	248
Germany	186	219	69	98	20	5
Spain	—	2	40	131	68	140
United States of America	—	—	20	853	414	217
Other countries	—	15	1	5	—	2
TOTAL	1,867	2,536	1,874	2,420	2,455	1,445

TABLE 13

Exports of Hemp (chiefly sunn) from British India for calendar years 1925-31.

Country	1925	1926	1927	1928	1929	1930	1931
	tons	tons	tons	tons	tons	tons	tons
United Kingdom	7,367	3,995	3,954	3,061	3,326	2,726	1,290
Germany	4,315	1,893	2,445	2,868	2,861	1,744	512
Belgium	15,113	12,648	14,652	12,267	11,763	8,144	7,193
France	2,364	1,533	704	1,269	902	1,122	621
Italy	1,855	517	843	2,892	1,978	885	89
United States of America	1,360	2,154	1,108	1,312	1,227	488	685
Other Countries	1,433	1,087	1,870	1,569	2,469	2,713	1,844
TOTAL	33,807	23,827	25,576	25,238	24,526	17,822	12,235

TABLE 14

(A) *Average Monthly Price per ton (c.i.f. London) for certain grades of soft hemp fibres 1929-32*

Month	Italian— P.C/S.B.	Russian Siretz Group I, Sort I	Indian Sunn Hemp	
			Fine Jubbelpore (H.J.F.)	No. 2 Benares
1929—	£ s.	£ s.	£ s.	£ s.
January	66 10	55 0	28 10	23 5
February	65 0	55 0	28 10	23 5
March	66 15	55 0	28 0	23 15
April	63 0	53 0	27 0	22 15
May	61 0	53 0	27 10	22 0
June	57 15	52 0	26 10	22 0
July	57 10	50 0	27 0	22 0
August	58 0	50 0	27 0	22 0
September	58 0	50 0	27 0	22 10
October	57 5	50 0	27 0	23 5
November	55 10	53 0	26 10	22 0
December	54 10	50 0	26 0	21 0
1930—				
January	53 0	48 0	24 0	20 0
February	50 15	46 0	22 0	20 10
March	49 10	42 0	20 10	19 15
April	51 0	40 0	21 0	21 0
May	51 10	38 0	20 15	21 10
June	49 0	38 0	21 0	20 10
July	48 0	35 0	21 0	17 15
August	45 10	34 0	20 15	16 10
September	42 0	30 10	20 5	16 5
October	37 15	27 10	20 0	15 10
November	35 0	27 0	19 0	15 0
December	33 10	27 0	16 0	13 5
1931—				
January	30 10	26 0	13 15	12 10
February	29 0	26 0	13 10	11 15
March	30 5	26 0	14 10	13 0
April	32 0	26 0	15 10	14 15
May	31 10	26 0	14 5	14 0
June	30 5	26 0	14 5	13 5
July	30 10	27 0	14 5	13 5
August	30 10	27 0	14 5	12 0
September	32 0	26 0	14 5	11 15
October	36 10	27 10	15 5	13 0
November	37 0	28 0	16 10	14 5
December	40 10	33 0	17 5	13 17½
1932—				
January	41 10	37 5	16 15	13 5
February	43 0	38 0	15 10	12 10
March	42 5	37 0	15 0	12 15
April	42 10	37 0	14 15	13 0
May	44 15	36 15	14 5	12 5
June	44 0	34 0	14 0	12 2½

TABLE 14

(B) *Average Monthly Price per ton (c.i.f. London) of certain grades of hard hemp fibres 1929-32*

Month	Manila—J2	East African Sisal—No. 1	New Zealand hemp— High Fair	Mauritius— Prime
1929	£ s.	£ s.	£ s.	£ s.
January	40 0	43 0	37 0	39 10
February	35 10	42 10	36 0	39 10
March	37 10	40 0	35 10	39 0
April	38 0	39 5	33 10	38 5
May	37 0	37 10	33 10	37 10
June	38 0	39 0	33 0	37 10
July	38 0	39 10	33 10	37 5
August	38 10	40 0	33 10	37 0
September	37 10	40 0	33 10	36 0
October	36 5	39 0	34 0	35 5
November	34 0	37 10	34 0	34 15
December	36 0	36 0	33 10	33 15
1930				
January	35 0	36 0	33 0	33 0
February	32 0	34 10	31 0	32 10
March	29 10	34 0	31 10	32 0
April	29 10	35 10	30 0	32 0
May	26 0	31 0	30 0	30 10
June	24 0	28 0	26 0	29 0
July	24 10	24 15	25 0	28 0
August	23 0	24 0	24 10	25 10
September	22 0	22 0	24 5	25 0
October	24 5	21 5	24 7½	25 10
November	24 5	21 10	25 10	24 15
December	23 15	21 0	26 0	24 5
1931				
January	20 0	18 0	23 15	23 0
February	18 5	16 15	21 0	23 0
March	18 5	16 0	20 10	22 10
April	19 0	16 10	20 15	22 10
May	17 5	16 5	20 10	22 10
June	18 0	15 10	20 10	22 10
July	18 0	15 0	20 5	23 0
August	16 10	13 5	19 15	22 0
September	18 5	15 0	20 5	21 10
October	20 0	16 0	20 10	25 0
November	21 10	17 0	20 10	24 0
December	20 0	16 5	20 0	24 0
1932				
January	19 10	15 5	19 10	22 10
February	20 10	15 0	18 15	22 10
March	19 0	14 10	18 5	22 10
April	18 0	14 10	17 0	22 10
May	17 5	13 15	16 16	22 10
June	17 10	13 7½	16 10	22 10

