



REPORTS OF THE IMPERIAL ECONOMIC COMMITTEE

TENTH REPORT.

TIMBER.

*Presented by the Secretary of State for Dominion Affairs
to Parliament by Command of His Majesty
August, 1928*

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Note.—The expenses of the Committee in connection with the preparation of this Report amount to £450. In addition, the cost of printing and publishing the Report is £101.

REPORT
ON THE
**METHODS OF PREPARING FOR MARKET AND
MARKETING WITHIN THE UNITED KINGDOM
OF RAW MATERIALS PRODUCED WITHIN
THE EMPIRE.**

TENTH REPORT.—TIMBER.

- TO THE RIGHT HONOURABLE STANLEY BALDWIN,
Prime Minister and First Lord of the Treasury.
- TO THE RIGHT HONOURABLE W. L. MACKENZIE KING,
C.M.G.,
Prime Minister of the Dominion of Canada.
- TO THE RIGHT HONOURABLE S. M. BRUCE, M.C.,
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- TO THE HONOURABLE W. S. MONROE,
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Premier of Southern Rhodesia.
- TO THE RIGHT HONOURABLE THE EARL OF BIRKENHEAD,
Secretary of State for India.
- TO THE RIGHT HONOURABLE L. C. M. S. AMERY,
Secretary of State for Dominion Affairs and for the
Colonies.

TIMBER REPORT.

TABLE OF CONTENTS.

	PAGE
I. Introduction.	
1. Witnesses	7
2. Sir George Courthope and Sir Peter Clutterbuck...	7
3. Authority for Report	7
4. Scope of Report	8
5. Division of timber into 'Softwoods' and 'Hardwoods'	8
II. Forest Resources.	
6. British Empire Forestry Conference of 1928	8
7. Adequacy of the supply of softwoods and hardwoods ...	9
8. Need for more detailed information... ..	9
III. Imports into the United Kingdom.	
9. Total Value... ..	9
10. Imports of timber, manufactured wood and wood-pulp...	9
11. Proportion of 'home-grown' to imported supplies ...	10
12-13. Total United Kingdom demand	11
14. Fall in prices between 1924 and 1927	11
15. Empire share of imports... ..	12
IV. Past efforts to encourage the use of Empire timbers.	
16. Merchant firms	12
17. Empire Forestry Association	12
18. Imperial Institute... ..	12
19. Recommendations of the British Empire Forestry Conference, 1920	13
20. Imperial Forestry Institute, Oxford	13
21. Forest Products Research Laboratory, Princes Risborough	13
22. Organisation of the Laboratory at Princes Risborough ...	14
V. Trade organisation in Imported Timber.	
23. Exporter and Agent	14
24. Importer and Merchant	15
25. When a timber may be considered established in trade ...	15
26. Trade organisations	15
27. Two main divisions of the trade	16
VI. Softwoods.	
28. Sources of imports... ..	16
29. From Northern Europe	16
30. From Newfoundland	16
31. From Eastern Provinces of Canada	17
32. From Western Provinces of Canada	17
33. Characteristics of Douglas Fir... ..	17
34. Method of production on the Pacific Coast	18
35. Sizes usually produced on the Pacific Coast	18
36. Need for careful preparation	19
37. Creosoting of Douglas Fir	19
38. Pencil cedar of East Africa	19
VII. Lighter Hardwoods.	
39-40. Possibilities of substituting lighter hardwoods for softwoods	19
41. Advisability of greater use of lighter hardwoods in countries of growth	20

	PAGE
VIII. Hardwoods.	
42. Sources of imports... ..	20
43. Oak	20
44. Mahogany	21
45. Teak	21
46. Walnut	21
47. Other kinds... ..	22
48. From Canada	22
49. From Australia	22
50. From South Africa and New Zealand	23
51. From India and Burma	23
52. From the Andamans	23
53. From British West Africa	24
54. From British West Indies	24
55. From Ceylon and British North Borneo	24
56. Vast wealth of Empire hardwoods	25
IX. 'Home-grown' Timber.	
57. Depletion of resources during the War	25
58. Extent of woodland areas	25
59. Rate of re-planting	26
60. Consumption	26
61. Haphazard felling	26
62. Advantage of intensive utilisation	27
63. Opportunity for co-operation	27
X. Trade in 'Home-grown' Timber.	
64. Nature of the trade	27
65. Uses	28
66. Oak, beech and elm for wood paving	28
67. Pitwood and pitprops	28
68. Problems of the trade	29
XI. Conditions for increasing the use of 'home-grown' and other Empire timbers.	
69. Conditions for successful competition... ..	29
70. Special features peculiar to timber	29
XII. Continuity of Effort.	
71. Sporadic attempts useless	29
72. Concentration of effort	29
XIII. Regularity of Supply.	
73.	30
74. Preliminary surveys	30
XIV. Determination of Uses.	
75. Need for investigating technical qualities	30
76. Local experience a partial guide	31
XV. Preliminary Examination.	
77-78. By experienced wood technologists	31
XVI. Large Scale Tests.	
79. Forest products research laboratories in the Empire	32
80. Their assistance to export trade	32
81. Adoption of standards by British Engineering Standards Association	32
82-83. Need for tests in the United Kingdom	32
84. Tests by Imperial Institute	33

	PAGE
XVII. Forest Products Research Laboratory at Princes Risborough.	
85. At present organised on a national basis	33
86. Extension of activities recommended for Empire purposes	34
87. Utilisation officer	34
88. Need for judgment in utilising the laboratory for large scale tests	34
89. Machinery for settling priority	34
90. Less need for limiting demands on services of wood technologist	35
XVIII. Quality and Grading.	
91. Need for careful grading	35
92. Grading before export	35
93. Application of recognised standards	35
XIX. Nomenclature.	
94. Disadvantages of present looseness of description	36
95. Names should be clear and authoritative	36
XX. Marking.	
96.	37
XXI. Stocks.	
97.	37
XXII. Financial considerations during introductory period.	
98. Ensuring stocks	37
99. Prices	38
100. Replacements	38
101. Advantages of reducing introductory period	38
XXIII. Special Representatives.	
102.	39
XXIV. Propaganda.	
103. Effective propaganda necessary	39
104. Need for precise information	40
105. Exhibitions	40
106. Importance of instances of timber in use	40
107. Circulation of lists giving such instances	41
XXV. Voluntary Preference.	
108.	41
109. Action by public bodies and companies doubly valuable...	41
110. Action by Office of Works	42
111. Opportunity for public bodies and companies	42
XXVI. Summary of Conclusions and Recommendations.	
112.	42
Appendix I. Imports of unmanufactured wood and timber into the United Kingdom, 1927	46
Appendix II. Imports of hardwoods into the United Kingdom, 1926	48
Appendix III. List giving a few instances of the use of Empire timbers in works and buildings in Great Britain	50

REPORT.

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 tenth report—the preparing for market and marketing of Timber.

I.—INTRODUCTION.

1. We have examined a number of witnesses representing producing, marketing and manufacturing interests; we have further had the advantage of consultation with experienced officials both of the United Kingdom and overseas Governments, and with men of scientific eminence. We thank all those who have appeared before us for their skilled assistance.

Witnesses.

2. Under our new Standing Orders we have adopted a procedure whereby a certain portion of the detailed inquiry is conducted before a Sub-Committee of our number to whom may be added, if considered desirable, as members of the Sub-Committee and not merely as witnesses, persons not members of the Imperial Economic Committee but possessed of expert knowledge of the subject under inquiry. In this case we have to thank Sir George L. Courthope, Bart., M.C., M.P., a member of the Forestry Commission of Great Britain, and Sir Peter Clutterbuck, C.I.E., C.B.E., formerly Inspector General of Forests, India, and now Chairman of the Empire Forestry Association for acting in this capacity.

Sir George
Courthope
and Sir
Peter
Clutterbuck.

3. The Imperial Conference of 1926 directed the Imperial Economic Committee to prepare for the consideration of Governments a list of raw materials suitable for inquiry on the lines of the Committee's reports dealing with foodstuffs. In 1927, the Governments of the Empire agreed that we should prepare such a report on timber.

Authority
for Report.

During the discussions at that Imperial Conference, the Prime Minister of Canada had cited Forest products as a subject in the marketing of which Canada was especially interested.

The quinquennial meeting of the British Empire Forestry Conference is to be held in Australia in the autumn of the present year. That Conference will be attended by delegates from the forestry departments of all Governments of the Empire. The latest information available on the forest resources of different parts of the Empire and, indeed, of the world will be reviewed.

The measures being taken for the re-forestation, conservation, management, and exploitation of the Empire's forests will also be considered. This was an additional reason for the preparation of a report at the present time on the marketing of Empire timbers in the United Kingdom.

Scope of Report.

4. We have excluded from our inquiry the wide range of articles frequently described as "minor forest produce," including grasses, canes, gums and tanning materials. We have only referred to the imports into the United Kingdom of manufactured wood, of wood pulp and of cellulose for the purpose of indicating the total demand made by the United Kingdom on the sources of wood supplies. We took some evidence on the import trade in manufactured wood, but found that this raised very large issues, an examination of which would have prevented the production of this report in time for the forthcoming Forestry Conference. We therefore deemed it advisable to confine this report to the raw material—timber. The timber trade is a very important one and the Empire resources are extensive and varied.

Division of timber into "Softwoods" and "Hardwoods."

5. By the range of its uses, timber falls into two main divisions, known as the "softwoods" and "hardwoods." The line between the two, neither commercially nor botanically, is a rigid one, but the distinction is sufficiently definite to be of direct practical importance.

Soft woods are chiefly used in ordinary building construction, for pit props, for general utility purposes and in the manufacture of wood pulp. Hardwoods find their main uses in portions of buildings subjected to hard usage, such as flooring, and for general purposes for which their qualities of hardness and durability render them peculiarly suitable, whilst, in many cases on account of their beauty, they are valued in the furniture trades and for decorative work such as panelling.

The soft woods of commerce are mainly derived from coniferous trees and the hardwoods from broadleaved trees.

II.—FOREST RESOURCES.

British Empire Forestry Conference of 1928.

6. As a result of the British Empire Forestry Conference held in Canada in 1923, Forest Authorities in Empire countries have been requested to prepare in a common form for the Conference of 1928, estimates of the total forest resources of their countries and to distinguish the areas containing merchantable timber.* Thus it is anticipated that in the autumn of the current year

* By merchantable forest is meant forest which is exploitable under current conditions or conditions which are likely to obtain within a reasonable period of time (say 10 years).

information on the timber resources of the Empire will be forthcoming more complete than any at present available. In view of this fact we do not propose to deal in this report with the statistics of forest resources nor with their relation to the demand for commercial timbers.

7. It is sufficient to state that Forestry authorities all the world over regard the world supplies of softwoods with anxiety. We must, however, record the fact that in the course of our inquiry we have not found this feeling of apprehension shared generally by the members of the timber trade in the United Kingdom. Adequate supplies have always been readily available in the past and it is possible that the trade has been lulled into a feeling of security for the future which the world position may not warrant. The commercial point of view is that a scarcity of supplies will adjust itself by an increase of prices which will bring within an economic radius fresh forest areas hitherto untouched.

Adequacy of the supply of softwoods and hardwoods.

8. The outlook is more fully realised by those concerned with organized forest management and conservation. Although the examination of forest resources is not within the purview of this report, we cannot too strongly urge the necessity for systematic investigation of the rate at which the softwood resources of the world are being depleted. If the interest of the timber trade and of the general public is to be enlisted for the conservation and development of the Empire forest resources and the lesser known varieties of Empire grown timber are to secure wider utilization, statements regarding the world and Empire position must be supported by statistics based on precise knowledge and not on information of a general character.

Need for more detailed information.

It may be found that it is necessary to make arrangements for the systematic collection and revision of statistics of world and Empire consumption in relation to supplies. We do not doubt that this important and, indeed, vital question will be fully considered at the forthcoming British Empire Forestry Conference.

III.—IMPORTS INTO THE UNITED KINGDOM.

9. The imports into the United Kingdom in 1927 of timber, manufactured wood and wood pulp were valued at £67 millions. Importation of timber alone came to £50 millions, of which some 90 per cent. was derived from foreign sources. Among the many raw materials imported into the United Kingdom, this high figure was only surpassed by imports of wool and cotton.

Total value.

10. According to the Trade returns of the United Kingdom the values of the imports into the United Kingdom of timber, manu-

Imports of timber, manufactured wood and wood pulp.

factured wood and wood pulp in the years 1924, 1925, 1926 and 1927 were as follows :—

Value, in thousands of £.

—	1924.	1925.	1926.	1927.
<i>Unmanufactured Wood and Timber.</i>				
Softwoods	38,601	34,172	29,410	38,985
Miscellaneous (soft and hard)...	3,521	3,270	1,903	1,930
Hardwoods	8,948	9,054	7,946	8,756
Total value of imports ...	51,070	46,496	39,259	49,671
Total value of re-exports...	703	708	681	741
Total value retained in United Kingdom.	50,367	45,788	38,578	48,930
<i>Manufactured Wood and Timber.</i>				
Total value of imports ...	5,371	6,226	6,799	7,314
Total value of re exports...	475	513	543	561
Total value retained in United Kingdom.	4,896	5,713	6,256	6,753
<i>Pulp of Wood.</i>				
Total value of imports ...	9,766	9,310	10,173	11,000
Total value of re-exports...	45	48	22	37
Total value retained in United Kingdom.	9,721	9,262	10,151	10,963

Thus the total values of the imports of these classes of wood into the United Kingdom were :—

	£
1924	64,984,000
1925	60,763,000
1926	54,985,000
1927	66,646,000

It will be seen that the disorganisation of industry in 1926 directly affected the import trade in that year, but that the imports of wood pulp continued to grow, owing no doubt to the fact that the demand for newsprint and artificial silk was unaffected. If industry generally now revives the total annual value of the imports of wood and wood products into the United Kingdom should in the near future amount to £70 millions.

Proportion of "home-grown" to imported supplies.

11. It is more difficult to form an estimate of the quantity of locally grown timber which goes into use in Great Britain. At the request of the Board of Trade the Forestry Commission in 1924 carried through a careful census of the production of "Home grown" timber in that year. The total value felled

in Great Britain was £2,036,000. This is very small compared with the value of the imports, but the comparison is misleading, since the home figures refer only to the value of the timber felled, whereas the import figures include large amounts of sawn or converted timber and even some manufactured wood. A fairer indication of the extent to which locally grown timber enters the market is furnished by the following table in which both the "home grown" and the imports (excluding manufactured wood) are expressed in the terms of "standing timber."

Figures in millions of cubic feet.

—	Conifers.	Hardwood.	Total.
Net imports in 1924 of timber and wood pulp (in terms of standing timber).	906.4	74.7	981.1
"Home" production in 1924 of woods of all descriptions.	30.9	25.1	56.0
Total	937.3	99.8	1,037.1
Percentage of locally grown timber to total.	3.3	25.2	5.4

12. Consumption has probably increased somewhat since 1924. Local supplies have for the time probably declined owing to the severe cutting which took place during the war years. On this assumption it may be taken that Great Britain and Northern Ireland now consume annually about 1,100 million cubic feet of standing timber, of which approximately 90 per cent. are conifers or softwoods and under 10 per cent. are hardwoods. "Home grown" timber constitutes 3 per cent. of the supply of softwoods and about one quarter of the supply of hardwoods.

Total United Kingdom demand.

13. It is convenient at this point to postpone the further treatment of the problems connected with "home grown" timber until we have described the import trade.

14. It will have been noticed that the value of the unmanufactured wood and timber imported in 1927 nearly equalled that of 1924. The quantity, however, as distinguished from value was much greater in 1927 than in 1924. The average declared value per load* of sawn soft wood dropped from £5 6s. 10½d. in 1924 to £4 17s. 3¾d. in 1925, £4 11s. 6d. in 1926 and £4 13s. 9d. in 1927.† The fall in declared values between 1924 and 1927 is thus 12.2 per cent. In the same period, prices of iron and steel fell by 16.1 per cent. Particulars of the values and quantities of imports for the year 1927 are given in Appendix I.

Fall in prices between 1924-1927.

* A load=50 cubic feet.

† The average declared value rose in the first six months of 1928 to £4 16s. 5½d.

Empire
share of
imports.

15. The value of the various classes of timber imported from Empire and foreign sources for the year 1926* is as follows :—

Thousands of £.

	Empire sources.	Foreign sources.	Total.
Softwoods	1,722	27,688	29,410
Miscellaneous (soft and hard) ...	68	1,836	1,904
Hardwoods	2,276	5,669	7,945
Total	4,066	35,193	39,259

Thus, 94 per cent. of the imports of softwoods and 96 per cent. of those classed as miscellaneous which are mostly softwoods, were drawn from foreign countries. The Empire, however, supplied 30 per cent. of the imports of hardwoods. If teak be eliminated from the statistics in regard to hardwoods the position is even less satisfactory, for nearly one-half of the imports of hardwoods from Empire sources consists of teak, of which the Empire through India possesses practically a monopoly.

IV.—PAST EFFORTS TO ENCOURAGE THE USE OF EMPIRE TIMBERS.

Merchant
firms.

16. The encouragement of a wider use of Empire timbers, especially of those only little known, demands organised and continuous effort. Such success as has so far been attained is very largely due to the initiative of a comparatively few merchant firms. Two public organisations are at present interested in extending the use of Empire timbers in the United Kingdom, namely, the Empire Forestry Association and the Imperial Institute.

Empire
Forestry
Association.

17. The Empire Forestry Association is of recent origin. It was incorporated by Royal Charter on 1st November, 1921. It is a voluntary Association supported by those interested in forestry in all parts of the Empire and thus forms a valuable means for the interchange of information and experience. Amongst its objects is the fostering of public interest in the merits of Empire-grown timbers suitable for commercial purposes.

Imperial
Institute.