APPENDIX B

CHARGES ON HEMP IN THE PORTS OF LONDON, ANTWERP AND
HAMBURG IN AUGUST, 1914 AND MARCH, 1932

(1) PORT OF LONDON

	August, 1914	March, 1932 <i>Actual</i>	March, 1932 <i>Converted to a gold basis</i>	June, 1932 <i>Actual</i>
	per ton s. d.	per ton s. d.	per ton s. d.	per ton s. d.
EAST INDIAN, in press packed bales				
Port rates, lighterage (if incurred), landing, weighing 10 per cent., opening for Customs' inspection, sorting for damage and delivery	7 4	14 8	10 11·2	14 7
Rent per week	3·1	5·7	5	5·7
MANILA, in press packed bales				
Port rates, lighterage (if incurred), landing, weighing 10 per cent., opening for Customs' inspection, sorting for damage and delivery	8 4	17 3	12 10·3	17 2
Rent per week	4·1	7·1	5·3	7·1
NEW ZEALAND, in bales				
Port rates, lighterage (if incurred), landing, weighing, sorting for damage, classing the damages, taring, sampling and opening for Customs' inspection	8 4	17 3	12 10·3	17 2
Delivery to land conveyance	2 8½	5 5	4 0·5	5 5
Delivery to water conveyance	4 3½	8 1	6 0·3	8 1
Rent per week	4·1	7·1	5·3	7·1
SISAL, EAST AFRICAN, in bales				
Port rates, lighterage (if incurred), landing weighing 10 per cent., opening for Customs' inspection and delivery	} No rates pro- vided	17 3	12 10·3	15 11
Port rates, lighterage (if incurred), landing, weighing the whole parcel, opening for Customs' inspection and delivery		21 6	16 0·4	18 0
Rent per week		11·4	8·5	8·55

(2) PORT OF HAMBURG

	August, 1914	March, 1932
	per ton s. d.	per ton s. d.
EAST INDIAN, in pressed bales		
Quay dues, transport costs, 10 per cent. weighing, opening for inspection, delivery to and from warehouse	6 11	10 10
Warehouse rent <i>per month</i>	0 6	1 6
MANILA, in pressed packed bales	as above	as above
NEW ZEALAND, in bales		
Quay dues, transport costs, weighing, taring, opening for inspection, delivery to and from warehouse	8 2	14 5
Warehouse rent <i>per month</i>	0 7½	1 11
SISAL—EAST AFRICAN, in bales		
Quay dues, transport costs, 10 per cent. weighing, opening for inspection, delivery to and from warehouse	7 6	13 5
Quay dues, transport costs, weighing the whole parcel, opening for inspection, delivery to and from warehouse	8 2	14 5
Warehouse rent <i>per month</i>	0 7½	1 11

The above charges are converted from German currency into sterling equivalent at par.

Notes to the above by H.M. Consul-General at Hamburg :

(1) In connection with the charges for warehousing rent, no official pre-war rates are available as the State Warehousing Company did not accept flax, hemp and jute in view of the insurance premium. The rates given for 1914 are therefore based upon private warehouse charges.

(2) The figures given are based upon the quay due and transport rates fixed for the movement of 10 ton lots which represents a normal post war parcel.

(3) The 1914 figures for Sisal are only approximate.

(3) PORT OF ANTWERP

No distinction is made between the various classes of Hemp mentioned and the figures given below apply equally to the following descriptions of Hemp :—

- (1) East Indian, in press packed bales.
- (2) Manila, in press packed bales.
- (3) New Zealand, in bales.
- (4) Sisal, East African, in bales.

The organisation and local customs being different from those prevailing in London, it is not possible to quote figures on exactly the same basis as those given for the Port of London.

For the following figures, all conversions have been made at par.

Landing Charges

	August, 1914	March, 1932
(a) Reception of the goods	1s. 5d. per ton (Fr. 1.75 per 1,000 kilos.)	1s. 3½d. per ton (Fr. 11 per 1,000 kilos.)
(b) Watching charges	2s. 4½d. (Fr. 3) per 24 hours	5s. 8½d. (Fr. 50) per 24 hours for first 5 days 8s. 0d. (Fr. 70) per 24 hours thereafter (Subject to 2 days exemp- tion, the minimum charge is for 3 days)
(c) Sampling	From ½d. to 1d. (Fr. 0.05 to Fr. 0.10) per bale	From ½d. to ¾d. (Fr. 0.20 to Fr. 0.40) per bale or per day at contract prices to be agreed upon
(d) Warehousing	Figures not obtainable	2s. 7½d. (Fr. 23) for ordinary carting to ware- house 2s. 11½d. (Fr. 26) for carting and weighing

Port Dues

Goods landed may remain on quay free of charge for 5 working days, dating from the day following unloading.

Goods to be loaded may remain on quay free of charge for five working days before the ship commences to load, and also during the actual loading.

Goods which it has not been possible to put on board also enjoy free storage for one working day. The same goods may only enjoy a second and last time the freedom from charges mentioned in the preceding paragraph.

Goods were liable, subject to these periods of exemption, to the following charges while remaining under cover on the quay:—

	August, 1914	March, 1932*
	(Charge per square metre per day)	
(i) During the first 10 days (in March, 1932, including the 5 days of exemption mentioned above)	1/10d. (2 centimes)	1/16d. (5 centimes)
(ii) During the second 10 days	½d. (10 centimes)	1/5d. (15 centimes)
(iii) For the remaining days	1d. (20 centimes)	1/3d. (25 centimes)

* In addition to the charges set out here, the total amount charged was increased by 50 per cent.

Goods left on the open quay (not under cover) paid half the above rates both in 1914 and 1932.

APPENDIX C

PROGRAMME OF SCIENTIFIC AND AGRICULTURAL INVESTIGATIONS REQUIRED
FOR THE SISAL INDUSTRIES IN EAST AFRICA

I. GENETICS

1. The raising of large numbers of seedlings to determine the range of variation available for selection.
2. Exploration of the possibilities of inducing seed production by (a) altitude, (b) mutilation.
3. The introduction, if they can be found, of new strains, and if success is attained under (2) their crossing to secure greater variation in the seedlings.
4. The production, if possible, of inter-specific hybrids.
5. Determination of the effects, if any, of vegetative selection as at present practised.

II. PHYSIOLOGY

1. The study of the factors which influence poling.
2. Comparison of the number of leaves produced, and their rate of production, during the total life of the plant under differing conditions of soil and climate.
3. Measurement of variation in the length of leaf, percentage of fibre, and total fibre under differing conditions and the production of fibre in the plant and amount of fibre and quality at different stages of growth.

III. SOIL SCIENCE

1. Examination of the profiles of typical sisal plantation soils, and their correlation with : (a) general vigour and productivity ; (b) the variations in behaviour observed in the physiological investigations. (II. 1, 2 and 3).
2. Examination of the changes taking place in sisal field soils under continued cropping.

IV. AGRONOMY

- (a) Primary Fields :
 1. Comparison of results from planting with bulbils and suckers.
 2. The examination of spacing experiments with reference to yield, ease of cultivation, and convenience of handling in the primary and secondary stages.
 3. Trials of cover crops, in comparison with weeding at short and longer periods.
 4. Trials of inter-crops.
 5. Manurial trials.
 6. Experiments to ascertain the results of different systems of cutting.
- (b) Secondary Fields :
 7. Trials of different systems of controlling regeneration by suckers.
 8. Determination of the period in the history of a field when replanting is desirable.
 9. Study of the prospects of replanting on land previously under sisal, i.e., the length of fallow (or rotation) if any, that is necessary or desirable.

V. EXTRACTION OF FIBRE

1. Studies of fibre extraction under factory conditions.
2. Investigations of possible mechanical improvements.

APPENDIX D

SUMMARY OF RECOMMENDATIONS FROM THE REPORT ON
HEMP MARKETING IN INDIA

1. Sunn hemp should be grown on light well-drained soils.
2. There is considerable scope for improvement in the existent strains. Improved strains with higher yield and better quality fibre can and should be evolved by "selection."
3. The need for ensuring supplies of pure good seed with instructions about the seed rate for each tract has been clearly established.
4. Cultivators in Bengal should be educated to cut off the root and top portions from the plants before retting; similarly, cultivators, in Ratnagiri district (Bombay Presidency) should be advised to cut the root portions of the plants before retting.
5. The advantages of drying the harvested crops as practised in Ratnagiri district (Bombay Presidency) should be investigated.
6. Instructions should be given to cultivators regarding the proper time and method of harvesting, retting and extraction of fibre and efforts should be made to improve facilities for washing the fibre where these are deficient.
7. The vertical and twisting actions of the retted bundles during washing as practised in the United Provinces and beating of the retted material during extraction as practised in some parts of Bengal are undesirable.
8. The practicability of improving the quality of sunn hemp fibre by 'sweating' should be investigated.
9. The practice of leaving sticks and dirt in the fibre and of twisting it tightly into hanks which serve to hide "loading" should be discouraged.
10. The experiments undertaken at the Technological Institute, Cawnpore, by Mr. Mullani on retting and softening the fibre with cheap chemicals are promising and the authorities of the Institute might be encouraged to continue them.
11. The possibilities of breaking and scutching green as well as retted stems, by hand and power machines, should be investigated.
12. It is desirable to study the effects of the season of growth, and of harvesting and retting practices on the fibre with a view to improvements.
13. The practicability of regulating up-country market on the lines of cotton and grain markets in Berar and of introducing standard iron weights by legal prescription should be investigated.
14. Co-operative Sale Societies and philanthropic bodies should be encouraged to help in ameliorating the condition of the cultivators.
15. The practicability of controlling the transport from one growing centre to another through trade organisations should be considered.
16. The economy and benefit of cleaning and assorting the fibre at the up-country collecting centres before it is made into *kutch*a bales or bundles should be brought home to all concerned.
17. Supervision over *kutch*a baling at the up-country markets will help to minimise some of the defects and malpractices and is not only desirable but necessary.
18. If suitable supervision over the cleaning, grading and packing of the fibre for export could also be provided, it would undoubtedly help to reduce the defects and malpractices. Shivpur (near Benares) being one of the important centres for baling, experiments should be tried there.
19. The Central Provinces which rank next in importance to the United Provinces in sunn hemp production should have arrangement for *pucca* baling. Seoni might prove to be a suitable centre for hydraulic pressing.
20. A reliable and uniform system of grading and specification of the grades is very desirable in the general interests of the trade and efforts should be made to evolve a suitable system through the trade itself.
21. Bales should bear the name of the grade, the place of production and the name of the press. The shipper's own trade marks may of course continue.