18. One of the functions of the Imperial Institute is to promote the use of Empire products, and in pursuance of this general purpose an Advisory Committee on Timbers was formed and has been in existence since 1916. This Committee is

* The latest year for which particulars of countries of origin of all classes of imported timber are available.

engaged in a survey of the lesser known Empire timbers and in bringing to the notice of the trade those species which it recommends for industrial use. Within the somewhat narrow limits of the equipment available, the testing of Empire-grown timbers, with a view to the determination of their physical and mechanical properties and their working qualities, is also undertaken at the Imperial Institute.

19. At the meeting in London of the British Empire Forestry Conference in 1920 recommendations were made to the various Governments of the Empire for the conduct of research both into the growth of forests and into the utilization of timber. So far as Great Britain was concerned, the recommendations included on the one hand the establishment of a research institute to deal with the problems of growth, and on the other hand a research organisation, which should include a central institute, to investigate the utilization of timber and of forest products.

Recommendations of the British Empire Forestry Conference, 1920.

20. In pursuance of these recommendations, the Imperial Forestry Institute was established at Oxford in 1924, in close connexion with the University, for the higher training of Forestry Officers, the provision of special and "refresher" courses for Officers already serving, and the conduct of research into forest production.

Imperial Forestry Institute, Oxford.

21. Investigation into the utilization of timber and of forest products was entrusted to the Department of Scientific and Industrial Research, which in 1925 established a fully-equipped Forest Products Research Laboratory at Princes Risborough in Buckinghamshire. The work of this laboratory covers the whole range of forest products research, as may be seen from the following list of the sections of the Laboratory organisation and their main purposes.

Forest Products Research Laboratory, Princes Risborough.

Group I.

i. Wood Technology :—

(a) Correct identification.

(b) Anatomical structure for rough classification of uses.

ii. Seasoning :—

(a) Basic principles.

(b) Practical application.

Group II.

i. Timber Mechanics :—

(a) Comparative strength of timbers.

(b) Tests on structural sizes to determine influence of defects.

(c) Special tests for specific uses.

- ii. Wood Preservation :—
 - (a) Durability; in natural state and after antiseptic treatment.
 - (b) Toxicity of antiseptics.
- iii. Wood Working :—
 - Sawing, machining and finishing tests.

Group III.

- i. Pathology :—
 - (a) Decay caused by fungi.
 - (b) Attacks by insects.
- ii. Chemistry of Wood :—
 - (a) Wood analysis.
 - (b) Derivatives of wood.
 - (c) Chemical changes due to seasoning, or attack by fungi and insects.

Group IV.

Utilisation :—

- (a) Liaison with industry.
- (b) Industrial investigations to confirm uses and to suggest markets.

Organisation
of the
Laboratory
at Princes
Risborough.

22. The Laboratory at Princes Risborough is organised on a national and not at present on an Empire basis. Its main purpose is to promote, in the national interest, the more economical use of timber by the timber-using industries of the United Kingdom. For this purpose, the origin of the timber is a subordinate consideration, for to the timber user it is as important to avoid waste of foreign-grown timber as of Empire-grown timber.

The services of Princes Risborough are primarily for the assistance of the timber-using industries in the United Kingdom, but investigations of a wider character are also conducted on behalf of the Forestry Commission and of other timber growers in the United Kingdom.

V.—TRADE ORGANIZATION IN IMPORTED TIMBER.

Exporter
and agent.

23. On its way from the forest to the point of consumption in the United Kingdom, timber passes through certain well recognised trade channels. The exporter or shipper in the country of origin sells through his accredited agent in the United Kingdom to the timber importer, who, in his turn, disposes of his stock to the timber-using industries and to the smaller timber merchants. Most of the timber produced in European countries is exported by sawmill owners who are themselves shippers; but in some parts of Europe and in certain other countries, timber extraction is in the hands of comparatively small firms,

and in such cases the shipper acts as collector, purchasing supplies and grading and sorting them into suitable parcels for the export trade.

Even large users of timber rarely buy in the country of production. Practically all imported timber passes through the hands of the shipper's agents who sell to importers in various parts of Great Britain and, who being in close touch with the local markets, are in a position to advise the shippers of the sizes and qualities in special demand at the various centres of consumption. With his knowledge of both parties to the trade—shippers and importers—the agent is in a position to make advances to the shipper and also at times to finance the importer by giving him credit.

24. When the timber reaches the importer it has reached the point of primary sale in the United Kingdom. The importer generally purchases the timber outright. He it is who usually carries the large stocks both to serve big consumers who may not themselves buy through agents and to supply the requirements of timber merchants.

Importer
and
merchant

One witness has given us the following graphic description of his experience of the distribution of timber after purchase by the importer.

“ A stock appeals to an importer as being cheap: the time appeals to him as being opportune; he thereupon decides to purchase the consignment, without, perhaps, having yet sold any part of it. He then sets about disposing of what he has purchased. One parcel or size may be sold to a builder, another to a toy maker, a third to a packing case maker, a fourth will go to the manufacture of cable drums, a fifth to a broomhandle manufacturer, and so on. He also sells a large proportion to the timber merchant.”

“ The last link in the organisation for the distribution of timber is the small timber merchant, who has obtained his supplies from the importer. In every town, in every district in the great cities, one finds the timber yards. Here is stacked where everyone can see it, quantities of timber in various sizes. The man who wishes to put up a chicken-run goes to the small local timber merchant and buys from him. The small builder who has an urgent job patronizes him and firms who use small quantities of timber for repairs and other odd work are his customers because he can deal with their requirements quickly and can give them mixed loads of various sizes.”

25. A new timber can only be deemed to be properly established in the trade when importers and merchants accept the risks associated with the carrying of stocks in the manner just described.

When a
timber may
be considered
established
in the trade.

26. The timber trade is divided into many sections according to the general character of the timber or of the use to which

Trade
organisations.

it is put. The importers and merchants dealing in the different classes are organised in the chief timber trading centres into trade associations—such as the Hardwood, Softwood, Home-Grown Timber, Pitwood, Plywood and Sleepers Associations—all of which are amalgamated in the Timber Trades Federation of the United Kingdom. Timber agents and brokers have their own separate organisation which is, however, affiliated to the Federation. Manufacturers such as sawmill proprietors, furniture manufacturers, builders' merchants and carriage and automobile manufacturers also have Associations. These organisations deal with matters of current trade interest and practice.

Two main divisions of the trade.

27. We propose now to consider the import trade of the United Kingdom in its main divisions—the softwoods and the hardwoods—in order to determine for each class the nature of the demand and the character of the competition which suppliers from the Empire must face in the United Kingdom market.

VI.—SOFTWOODS.

Sources of imports.

28. In paragraph 15 it was shown that of the imports of softwoods, representing in value a trade exceeding £31 millions in 1926, roughly 95 per cent. were drawn from foreign sources. Eighty per cent. of these imports were supplied from Northern Europe—Russia, Finland, Latvia, Sweden, Norway and Poland. The United States sent over 6 per cent. and the whole of the Oversea Empire contributed less than 6 per cent.

From Northern Europe.

29. Exporters of softwoods from Northern Europe find their most important market in the United Kingdom. They have accordingly made a close study of its conditions and requirements. Timber arrives graded and sawn to the sizes the markets demand; and marked in a manner which enables buyers to purchase their supplies on specification without previous inspection.

From Newfoundland.

30. The only countries in the Empire which now possess large supplies of coniferous trees within easy reach of a seaboard are Newfoundland and Canada. Except for the export of a small quantity of pitprops, Newfoundland has no share in the timber trade to the United Kingdom. In fact, Newfoundland has for the present practically ceased to be an exporter of timber to any market, either in America or in Europe. Her coniferous forests are now being used for the manufacture of paper. Already paper has gained second place in her export trade and promises soon to displace from its premier position the trade in cod fish. According to the Newfoundland trade returns the total exports of paper in the year 1st July, 1925, to 30th June, 1926, amounted to 106,000 tons valued at £1½ millions. Of this quantity 68 per cent. was sent to the United Kingdom and the balance, except for a small shipment to New Zealand, to the United States.

31. Canada must therefore be looked to for any large increase in the supplies of Empire softwoods to the United Kingdom market. Her forests lie in both the Eastern and Western Provinces. The trade with the United Kingdom in the products from the forests of Eastern Canada is of long standing. Those forests, however, consist chiefly of Spruce which is being increasingly used for the paper and pulp trade. The amount exported as timber has been declining for some years. Spruce is a useful wood for general construction purposes, but the high prices paid by pulp manufacturers are a deterrent to its extensive use in the United Kingdom, though a little of the better quality still comes into the country. Similarly White Pine from Canada has to some extent gone out of use in the United Kingdom on account of its increasing price, caused largely by the depletion of the forests in the neighbourhood of the rivers, the natural highways from the lumber camps to the ports. There are, however, supplies of Red Pine and Jack Pine which are widely used locally in place of these woods. Eastern Canada exports timber to a large and ready market in the thickly populated and highly industrialised areas in the Eastern portions of the United States and therefore has less to send to the United Kingdom.