22. Supervision over cleaning, grading and packing at the presses at the ports through some permanent organization is essential.

23. Packing for export at the up-country baling centres like Shivpur should be encouraged by giving special transport facilities.

24. Indian shippers complain that the terms of the form of the contract at present in use when hemp is exported are one-sided and are frequently unfair in their operation. An attempt should be made to bring about their revision.

25. A study of the foreign centres of production and markets for hemp is desirable before any defective scheme for the improvement of the Indian trade can be evolved.

26. A permanent central organisation on the lines of the Indian Central Cotton Committee is necessary to effect improvements in the preparation and marketing of sunn hemp and to put the Indian hemp trade on a sound footing.

27. The industrial utilisation in India of sann hemp, e.g., the manufacture of ropes, matting, canvas, etc., offers a promising field which should not be left out of the scope of work entrusted to any central organisation which may be set up.

APPENDIX E

THE STANDARD GRADES OF MANILA HEMP

The group of grades to which fibre belongs is determined by the "cleaning," which depends on the number of serrations on the stripping knife and on the tension of the knife on the cleaning block. The grading within each group is determined by the colour of the fibre.*

The grades are as follows :—

Fibre of excellent cleaning :	Grades A, B, C, D, E, F, S1, S2, S3.
Fibre of good cleaning :	Grades G, H, I, J1.
Fibre of fair cleaning :	Grades J2, K, M1.
Fibre of coarse cleaning :	Grades L1, L2, M2, DL, DM.
Damaged fibre :	Grades Y1, Y2, Y3, Y4.
Strings :	Grades O1, O2, O3.
Tow :	Grades T1, T2, T3.
Waste :	Grade W.

In addition, there are several grades of decorticated fibre and one of fibre prepared with oil.

* See "The Standard Grades of Abacá—their causes, origin and influence on production" M. M. Saleeby. Fibre Standardisation Board, Manila, 1930.

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Reports of the
Imperial Economic Committee
Twenty-Sixth Report
CONSTITUTION AND WORK
1932

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NOTE—The cost of the Committee's enquiries up to 31 March, 1932, has been £20,250. It has prepared 26 reports (including the present volume). In addition, the cost of printing and publishing this report is estimated by the Stationery Office to be £25.

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Twenty-Sixth Report:
Constitution and Work

1932

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REPORT

I. INTRODUCTION

1. We, the Imperial Economic Committee, appointed by the Governments of the United Kingdom, the Dominions, India, and the Colonies and Protectorates, beg leave to present to the Governments of the Empire this our twenty-sixth Report: The Constitution and Progress of Work of the Imperial Economic Committee up to June, 1932.

2. Since the war of 1914-19 the nations of the world have been gradually compelled by the logic of events to recognize the need for economic consultation. The need is even more strongly felt when a group of nations, such as the nations constituting the British Empire, are seeking close economic co-operation. At each Imperial Conference since the war these problems have assumed increasing importance. This course of events has been reflected in the development of the Imperial Economic Committee and in the nature of the work which successive Imperial Conferences have referred to it.

II. DEVELOPMENT OF THE TERMS OF REFERENCE

3. The project of an Imperial Economic Committee dates from the Imperial Economic Conference of 1923. The Committee was brought into being in March, 1925, with very restricted terms of reference. At each succeeding Imperial Conference—in 1926 and again in 1930—the functions of the Committee were extended.

4. At the Imperial Economic Conference of 1923, most of the representatives were in favour of a resolution in the following terms:—

(i) It is desirable to establish an Imperial Economic Committee, comprising representatives of the Governments represented in the Imperial Conference, and responsible to those Governments.