From
Eastern
Provinces of
Canada.

32. The opening of the Panama Canal has brought the resources of the Western Canadian forests more readily within reach of the United Kingdom. British Columbia, with her vast forests of fine softwoods, is the chief lumber producing Province of Canada.

From
Western
Provinces of
Canada.

The chief varieties are Sitka Spruce, Western Hemlock and Douglas Fir. Sitka Spruce possesses strength combined with lightness, qualities which render it peculiarly suitable for aeroplane construction. Western Hemlock is useful for joinery purposes and interior construction work. The most important timber in British Columbia is, however, the Douglas Fir—known also as Oregon Pine—which grows along the Pacific Coast on both sides of the international boundary. This timber occupies a prominent place amongst the soft woods of commerce; in fact, it is reputed to supply a larger share of the world requirements of timber than any other single species.

The Douglas Fir is one of the most magnificent trees in the world. It sometimes attains a height of 300 feet with a diameter at the base of from 8 to 10 feet, though the average tree is from 80 to 100 feet high and 2 to 4 feet in diameter.

33. The size of the Douglas Fir, with its uniform growth and freedom from boughs to a considerable height from the base, enables timber of large sectional dimensions and of considerable length to be cut clear of knots, sapwood and other natural defects. Baulks 100 feet and over in length and 2 feet square in section can be obtained and this makes the wood peculiarly valuable for structural purposes where timber of large dimensions is required.

Character-
istics of
Douglas fir

Owing to its durability and its resistance to decay it is useful for such purposes as railway sleepers, for piles and bridge building and for general building and construction work. The wood possesses a well-marked grain which renders it attractive for joinery and internal work. It is, in fact, a wood of wide general utility, for which an extensive market in the United Kingdom should be assured.

Method of
production
on the
Pacific coast.

34. The method of production of timber on the Pacific Coast differs in material respects from the method in European countries, in that in the latter the saw millers guided by experience of past demands cut each log to the best advantage, whereas on the Pacific Coast the chief consideration in timber conversion is speed of output. Owing to the vast wealth of timber which up to the present has always been available in British Columbia, economy in cutting has not been practised and we are informed that enormous quantities of material are cut to waste and destroyed. The result of this high rate of output, which is dependent on large saws working at high speed, is a tendency to irregular cutting which militates against the acceptance of the wood in the United Kingdom for use in better class work. The grading rules in operation on the Pacific Coast permit a certain variation in the dimensions of the sawn timber, but United Kingdom consumers are accustomed to the exact dimensions which result from the more careful cutting in the European mills and are not disposed to accept variations from their specifications. In cutting for the United Kingdom market, therefore, the timber should be of uniform size from end to end and should be cut "plump" that is, its size should be such as to allow a margin for shrinkage, so that after seasoning the dimensions are not less than those required by the specification.

Sizes usually
produced
on the
Pacific coast.

35. The saw mills of British Columbia produce primarily for the North American market and many of the usual sizes to which timber is sawn are not those in common use in the United Kingdom. It has been suggested that by arrangement, architects and engineers might be prepared to adapt their specifications to enable the usual Canadian sizes to be utilized. If progress is to be made in this direction information regarding stock sizes should be readily available. In the case where certain sizes are indispensable, these would require to be specially cut by the Canadian mills for the United Kingdom market. Though this might increase the cost of production, it might be well worth while if a larger market were thereby created.

The mechanical and physical properties of Douglas Fir have been the subject of careful investigations carried out at the Forest Products Research Laboratories of Canada and the published results might be used for the preparation of tables for use in Great Britain showing the strengths of the various dimensions of Douglas Fir in comparison with those of other softwood constructional timbers there in use. Before changing his specification of dimensions an architect or engineer would require to be

assured that he is using material of equal strength to that with which he is familiar.

36. The timbers with which Douglas Fir is in competition are not only sawn to the requirements of the United Kingdom market, but are also carefully sorted, graded and finished. They thus present a good appearance. Timber, like other commodities, is to some extent sold on appearance and the acceptance of Douglas Fir by users would be encouraged by greater care in preparation. Need for careful preparation.

37. Doubts have been entertained in the United Kingdom regarding the possibility of creosoting Douglas Fir satisfactorily for use on the ground, as, for instance, as sleepers. These doubts, however, appear to have arisen from applying to Douglas Fir the standard treatment applicable to Baltic softwoods. Douglas Fir is very widely used for sleepers in America and has also been used for the same purpose in South Africa and India. Most of the sleepers used by the Egyptian and Sudan railways are of Douglas Fir. Thus *prima facie* grounds exist for believing that this timber should be suitable for use as sleepers in the United Kingdom. The Southern Railway Company in England have now made arrangements to test Douglas Fir sleepers creosoted in Canada with a view to determining whether the objections which have been taken to the use of Douglas Fir for this purpose arise from unsuitable treatment. These trials, combined with periodical examinations which will be made over a period of five years by the Forest Products Research Laboratory at Princes Risborough, should go far towards ascertaining the proper manner of creosoting Douglas Fir for use in the United Kingdom. Creosoting of Douglas fir.

38. Certain softwoods possess particular properties rendering them suitable for particular purposes. An interesting example of this is Pencil Cedar, of which the United States is at present the chief source of supply to the world. That source is now being severely taxed to meet the world demand. The Empire, however, possesses in East Africa a timber of the same genus—the African pencil cedar—which in colour, odour and whittling properties is similar to the pencil cedar of the United States. It grows abundantly throughout the higher regions of Kenya and is also found in certain parts of Uganda and Tanganyika. Pencil cedar of East Africa.

VII.—LIGHTER HARDWOODS.

39. Thus we are in the presence of two new facts in regard to softwoods; on the one hand the growing demand in the great market of the United States and, on the other hand, the availability in the United Kingdom, via the Panama Canal, of timbers from British Columbia whose properties are well known but with which consumers in the United Kingdom are not yet fully familiar. There is, however, yet another source from which timber may be drawn to serve some of the purposes for which Possibilities of substituting lighter hardwoods for softwoods.

softwoods are now used ; certain kinds of hardwoods possess some of the qualities of softwoods.

40. The line of distinction between softwoods and the lighter hardwoods is not a rigid one. The uses to which softwoods are now put in the United Kingdom are varied and it is probable that for many of them, lighter hardwoods of Empire growth—light both in weight and colour—may be found to be suitable. Investigations which are being carried out in India already show that certain of these lighter hardwoods can be seasoned to be similar in colour and working properties to the recognised softwoods. It is also believed that several of the little known woods of Nigeria possess similar properties. This is a problem worth careful examination, for if these lighter hardwoods can be used in place of softwoods and supplied at competitive rates a large market in the United Kingdom will have been opened for many species of Empire woods at present unmarketed.

Advisability of greater use of lighter hardwoods in countries of growth.

41. Although the supply of overseas markets of the Empire is not within the scope of this report we feel it apposite to call attention to the fact that many parts of the Empire, which at present import softwoods, have in their own forests many species of these lighter hardwoods. We have been informed that in Malaya and elsewhere special attention is being directed to the wider utilization of locally grown timbers in place of imported softwoods. The pressure on the main sources of supply of softwoods would obviously be relieved by such a policy and to the extent to which local resources were developed the Empire as a whole would be less dependent on foreign countries. We trust therefore that the Forestry Departments in the parts of the Empire into which softwoods are imported will pursue their search for local woods capable of replacing them.

VIII.—HARDWOODS.

Sources of imports.

42. Hardwoods are imported into the United Kingdom in great variety and from many countries. The imports of hardwoods for 1926 showing the countries of export are given in Appendix II.

Oak.

43. The hardwoods in commonest use are Oak, Mahogany, Teak and Walnut. Of these Oak is imported in the largest quantities and has the widest range of uses. It may, in fact, be described as the general utility wood amongst the hardwood classes of timber. It is used in place of softwoods in much high-class constructional work ; its qualities of durability and resilience render it peculiarly suitable where strength and resistance to hard usage are required ; whilst for decorative purposes, oak holds a sentimental place in public esteem which no other wood enjoys. Oak to the value of over two million pounds is imported into the United Kingdom every year of which less than 1 per cent. is supplied from within the Empire. It is

not generally realized that three-quarters of the oak imported into the United Kingdom is grown in the United States.

44. A still more remarkable fact is that three-quarters of the **Mahogany.** imports of sawn mahogany into the United Kingdom in 1926 came from the United States where the tree does not grow.

The chief sources of supply are Central America—British Honduras and Nicaragua—and West Africa—both British and French. The British West African Mahogany is exported to the United Kingdom mostly in the form of logs; the British Honduras mahogany reaches the United Kingdom mostly as timber sawn and converted in the United States. It has been suggested to us that sawmills should be established in British Honduras.

The supply of mahogany from Cuba is small but has a special value. It is the true Spanish mahogany of which the supplies in the world are now very short. This tree also grows in Jamaica and it appears to us that a valuable contribution might be made to the Empire resources of hardwoods if measures were taken to encourage the growth of this species of mahogany in that island. We have been informed that this question is receiving the attention of the Authorities in Jamaica.

45. Teak, of which over one million pounds worth is imported **Teak.** into the United Kingdom each year, is obtained entirely from the countries of the East. India, particularly Burma, is the most important source of supply. Siam is at present a competitor, but we are informed that on account of overcutting in the past, supplies from that country are likely to be restricted. It is evident therefore that the Empire enjoys something approaching a monopoly in the supply of this valuable wood.

In Burma there are two orders of forest, the reserved and the unclassed. The general tendency during the past twenty or thirty years has been to work the unclassed forests without restriction with the result that production from these areas is becoming exhausted. In the reserved forests extraction is controlled by working plans and the output of teak is at present restricted to 300,000 tons a year. Future supplies are thus ensured, though any large increase in production within the next thirty years is not to be expected. There is a wide and steady market for teak in India, where it is especially esteemed on account of its immunity from the attacks of the white ant, and only some 10 per cent. of the output is shipped for use in other countries.

The limitation of the supply of teak makes an opportunity for other varieties of timbers drawn from within the Empire. Thus Douglas Fir from Canada and Kauri Pine from Australia are being tried for decks of ships, whilst Pyinkado from Burma and Greenheart from British Guiana have proved successful for under-water work such as piling and bridge construction.

46. The imports of walnut into the United Kingdom are less **Walnut.** than those of oak, mahogany, or teak, but are nevertheless considerable. They are derived chiefly from the United States

and from France. Out of a total importation into the United Kingdom of walnut valued at £300,000 Canada contributed in 1926 some £36,000. A small quantity of "African walnut" in the log is received from Nigeria. Walnut is essentially a furniture and cabinet wood.

Other kinds.

47. In addition to supplies of oak, mahogany, teak and walnut, other hardwood are imported every year into the United Kingdom to the average value of £3,000,000 of which some 70 per cent. comes from foreign sources. Though the Empire share in this trade is as yet small the quantity and variety of the woods growing in its forests are vast. Their extent is not yet fully known. We propose to mention a few examples from various parts of the Empire of timbers which might for some purposes, at any rate, be substituted for imported foreign hardwoods such as oak and walnut.

From Canada.

48. Although Canada produces mostly softwoods she possesses many varieties of hardwoods of commercial interest, notably maple, birch, white elm and basswood. All these timbers grow extensively in Eastern Canada and are largely employed in the local woodworking industries.

Maple is widely used for flooring and there is now a regular and increasing export trade in blocks and strips to the United Kingdom for this purpose. Birch, on account of its colour and lustre, is extensively used in cabinet and furniture manufacturing and also serves in Canada for flooring. White elm grows well in Canada and provides a timber suited for general purposes where qualities of toughness and durability are required. Basswood is easily worked but of no great mechanical strength.

From Australia.

49. Australia produces many varieties of hardwoods of commercial value, the most abundant of which are of the Eucalyptus family—broad-leaved evergreens which yield timbers of great durability suitable for engineering works and for all purposes of general building construction. Although the Australian engineer, builder, cabinet maker and wheelwright can exercise a wide choice in the use of native timbers, the species of which quantities can be made available to establish a substantial export trade are more limited. The most important timbers for export are the jarrah and karri of Western Australia, of which jarrah is well-known in the United Kingdom and is used for a variety of purposes, such as flooring and sleepers. It has been computed that the value of jarrah and karri exported from Australia since the first consignment left for England in 1844 amounts to £22 millions.

Several species of the Eucalyptus yield lighter and more easily wrought timbers and the most important of these from an export point of view is "Tasmanian oak," which grows principally in Tasmania and Victoria. This has been on the United Kingdom market for some years, and its value as a substitute for foreign oak and American pitch-pine is now receiving fuller recognition.

Amongst hardwoods available for export, other than those of the Eucalyptus family, mention should be made of the Tasmanian myrtle and "Queensland walnut," Black bean and Silky oak of Queensland. Myrtle, "Queensland walnut" and Black bean are handsome decorative woods which should compete with French and American walnut in furniture and cabinet work. Silky oak is an ornamental wood for which may suitable uses, such as parquet flooring, may be found.

50. The available supplies of timber in South Africa are not large and the Dominion itself offers in most cases a sufficient local market. Two varieties, however, of hardwoods, Kamassi and Cape Box, are exported; these are of fine texture and are used for such purposes as shuttles for weaving looms, tool handles and mathematical instruments. From South Africa and New Zealand.

In New Zealand a wide variety both of softwoods and hardwoods is found. There has, however, been extensive cutting of the forests in the past and a policy of conservation and re-forestation has become necessary in recent years. A certain amount of timber, however, is exported annually to Australia, but the trade with the United Kingdom is small.

51. A wealth of hardwoods exists in many of the countries of the Empire within the tropics. Foremost amongst these is India. From India and Burma.

Hardwoods are found in all parts of India, though for export purposes the most important areas are Burma, the Andamans, and the Western Ghats. The chief difficulty in extracting these timbers from Burma and the West Coast is their inaccessibility and the lack of transport facilities. The forests consist of many kinds of trees in intimate mixture; it has been recorded that in teak forests no less than 64 species of forest trees are found in common association with teak. The Government of Burma has drawn up a list of timbers of economic value, amongst which probably the most promising is Pyinkado. This timber is practically a newcomer in the United Kingdom, but a wide market is anticipated as its exceptional properties of durability become known. It is extremely hard and heavy, is claimed to resist the attack of teredo, and is described as highly suitable for piers, wharves and underwater work generally. Amongst other Burma timbers regarded as suitable for marketing in the United Kingdom are Eng, Gurjun, Thitka, and Padauk, all of which are of good qualities and attractive in colouring.

52. The Andamans are a chain of small mountainous islands situated in the Bay of Bengal and surrounded by coral reefs. They are clothed down to the water's edge with dense tropical vegetation. The natives have never possessed axes or wood-hewing implements, so that the forests have remained unchanged by man and may be classed among the virgin forests of the From the Andamans.

world. There is no teak on the islands, but there are many other species of an economic value, chief amongst which are Padauk, Gurjun, Koko, Silver greywood and white mahogany. The timber is readily accessible, since no parts of the islands are more than about ten miles from the coast. Logs are dragged to the sea and rafted to the mills for conversion. The timber is marketed chiefly in India, but an increasing quantity is now being sent to the United Kingdom. We are informed that no private firms have in the past been granted concessions on the islands and that the timber is worked by the Forest Department of the Government of India.

From
British West
Africa.

53. British West Africa is well situated geographically to supply the timber market of the United Kingdom. The output of Nigeria and the Gold Coast is at present limited to Mahogany, with a comparatively small quantity of Ebony and "Ashanti cedar." These Colonies produce many other varieties of timber, which in contradistinction to mahogany are classed as "secondary" to that important source of revenue and trade. Some of these, such as Iroko and Sida, should have considerable economic value. We understand that the Colonial forestry departments are devoting attention to the study of the possibilities of these "secondary" timbers for local purposes and are preparing to ascertain the possibilities of their development for an export trade. From the evidence which we have received, it appears that the trade in mahogany would be assisted if the economic value of some of these other timbers could be proved. West Africa mahogany, like the teak in Burma, does not grow in dense stands but scattered throughout forest areas, mingled with other species. An increase in the number of trees profitably extracted from a given area should obviously decrease the general overhead costs on mahogany.

From
British West
Indies.

54. Many timbers of possible importance in trade are found in the British West Indian Islands and the mainland Colonies of British Guiana and British Honduras. The mahogany of British Honduras and Jamaica has already been mentioned. Amongst timbers of proven value the "luxury" woods, such as ebony and lignum vitae, of Jamaica and the Bahamas may be mentioned. There are immense resources of timber in British Guiana, the development of which is retarded by difficulties of transport. Greenheart has been exported to the United Kingdom for many years for use in a number of directions, of which the two extremes are piles for marine construction and the most flexible sections of fishing rods. Mora is another variety of hardwood, found in British Guiana and Trinidad, which is becoming known in the markets of the United Kingdom as a useful timber for constructional purposes where strength and durability are required.

From Ceylon
and British
North
Borneo.

55. Valuable timbers are imported into the United Kingdom from Ceylon and British North Borneo. The chief export from

Ceylon is satinwood, which is a fine decorative wood, specially suitable for veneers. From British North Borneo there is a fairly large trade in red and white cedar (seraya) and camphor wood. Camphorwood resembles teak and is used for such purposes as coachbuilding.

56. These instances merely illustrate the great wealth of hard-wood timbers in the Empire. Some of those mentioned like mahogany and teak and, to a less degree, jarrah and karri from Australia, maple from Canada and greenheart from British Guiana are already established in the timber trade and well known to the British public. Others such as "Tasmanian oak" and padauk are known to some extent; others are just appearing and behind them is a wide range as yet only known to the forester.

Vast wealth
of Empire
hardwoods.

IX.—" HOME-GROWN " TIMBER.