(ii) The function of the Committee should be to consider and advise upon any matters of an economic or commercial character, not being matters appropriate to be dealt with by the Imperial Shipping Committee, which are referred to it by any of the constituent Governments, provided that no question which has any reference to another part of the Empire may be referred to the Committee without the consent of that other part of the Empire.

It was intended that the Committee should be an advisory body, that its members should be appointed by the several Governments of the Empire, and that the reports should be addressed to the Prime Ministers of the Empire and to the Secretaries of State for India and for the Colonies.

5. During 1924, discussions were conducted between His Majesty's Government in the United Kingdom and the other Governments of the Empire to determine the directions in which a Committee so constituted could best serve the interest of the Empire as a whole, and in the late summer of that year the Secretary of State for the Colonies, the Right Honourable J. H. Thomas, M.P., was able to state that the support of all the Governments had been obtained for the setting up of such a Committee to work provisionally and with a specific reference. A General Election intervened in the United Kingdom before further action could be taken, and it was not till 17th December, 1924, that the Prime Minister, the Right Honourable Stanley Baldwin, M.P., announced in the House of Commons that, with the consent of all Governments of the Empire, an Imperial Economic Committee constituted on the lines suggested at the Imperial Conference of the previous year would forthwith be appointed with the following terms of reference :—

To consider the possibility of improving the methods of preparing for market and marketing within the United Kingdom the food products of the overseas parts of the Empire with a view to increasing the consumption of such products in the United Kingdom in preference to imports from foreign countries and to promote the interests both of producers and consumers.

The particular products into the marketing of which the Committee would enquire would be determined by agreement among the Governments, and it had been decided that the first products to which it should devote its attention should be meat and fruit.

6. In the same debate Mr. Baldwin expressed the hope that through the investigations of the Imperial Economic Committee and through the provision of a fund (i.e., the fund which was later to become known as the Empire Marketing Fund) it might be possible "to open up entirely new and untried ways of developing trade within the Empire," which should be "of greater benefit to the Dominions" than the duties on a few specified food products which had been contemplated by His Majesty's Government in the United Kingdom in 1923.

As subsidiary to the main terms of reference the Imperial Economic Committee was asked to make recommendations regarding schemes which might usefully be financed from that fund (see paragraph 16).

7. The Imperial Conference of 1926 endorsed the work so far done by the Imperial Economic Committee and in continuing its work to the next Conference extended its operations in the following terms :—

“ The Imperial Conference is of opinion that the Imperial Economic Committee should continue on its present *ad hoc* basis with the following general reference :—

(1) to complete the series of investigations into the marketing of Empire foodstuffs in Great Britain, and while this work is proceeding ;

(2) to put forward for the consideration of the various Governments concerned (a) a list of raw materials for possible further marketing enquiries, and (b) suggestions for the preparation and circulation of brief preliminary surveys, as suggested by the General Economic Sub-Committee of the Conference, of any branch of Empire trade and marketing, such preliminary surveys, if the Governments concerned so desire, to be followed up by further enquiries.”

8. At the Imperial Conference of 1930 the terms of reference of the Imperial Economic Committee were further enlarged as follows :—

(1) To complete the series of investigations into the marketing of Empire foodstuffs in the United Kingdom.

(2) To undertake enquiries into the production for export and the marketing in various parts of the world of the raw materials enumerated in the Fifteenth Report of the Imperial Economic Committee.

(3) To prepare, at the instance of the Governments of the Commonwealth, preliminary surveys of any branch of Empire trade and marketing such as were contemplated in the recommendation of the Imperial Conference of 1926.

(4) To carry out any investigations arising out of recommendations contained in Reports submitted by the General Economic Committee and adopted by the present Conference.

(5) To facilitate conferences among those engaged in particular industries in various parts of the Commonwealth.

(6) To examine and report on any economic question which the Governments of the Commonwealth may agree to refer to the Committee.

The investigations arising out of recommendations submitted by the General Economic Committee of that Conference (see item 4 above) were :—

(i) The arrangement on a common plan of existing information on the mineral resources of the Empire ;

(ii) An enquiry into the possibility of a common understanding with regard to the principles which should determine the distinction between Empire and non-Empire goods.

9. The development of these terms of reference was significant. There was first a suggestion to appoint an Imperial Economic Committee with wide general terms. This did not materialise. A little over a year later the Committee was formed but its work was restricted to enquiries into the marketing of Empire food products in the United Kingdom. At the succeeding Conference (1926) the scope of the Committee's work was extended to include not only industrial raw materials of the Empire, in addition to foodstuffs, but also surveys of Empire industries and trades. The next Conference (1930) specified the mineral resources of the Empire as a survey which might usefully be undertaken. In addition, it entrusted to the Committee an entirely new class of enquiry raising new issues fundamental to Empire trade, namely, an investigation of the best lines of approach first towards what is now generally known as Imperial Industrial Co-operation, secondly towards a common recognition throughout the Empire of the principles underlying the definition of Empire content in merchandise traded between the member States of the Commonwealth. It instructed the Committee to continue any investigation arising out of recommendations made by the General Economic Committee of that Conference. Finally, it brought within the terms of reference of the Committee any economic question which the Governments might agree to refer to it.