57. The forest resources of the United Kingdom have for long been inadequate to meet the needs of the country. During the War, the imperative demand for economy of freight space forced the State to turn to the woodlands of Great Britain with a heavy and destructive hand. At the outbreak of war there existed, fortunately, a comparatively large proportion of mature timber, both conifers and oak. Precise information is not available but it has been estimated that some 450,000 acres, mainly of softwoods, were "clear-felled" during or immediately after the War, yielding approximately 1,000 million cubic feet of timber. This represented about one-third of the timber resources of Great Britain. Naturally the best and most readily accessible timber was taken.

Depletion
of resources
during the
war.

With a view to remedying the situation resulting from this depletion of timber resources, the Forestry Commission of Great Britain was constituted in 1919.

58. A census of woodlands taken in 1924 by the Forestry Commission shows a total area of woodland in Great Britain of 3,000,000 acres, equivalent to 5.3 per cent. of the total land area of the country. Of this woodland area, about one half is described as being reasonably productive; of the rest approximately 800,000 acres of felled wood and scrub are, from the forestry point of view, idle land; 500,000 acres of coppice and coppice with standards have a very low average productivity; finally 200,000 acres of amenity and similar woodlands are definitely uneconomical in the sense that they are outside the scope of commercial forestry.

Extent of
woodland
areas.

The following table* provides an estimate of the contents of the woodlands of Great Britain in 1924.

Saw Timber sizes—

				Millions of cubic feet. (quarter girth measurement.)	
Coniferous	...	...	...	748	
Hardwood	...	...	...	798	
					1,546
Pitwood sizes—					
Coniferous	...	...	...	374	
Hardwood	...	...	...	342	
					716
Total	...	...	...		2,262

This estimate excludes branchwood; further, no account has been taken of hedgerow timber or of the contents of woodlands classified as uneconomical (amenity woods, etc.).

Rate of re-planting.

59. It is estimated by the Forestry Commission that private planting will not at best do more than keep pace with current fellings, and we are advised that under existing conditions it is probable that fellings exceed plantings. The current planting programme of the Forestry Commission is approximately 23,000 acres per annum, mainly conifers. Private owners and Corporations are planting about 12,000 acres per annum additionally.

Under its present programme, 90 per cent. of the planting undertaken by the Forestry Commission is of softwoods. This is a matter of expediency. The timber cut during the War was mainly coniferous and as this is the class required in greater bulk for commercial purposes, the primary effort of the Commission is to replace it as quickly as possible.

Consumption.

60. The Forestry Commission estimate that 56,000,000 cubic feet were felled in 1924. The Commission state that probably 30,000,000 cubic feet of that total were consumed in the districts in which they were produced or else disposed of in the round as pitwood to the coal mines; the remainder, about 25,000,000 cubic feet, went into town mills and was distributed as converted timber.

Haphazard felling.

61. There are few large areas of forest land in Great Britain. The timber grows for the most part in small woods and plantations scattered over the countryside. Many of the owners of these woodlands have not in the past pursued a policy with a view to deriving a recurrent profit from their timber. Timber has often been felled in a haphazard fashion—a tree here and

* Taken from the "Report on Census of Woodlands and Census of Production of Home-grown Timber, 1924," issued by the Forestry Commission, 1928.

there, marked by the owner for removal on account of its age or for some other reason unconnected with its commercial value. Not being a regular contributor to the timber market, the owner has lacked the inducement to keep himself acquainted with prices or to study the means of deriving the best value from his timber.

62. The marketing activities of the Forestry Commission of Great Britain are at present relatively small. They sold about £70,000 worth of timber in the year 1926-27. None the less, their selling arrangements illustrate the commercial possibilities of the woodlands of Great Britain. We have been informed that in cases where the Commissioners have undertaken the preparation of timber for market and its subsequent sale they have succeeded in disposing of every portion felled and have realised greater profit than by selling the standing timber according to a practice prevalent in the British countryside. The case of the Tintern woods has been cited to us. There the timber and thinnings were divided into some 30 or 40 categories, ranging from oak timbers for furniture manufacture to bean and pea sticks, and each category obtained its separate market. This affords a valuable illustration of the extent to which efficient organization renders possible the intensive utilization of forest produce.

Advantage
of intensive
utilization.

63. The methods of the Forestry Commission can, to some extent, be applied on the larger and better timbered estates. Many large owners have already placed the management of their woodlands on a commercial footing by installing their own sawmills and carrying out the conversion of the timber on their estates. One witness has informed us that for over 100 years the wood sales on his estate had not met the cost of maintenance and taxation on the woodlands. After installation of a sawmill, the values realised had covered such costs as well as depreciation on the plant and had left a profit. The woodlands on many properties are too small to justify the erection of sawmills, but it has been suggested to us that by means of portable sawbenches, provided through co-operative action, owners should be able to secure the profits arising from careful conversion. We understand that associations have been formed in England and in Scotland with the object of developing such action among woodland owners, not only in the sale and disposal of timber but also in planting and woodland management.

Opportunity
for
co-operation.

X.—TRADE IN "HOME-GROWN" TIMBER.

64. The scattered and uncertain nature of the sources from which the "home-grown" timber markets draw their supplies has reacted upon the character of the trade. It is mostly in the hands of small merchants, trading independently and each dealing in timber derived from a comparatively small area in his

Nature of
the trade

own neighbourhood. There are no organised markets for "home-grown" timber. Various disadvantages arise from this want of organisation. Overhead charges are frequently high in proportion to the amount of trade done. The accumulation and maintenance of stock sufficient to justify close grading and sorting are often a matter of difficulty. On the one side large consumers complain that they cannot obtain supplies of "home-grown" timber readily, and on the other the saw-mill owner is unable to quote for many of the larger contracts. Thus timber the intrinsic qualities of which would justify its use for high-grade work is disposed of locally for general purposes. At the same time the saw-mill owner is in competition with a well organised foreign trade, wherever he sells in the larger towns and, indeed, often in his own area. It thus follows that the price he offers for standing trees is often low and insufficient to encourage the proprietor to replant. There appears to be scope for greater organisation with a view to winning back part of the market now held by foreign supplies.

Uses.

65. A committee, consisting of representatives of the Land Agents' Society, the Federated Home Grown Timber Merchants' Association, the Royal Institute of British Architects and the Department of Scientific and Industrial Research, has recently tabulated the purposes for which "home-grown" timber is suited. The results of their investigations have just been published*. The enquiry covers some thirty varieties of timber. Their range of uses, which run into several hundreds, forms in itself an interesting commentary on the essential part which timber takes in the manufacturing industries of the country. This publication sets out the various uses both fully and authoritatively. We only refer to two special uses of timber for which there is normally a large demand at present chiefly supplied from foreign sources.

Oak, beech
and elm
for wood
paving.

66. English oak and English beech are used to a certain extent for wood paving. The use of English elm for this purpose, is we think worthy of attention. Early trials of English elm undertaken in London were inconclusive. The Forest Products Research Laboratory at Princes Risborough has, however, recently carried out a series of tests which demonstrate its suitability for road paving. A greater use of English oak, beech and elm by Highways Authorities should be of advantage to the "home-grown" timber trade.

Pitwood
and pit
props.

67. In 1927 pitwood and pit props were imported into the United Kingdom to the value of nearly £5½ millions. As compared with this total the "home-grown" pitwood and pit props are of small value, none the less in Scotland and in the North of England, where comparatively large stands of conifers are

* "The uses of Home-grown Timbers" published by the Department of Scientific and Industrial Research (Forest Products Research), Price 1s. net.

found, the trade has a relative importance. The estates of the Forestry Commission are also now beginning to produce pitwood and pit props and their output is steadily increasing.

68. No question arises in connection with "home-grown" timber of introducing new varieties to the United Kingdom market. The problems chiefly centre round an increase in supply and an improvement in marketing organisation. Increase of supply is being directly encouraged by the Forestry Commission; improvement of marketing organisation is only gradually attracting attention. Different as these two problems may appear in detail from those confronting other Empire countries, yet the aim is the same—to secure a greater share of the United Kingdom market for Empire produce.

Problems of the trade.

XI.—CONDITIONS FOR INCREASING THE USE OF "HOME-GROWN" AND OTHER EMPIRE TIMBERS.

69. Both "home-grown" and Overseas Empire timbers have to compete with well organised supplies from foreign sources. The conditions of successful competition are the same as in the case of other commodities. There must be a supply, regular and sufficient in quantity, suitable in quality, competitive in price, backed by adequate propaganda. None the less there are special features which condition competition in the timber trade due to the characteristics of forestry and to the purposes to which timber is put.

Conditions for successful competition.

70. On the one hand felled timber cannot rapidly be replaced. On the other hand many of the uses to which timber is put are of a permanent nature and the suitability of a timber for a particular purpose can often be judged only after a series of years. In introducing any new product or in extending the use of a known article to a new purpose there is always the opposition to be met from vested interests and there is also the inertia of custom. In the case of timber, this inertia is reinforced by a natural doubt as to the behaviour of a given wood over a long period of time.

Special features peculiar to timber.

XII.—CONTINUITY OF EFFORT.