III. CONSTITUTION OF THE COMMITTEE

10. The Committee originally included four members for the United Kingdom. But His Majesty's Government in the United Kingdom in 1924, when suggesting the appointment of the Chairman, stated that in the circumstances they would only wish to nominate three members. In 1926, however, they proposed and the other Governments concerned agreed, that an additional member should be appointed by them as representative of agricultural interests in the United Kingdom. In the same year Southern Rhodesia was invited to appoint a member. As a result, the Committee was then composed as follows.

A Chairman appointed by agreement between the Governments of the Empire, and members nominated by the various Governments of the Empire on the following scale :

- 4 by the Government of the United Kingdom,
- 2 by the Government of each Dominion,
- 2 by the Secretary of State for India,
- 1 by the Government of Southern Rhodesia,
- 2 by the Secretary of State for the Colonies.

11. The Committee retained this constitution until the Imperial Conference of 1930, when the following resolutions were adopted :—

- (i) The Conference is of opinion that the Imperial Economic Committee should continue as at present established, but takes note of the desire of His Majesty's Government in the United

Kingdom that their representation should be on the same basis as that of other parts of the Commonwealth.

(ii) The Conference is further of opinion that the Chairman of the Imperial Economic Committee should be elected annually by the Committee from among its own Members, regard being had to the desirability of rotation.

12. The Right Honourable Sir Halford J. Mackinder was the first Chairman and retained that position until 31st March, 1931, when the changes directed by the Imperial Conference of 1930 were carried through. Sir Sydney J. Chapman, K.C.B., C.B.E. (one of the United Kingdom representatives), was the first elected Chairman, and was later re-elected to continue until the conclusion of the Ottawa Conference. On his appointment to the Import Duties Advisory Committee of the United Kingdom, in March, 1932, he resigned from the Imperial Economic Committee, and his successor, Sir Horace J. Wilson, K.C.B., C.B.E., was elected.

13. The present membership* is as follows :

Sir Horace J. Wilson, K.C.B., C.B.E. (Chairman)	}	United Kingdom
Sir Thomas Allen		
Mr. Harrison Watson		Canada
Mr. F. L. McDougall, C.M.G.	}	Australia
Mr. C. L. Baillieu, C.M.G. O.B.E.		
Sir Thomas Wilford, K.C.M.G., K.C., High Commissioner	}	New Zealand
Mr. R. S. Forsyth		
Mr. J. H. Dimond		South Africa
Mr. J. W. Dulanty, C.B., C.B.E., High Commissioner		Irish Free State
Mr. William C. Job		Newfoundland
Sir Bhupendra Nath Mitra, K.C.S.I., K.C.I.E., C.B.E., High Commissioner	}	India
Sir Padamji P. Ginwala		
The Hon. J. W. Downie, C.M.G., High Commissioner		Southern Rhodesia
Sir John E. Shuckburgh, K.C.M.G., C.B.	}	Colonies and Protectorates
Mr. J. H. Batty		
Sir David Chadwick, C.S.I., C.I.E.		(Secretary)

* A list of past members of the Committee is given on page 3.

IV. POSITION OF THE COMMITTEE AND ITS RELATIONSHIP WITH OTHER ORGANISATIONS

14. In the field of Imperial co-operation two organisations occupy a special position and possess a special status—the Imperial Shipping Committee and the Imperial Economic Committee. Both are Imperial in constitution and standing. The Shipping Committee (which is the older creation) deals with questions referred to it affecting shipping, ports, and air transport on the routes of maritime transport which it may survey. The Economic Committee operates in a wider field. The position of the Imperial Economic Committee may be summarized as follows :—

(i) The Committee derives its constitution and its terms of reference from decisions adopted at Imperial Conferences and not from the decisions of any one Government.

(ii) The composition of the Committee and the number of representatives of each part of the Empire are determined by agreement among the several Governments.

(iii) The several members of the Committee are each appointed by their respective Governments.

(iv) The Committee undertakes no enquiry without the prior consent of all the Governments.

(v) The Reports of the Committee are submitted to the Prime Ministers of the Governments of the Commonwealth and to the Secretaries of State for India and the Colonies.

(vi) The functions of the Committee are advisory.

15. The presence of an Imperial Economic Committee in being was incidentally of service when in 1928 a special meeting was summoned in London to consider the establishment, recommended at the Imperial Agricultural Conference of 1927, of a number of bureaux on an Imperial basis, to collect, collate and disseminate information of a scientific and technical character on certain branches of agricultural science. The Secretary of State for Dominion Affairs who convened the meeting, particularly desired to emphasize its Imperial character, and with that object requested the Chairman of the Imperial Economic Committee to allow the Secretary of his Committee to act as Secretary of this special meeting. The Chairman agreed. At this meeting a new type of Empire organisation was evolved which the Governments of the Empire accepted. The Council administering the newly-formed Bureau requested that the Secretary of the Imperial Economic Committee should be permitted to act also as Secretary to the Council. This explains how it has come about that the Secretary of the Imperial Economic Committee is also Secretary of the Executive Council of the Imperial Agricultural Bureaux.