71. To meet these conditions systematic work is necessary. Injudicious attempts to establish a trade in a timber of which no large supplies are available, or of which the supply may fail after introduction, are liable to prejudice the general movement towards the greater use of Empire timber in the British market. Sporadic attempts to develop a trade in timber are peculiarly inept; the campaign must be planned with foresight and continued methodically and without interruption over many years.

Sporadic attempts useless.

72. The first objective is to press the sale of varieties of Empire timbers already partially known. It would be a

Concentration of effort.

mistake to crowd the market with a large number of new and untried kinds, for the public and the trade would only be confused, the expense of carrying stocks of many varieties in restricted demand would be prohibitive and the danger of recommending timbers for unsuitable purposes would be increased. New timbers should not, in our opinion, be placed upon the market without the most careful ascertainment of their properties, for mistakes in this regard cannot fail to prejudice subsequent attempts to introduce other new timbers from the same country.

XIII.—REGULARITY OF SUPPLY.

73. We propose, for convenience of presentation, to consider the questions of regularity of supply, quantity and quality from the point of view of the introduction of a new timber. The problems are obviously more clear cut in such a case, but they are involved only in slightly less degree in the development of the market for timbers already partially established.

Preliminary surveys.

74. The first consideration in the introduction of a new variety of timber to the United Kingdom market is regularity of supply. Regularity of supply depends primarily upon the quantities in which the growing timber exists in the country of origin and upon its accessibility. It must exist in commercial quantities, must be accessible both as regards extraction and transport, and an organisation must be in existence to ensure that regular supplies can be shipped from the country of origin and placed on the United Kingdom market at a cost which will enable it to compete with established timbers of similar qualities. The estimate of the quantities available and of the cost of extraction and transport must of necessity be conducted in the country of origin. For this purpose forest engineering surveys are required.

XIV.—DETERMINATION OF USES.

Need for investigating technical qualities.

75. When surveys have shown that a given kind of timber exists in merchantable quantities, the technical qualities of that timber should be investigated in order to determine its commercial uses. A general idea of the properties of a timber is rarely sufficient to justify its recommendation for a particular purpose. Oak from one country may be substituted for oak from another in the decorative trades with complete satisfaction, but it does not follow that the same two oaks are equally satisfactory for use for arms on telegraph poles, for which strength is the chief consideration. The increased use of fire-resisting materials in building has lessened the use of timber for joists and general construction purposes, with the result that selection of softwoods for such work turns now less on their strength than on other properties such as ease of working on the bench and of obtaining rapidly surfaces suitable for taking paint. Even with a competitive price, it is not sufficient to inform a purchaser

that a certain timber is a soft or hard wood roughly equivalent in quality to a known kind. He requires reassuring on practical points connected with the particular uses to which he desires to apply the wood in question.

76. In the Dominions local experience furnishes a good guide to the probable uses of commercial timbers in the United Kingdom. In tropical countries local experience is not so helpful. In both cases, information based on investigation in the country of sale and use is necessary. Science has now furnished means whereby much of that information can be obtained more quickly than from experience gained from the slow process of "trial and error"—and in the case of timber "trial and error" is indeed a slow process.

Local
experience
a partial
guide.

XV.—PRELIMINARY EXAMINATION.

77. The first step in the determination of the probable uses of a timber is the microscopic examination of its cellular structure by a trained wood technologist. This examination not only enables a correct identification of species, but may disclose such a structure and properties as to render improbable any important industrial use. Thus, expense and effort in endeavouring to market a new timber for which the market prospects are small may be avoided. On the other hand, such examination may reveal a similarity of structure to a timber of proved commercial value and thereby afford a preliminary indication of profitable uses. An instance has been cited to us from India where, by a microscopic examination of this nature, two varieties of timber out of a large number of species were found to be suitable substitutes for boxwood.

By experi-
enced wood
technolo-
gists.

78. The wood technologist can complete his examination on a range of small samples of wood. It is not necessary that he should work in the country in which the timber grows. It is necessary, however, that he should possess a wide experience of the structure of woods of many countries and of the general uses they serve, and that he should have readily available for reference a collection of specimens and the results of their examination. Examination by a wood technologist, though very helpful as a pointer to the probable uses of a timber, does not provide sufficient data to enable a wood to be definitely recommended for any particular use. Trials on much larger samples are needed to determine strengths and strains, suitable methods of seasoning and of treatment by antiseptics, and behaviour under tools. When such tests on the larger scale are carried out under standard conditions, under the control of experienced specialists, then a very clear idea of the purposes to which a given timber is suited and of the manner in which it should be handled may be obtained.

Notes.—Wood Technology connotes in forest products research laboratories, microscopical investigation into the structure and properties of timbers.

XVI.—LARGE SCALE TESTS.

Forest products research laboratories in the Empire.

79. Large scale trials are the special function of forest products research laboratories. These institutions are expensive to equip and maintain, but their value is being increasingly recognised throughout the Empire. There are now large and well-equipped laboratories at Dehra Dun in India, at Ottawa and Vancouver in the Dominion of Canada, and at Princes Risborough in England. A special Timber Investigation Branch is attached to the Forest Research Institute at Pretoria in South Africa, and both in Australia and New Zealand considerable research work into timbers has been conducted in co-operation with the Universities. We understand that the Council of Scientific and Industrial Research of the Commonwealth Government is carefully studying the question of establishing a forest products research laboratory in Australia and similar proposals are being considered by the Governments of New Zealand and the Federated Malay States.

Their assistance to export trade.

80. Apart from their obvious uses in regard to the greater local employment of all products from local forests, these laboratories in the Dominions and the Colonies can at the present stage assist the export trade by the conduct of tests on the green wood and the determination of the most satisfactory methods of seasoning sufficient to enable timber to stand the journey to Europe without deterioration, either from causes incidental to transport through the tropics or from attacks by insect or fungi.

Adoption of standards by British Engineering Standards Association.

81. It would appear that users of timber have not yet fully grasped the value of the results to be obtained from the recently established forest products research laboratories. The British Engineering Standards Association is promoting a wider utilization of these results by recognising certain methods of test as standard and by establishing standard forms in which such results may be presented.

Need for tests in the United Kingdom.

82. Pending the general adoption throughout the Empire of such standard tests and forms, it must be recognised that the trade in Great Britain will attach most weight to the results of research conducted in a laboratory at home with which they are familiar and with whose staff they can confer. Moreover, they thus obtain the advantage of the experience of a staff constantly in touch with the needs and methods of British users of woods, and the existence of a staff with such experience is of great value to overseas parts of the Empire in so far as it gives confidence to those who venture on newly introduced timbers.

83. Further, timber behaves differently under different climatic conditions. This is especially the case where it is brought from a tropical to a temperate climate. Even the transport of timber through the tropics may affect its properties and condition. The purchaser in the United Kingdom wishes to know how it will behave in his own country. He also requires to know the best and most economical methods of seasoning and conditioning the wood for his particular purpose. This knowledge can only be obtained by investigations undertaken in the United Kingdom.

84. The Imperial Institute have reported upon many Empire timbers. They have in the course of time brought together a large collection of samples. They have also organised timber exhibitions. They are widely known and receive enquiries regarding Empire woods. The experience of the individual members on their Advisory Committee should be of assistance in estimating the uses for which a timber is suitable. The Imperial Institute, however, deal with a wide range of raw materials, of which timber is only one. They possess neither the equipment nor the staff of a fully equipped forest products research laboratory. We appreciate the work they are capable of doing in the interest of Empire timbers, but in view of their location at South Kensington and lack of equipment, we do not think that they should be asked or expected to provide full data in regard to the employment of new Empire woods.

Tests by
Imperial
Institute.

XVII.—FOREST PRODUCTS RESEARCH LABORATORY AT PRINCES RISBOROUGH.

85. The Forest Products Research Laboratory at Princes Risborough has the equipment and staff trained for this class of work. It is, as we have explained, at present organised on a national basis to serve the needs of the United Kingdom only. It undertakes investigations at the request of the Forestry Commission into the uses of "home-grown" timbers. Apart from the occasional examination of Empire timbers at the request of commercial users in the United Kingdom, the laboratory at present undertakes investigations of an Empire character only on special occasions on payment of fees, and when such investigations can be fitted into its general programme. We think that an important service to the Empire might be rendered if satisfactory arrangements could be made for providing funds to enable the Laboratory at Princes Risborough to include the testing of Empire timbers as one of its normal functions.

At present
organised on
a national
basis.

Note.—In paragraph 87 above, mention was made of the co-operation of the Laboratory at Princes Risborough with the Southern Railway in regard to the creosoting of Douglas Fir for sleepers. In connection with another user, the Laboratory is investigating the means for obtaining a better finish on Douglas Fir when used for joinery purposes. This appears to turn largely on the manner in which tools are set.

Extension of activities recommended for Empire purposes.

86. We recommend that the Empire Marketing Board should investigate the possibility of securing an extension of the activities of the Laboratory at Princes Risborough for this purpose. Some additional capital expenditure on equipment would be required and also some recurrent expenditure on staff. But we do not contemplate any very large addition under either head, though this is a matter which will require examination in detail.