16. The relations between the Imperial Economic Committee and the Empire Marketing Board are particularly close. As an addition to its first terms of reference the Imperial Economic Committee was requested to advise on the uses to which the new fund (then estimated at £1,000,000 a year) which it was proposed should be voted by Parliament in the United Kingdom "for opening up entirely new and untried ways of developing trade with the Empire," should be put. As the money to be spent was the money of the United Kingdom taxpayer, and could therefore be spent only under the authority of some Minister responsible to the United Kingdom Parliament, the Committee advised that the fund should be administered by an Executive Commission responsible to that Parliament, but expressed the hope that means would be "devised whereby the views of the oversea Governments of the Empire, may, from time to time, be brought to bear in an advisory way on the problems involved." The fund should be used as a persistent driving force behind the policy of voluntary preference, in each of its three aspects—education of the consumer, co-ordination of research to improve the quality of Empire produce, and, in particular cases, the development of an economic intelligence service.

17. These ideas were developed in subsequent reports of the Imperial Economic Committee, especially in the first three, which were issued by the end of March, 1926. The Committee stated that by effective education and publicity, and by the establishment of clear marks of origin, this latent preference for Empire produce, which the Committee believed to exist, could be turned into regular custom. But the publicity required would have to be of a peculiar type. It would have to be on a high plane and nation-wide, and not identified with the products of any particular trader. In these early Reports the Committee singled out special problems for co-ordinated scientific investigation, such as those connected with the transport of meat and fruit, and recommended financial assistance to particular research stations, as for instance the Low Temperature Research Station at Cambridge. Among the specific recommendations on the economic side, as distinct from research, were those for the establishment of a fruit intelligence service and for financial assistance in the transport of pedigree stock.

18. As a result of these reports His Majesty's Government in the United Kingdom established the Empire Marketing Board, an official, non-political body, to advise upon the administration of the fund voted by Parliament. It was to be composed of Ministers holding certain offices and of members nominated by the Secretary of State in consultation with the Chairman of the Imperial Economic Committee. For the sake of efficiency the membership was limited but no part of the Empire was to be left unrepresented. All the oversea members on the Board and two of those from the United Kingdom are or have been members of the Imperial Economic Committee. This close connection between the two

bodies has greatly facilitated the difficult task of carrying out in practice those proposals and recommendations, contained in reports issued by the Imperial Economic Committee, which come within the purview of the Board's Vote. At the same time the Board has been perfectly free to seize any opportunity for Empire service within its competence. Close liaison between the two bodies has thus been secured, whilst flexibility for each in its own sphere has been preserved. None the less, the two bodies are distinct and differ functionally and constitutionally.

The Imperial Economic Committee is an Imperial body in the sense that it owes its authority to resolutions adopted at Imperial Conferences; that it is constituted of members appointed by the several Governments of the Empire; and that it reports to the Governments of the Empire on the several subjects referred to it by them.

The Empire Marketing Board is a body advising one of His Majesty's Ministers in the United Kingdom—namely the Secretary of State for Dominion Affairs—in the administration of an annual vote granted by the Parliament of the United Kingdom, and appointments to the Board, other than those of certain Ministers, are made by him in consultation with the Chairman of the Imperial Economic Committee.

V. FINANCE

19. The cost of the Committee has hitherto been met from the Revenues of the United Kingdom. For the first two years it was borne on the estimates of the Board of Trade, but from 1927 the expenses have been a charge on the Empire Marketing Fund. In the seven years of its existence from March, 1925, to March, 1932, the total net cost of the Committee, including salaries of staff, office accommodation, expenses of witnesses, and the printing and distribution of reports has been £20,250.

VI. WORK OF THE COMMITTEE

20. In all its enquiries the Committee has had the advantage of consultation with experienced officials of the Governments of the Empire, both in the United Kingdom and overseas, and is much indebted to them for the assistance so given. It has received evidence from prominent leaders in the industries and trades concerned, and from men of scientific eminence. It is the established practice of the Committee not to publish the evidence given, or the names of witnesses, and although this precludes any but a collective acknowledgment of their assistance in the published reports, the freedom thereby afforded to the witnesses to speak without reserve has been generally appreciated.

21. Much of the work is now done in sub-committees. Further, the direction of the Imperial Conference of 1930 to carry out investigations arising out of recommendations contained in reports submitted by the General Economic Committee and adopted by the Conference of 1930, led to a new procedure being evolved, to meet a special case. Among the investigations so remitted was "the compilation along the lines of a common plan of existing information on the mineral resources of the countries in the British Commonwealth of Nations." A further instruction laid down "that a central committee, on which such Governments as so desire, the Imperial Institute and mining and metallurgical institutions of the Commonwealth would be represented"—should be appointed to devise "that common plan" and "to correlate the information collected." In this case the Imperial Economic Committee, after consultation with the Governments and Institute mentioned, appointed a Minerals Committee to which this work has been entrusted.

22. Since its inception in March, 1925, the Imperial Economic Committee has presented 25 reports of which 21 have been completed in the last five years. They may be classified as follows:—

ON PARTICULAR PRODUCTS

Meat (1925)	Hides and Skins (1930)
Fruit (1926)	Tea (1931)
Dairy Produce (1926)	Coffee (1931)
Fish (1927)	The Wheat Situation, 1931—A
Poultry and Eggs (1927)	Survey (1931)
Honey (1927)	Cocoa (1932)
Tobacco (1928)	Wine (1932)
Timber (1928)	Hemp Fibres (1932)
Pigs and Pig Products (1929)	

ON TRADE AND INDUSTRY

- A Memorandum on the Trade of the British Empire, 1913 and 1925-1928 (1929)
- A Survey of the Trade in Agricultural Machinery (1928)
- A Survey of the Trade in Rubber Manufactured Goods (1929)
- Imperial Industrial Co-operation (1932)
- The Definition of Empire Goods (1932)

GENERAL

- General Report on Marketing and Preparing for Market of Food-stuffs Produced in the Oversea Parts of the Empire (1925)
- Functions and Work of the Imperial Economic Committee (1927)
- A List of Raw Materials suitable for Marketing Enquiries (1930)
- Progress Report : 1930

23. The majority of the reports deal with particular products, as it was to these that the attention of the Committee was first directed. Each of these reports presents a picture of the competitive position of an Empire industry *vis-à-vis* its foreign rivals, especially in Empire markets and notably in that in the United Kingdom. The Imperial Economic Conference of 1923 had, in the course of debate, made it clear that the Committee should not enter into questions of tariffs and no recommendations affecting rates of duties have been made, although the effects of tariffs in particular cases have been noted. Outside this fiscal field the recommendations have touched on questions of economic policy, as for instance generally on the question of a State-directed publicity campaign to encourage the purchase of Empire products, or (as an instance of particular cases) the adoption of official standards for the grading of produce for export. Other recommendations have been adopted and translated into practical effect by the Empire Marketing Board. Others, again, have been addressed to producers to improve the technique of their production and the organisation of their selling.

24. The reports are printed and published as soon as consent to publication has been received from the Empire Governments. On the publication of each report a wide free distribution has been made, with the assistance of the Empire Marketing Board, not only to official departments but also to producers and traders interested in particular reports, and especially to those resident overseas. Each report was concerned with a particular but widely scattered public, and the Committee believed that it would best assist Empire trade by endeavouring to ensure that these Reports reached as many as possible of those interested, even if this involved sending copies free. This policy has been justified by the publicity which the reports have received. Of the eighteen reports of the Committee which were on sale on March 31st, 1932, 110,000 copies had been distributed free, and the number of copies which had been sold, in addition to this generous distribution, exceeded 34,000. Some reports, such as the Progress Report, 1930, or that on Hides and Skins, have had small sales. Others, especially those on tea, dairy produce and pig products have sold much more freely. It appears from the returns of the Stationery Office that sales usually spread over four years.

VII. CONCLUSION

25. In the scope of its activities and in the procedure followed, a constant evolution has taken place. From being confined to the consideration of the marketing of Empire foodstuffs within the United Kingdom, the duties of the Committee have been extended to embrace subjects affecting particular trades and industries, and to complete work on which, for lack of information, no further

progress could be made during the sitting of an Imperial Conference. In the case, for instance, of "Empire content" of goods qualifying for preference, the Committee has presented for consideration at the Ottawa Conference a report setting out principles, the adoption of which would, it is believed, promote Empire trade. In the matter of procedure, from taking all enquiries in detail before the full Committee, it has adopted a system of working through sub-committees which permits the simultaneous prosecution of several enquiries and at the same time ensures to the Committee full cognizance of each subject. Since 1930 there has been a further development. Under the direction of an Imperial Conference it has nominated a committee representative of the Governments of the Empire and expert associations to assist in a particular enquiry. This increased flexibility in the Committee's procedure has enabled it to conduct economic enquiries of a diverse character remitted by successive Imperial Conferences.

H. J. WILSON (Chairman)	}	United Kingdom
THOMAS ALLEN		
HARRISON WATSON		Canada
F. L. MCDUGALL	}	Australia
C. L. BAILLIEU		
T. M. WILFORD	}	New Zealand
R. S. FORSYTH		
J. H. DIMOND		South Africa
J. W. DULANTY		Irish Free State
WILLIAM C. JOB		Newfoundland
B. N. MITRA	}	India
P. P. GINWALA		
J. W. DOWNIE		Southern Rhodesia
J. E SHUCKBURGH	}	Colonies and Protectorates
J. H. BATTY		
		D. T. CHADWICK (Secretary)
		LIONEL BRADGATE (Assistant)

June, 1932