Utilization officer.

87. An interesting feature of the organisation at Princes Risborough is the presence on the staff of a special officer whose duty it is to be in constant touch with the timber market and with the users of wood and generally to act as a liaison officer between the scientific staff and the timber-using industries. He is described as a "timber utilisation" officer. An extension of the Forest products research laboratory to enable it to deal freely with Empire timbers would probably necessitate the appointment of a second timber utilisation officer. We should consider this appointment an important part of our proposals in regard to Princes Risborough. If it ever became necessary to appoint yet further utilisation officers to devote their whole time to the timbers either of a single Empire country or of groups of countries, we consider that the cost should be borne by the country or group of countries requiring that service.

Need for judgment in utilizing the laboratory for large scale tests.

88. These proposals for testing Empire woods will break down if indiscriminate demands are made on the services of the Laboratory. Such tests take time and demand much work and large samples. They should therefore be confined to woods which it is proposed to push in the market actively and methodically. We have already recommended that the Governments should concentrate their efforts on the more promising species, and it is in the belief that such a policy will be followed that we have recommended the extension of the activities of the Laboratory at Princes Risborough to deal with Empire timbers, the sale of which is to be pressed in the United Kingdom.

Machinery for settling priority.

89. If this is done some means will be required of deciding priority in regard to the services to be rendered by the Laboratory. Several considerations arise. Preference should clearly be given to those timbers which possess good commercial prospects; equally clearly the activities of the Laboratory should not be concentrated on the products of one or two portions of the Empire to the exclusion of those of other parts of the Empire. In estimating the commercial prospects of a timber, the chief points for consideration are its proved utility (or in the case of a new timber its *prima facie* value as indicated by examination by a wood technologist) its occurrence in merchantable quantity, its accessibility and the probability of regular supplies at competitive prices. We have still to consider the agency which should decide priority in accordance with these principles; we think that that duty might be entrusted to a Committee comprised of representatives of the Empire Marketing Board and

of all timber exporting parts of the Empire. At the present time it does not appear desirable to add to the number of "ad hoc" Government Committees, and we suggest that the Committee here proposed should be a sub-committee derived from some established recognised body, such as the Empire Marketing Board.

90. This question of priority only arises in regard to the major laboratory tests. It is not so important in regard to the preliminary work of the wood technologist. Many advantages, in fact, are likely to accrue from the examination of a large number of specimens of new woods whether or not they are subsequently developed commercially. Wide and useful knowledge of these timbers will thereby be obtained by the Empire countries overseas which do not possess their own wood technologists, whilst the material at the disposal of wood technology for purposes of comparison and record will be increased.

Less need for limiting demands on services of wood technologist.

XVIII.—QUALITY AND GRADING.

91. When all has been done to secure the fullest and most trustworthy knowledge of the capabilities of a new or unfamiliar timber, there still remains the problem of actually introducing it to the market. In our previous reports we have had again and again to reiterate the urgent need for close attention to quality and grading. Careful grading facilitates the actual processes of marketing and also gives confidence in the article sold. When confidence in standardized grades has been established, C.I.F. sales become possible and the difficulty and expense of carrying stocks is lessened. All this holds good in regard to timber and no less in the case of new kinds of wood than in that of well-known varieties; buyers are apt to be more critical of the behaviour of a new wood and less tolerant of possible defects than in the case of one of established reputation to which they are accustomed. This attitude may seem unjust, but it is very natural and needs to be taken into account.

Need for careful grading.

92. Where Empire timber is sawn and converted before export, there should always be careful grading. Some timbers are shipped in the log and such grading on export is not possible, but none the less care should be taken to send only logs which may be expected to yield a large percentage of high quality wood.

Grading before export.

93. A merchant with long experience of the timber trade has brought to our notice the system of grading in operation in the United States. There a scale of grades and faults for each kind of timber, according to the characteristic quality and defects of the wood, is accepted as a basis for sale in all but small local transactions. He has suggested that a similar system would be of general advantage if introduced into the United Kingdom. On that point we are not in a position to express an opinion, but we are convinced that any action which would remove some

Application of recognised standards.

of the looseness of description still prevalent in the timber market would be of general benefit and in the direct interest of exporters of Empire timbers.

XIX.—NOMENCLATURE.

Disadvantages of present looseness of description.

94. An extreme example of this looseness of description is furnished by the custom still prevalent of specifying in building contracts the use of "Dantzic pine," though none of that timber has been seen on the British market for some forty years. It is obvious that when terms are used which have lost meaning their effect is to permit the use of timber from any source of supply which approximates to the requisite quality. We hope that Empire woods will be specified in contracts to an increasing extent as their properties become better known and appreciated. With this object the importance of a clear and well-understood system of nomenclature for Empire timbers is apparent.

Names should be clear and authoritative.

95. The question of nomenclature is, however, not a simple one. For instance, Douglas Fir, which is the chief soft wood of the Empire, also grows abundantly in the north-western portions of the United States. It was first introduced into the United Kingdom as "Oregon pine," a name which served to distinguish it from the Pitch pine of the southern United States, and by the name of Oregon pine is still largely known in the British market. In the whole of North America—both the United States and Canada—it is known as Douglas Fir, and we presume that it was owing to some accident of origin of the samples first introduced into Great Britain that the geographical name Oregon became attached to it. To-day Oregon undoubtedly implies a United States origin and we therefore think that where it is desired that the timber used should be drawn from an Empire source the expression in the specification should be "Canadian Douglas Fir."

The choice of a trade name for a new timber requires care. It should be attractive, short and distinctive. The botanical description of the tree is rarely suited for trade purposes and the local name in the country of origin may at times be disadvantageous. Few, for instance, outside the country of origin, would appreciate that under the intimate but slightly contemptuous name of "stringy-bark" a wood of high value and great utility was being brought to their notice.

In some cases a local name such as "Padauk" may be adopted; in others a name associated with a wood of similar properties, as for instance "Tasmanian oak" or "African walnut"; and yet in others a name specially coined such as "Silver grey wood." In all cases, however, it is essential that new names be authoritatively introduced in order that they may be generally accepted. The difficulty of propaganda is increased if it is necessary to explain that the timber to which attention

is being drawn has several alternative trade names. A good timber deserves a good name, and should not have its identity obscured by aliases. We are glad to hear that the British Empire Forestry Conference are endeavouring to secure general acceptance of standard trade names for Empire timbers.

XX.—MARKING.

96. Clear nomenclature is the first step towards identification. It does not, however, obviate the substitution of foreign woods of the same or similar species in the execution of a contract. This may be prevented, unless actual fraud be resorted to, by marking the timber at the time of export or of preparation for primary sale in the United Kingdom. It is a common practice to place trade marks on the ends of logs and sawn timber. The advisability of adding a mark indicative of the Empire country of origin is worthy of careful consideration; such a mark would serve to remind both buyers and users of the availability of Empire timbers. It is, however, important that such national marks be associated not merely with the idea of origin but also with that of satisfactory quality.

XXI.—STOCKS.

97. The existence of stocks in the country of sale where the timber can be seen and drawn upon is a necessary feature of the timber trade. It ought to be possible to arrange special consignments against large orders, but for usual trade requirements stocks are needed. Contracts have to be completed to fixed dates and this does not admit of delay in obtaining supplies. A contractor may be induced to substitute foreign timber for Empire timber where the latter has been specified, not merely by reason of price but also because of ready supply. He frequently works under a penalty clause and may be willing to pay more for the foreign timber which is available than to wait for the Empire timber and risk a penalty for delay. When trade in a timber is well established the maintenance of stocks in the country of sale becomes a matter of course, but during the period of introduction of a new timber such stocks must involve special arrangements. Without stocks it is hopeless to expect to establish a regular trade. The necessity of special finance for maintaining stocks of a little known timber is an additional reason why an exporting country should concentrate on a few of its most promising varieties.

XXII.—FINANCIAL CONSIDERATIONS DURING INTRODUCTORY PERIOD.

98. The introduction of new timbers on to the market involves risk and expense which timber merchants hesitate to incur. Private enterprise has incurred that risk in the past, but the

Ensuring
stocks.

relatively small use of Empire timbers in the United Kingdom is a measure of the reluctance of the merchant to depart from tried and relatively safe courses. Associations of producers with or without Government aid (or in exceptional cases even Governments themselves) must be prepared to regard expenditure during the earlier periods of development as a capital outlay. We doubt the advisability, as a general rule, of Government Departments engaging in the trade and carrying the whole risk themselves. But without going to that extreme, assistance towards the maintenance of stocks during the introductory period might be provided by Governments in producing countries overseas, on the lines, for instance, of the Trade Facilities Act which was in force in the United Kingdom from 1921 to 1927.

Prices.

99. It is not only for the purpose of carrying stocks that special arrangements are necessary for the development of the market for a new timber. Prices must be carefully adjusted to the market rates of competing woods and producers must therefore be ready to regard an absence of profit in this stage as expenditure for development. The buyer is being invited to use a timber to which he has been attracted but to which he is unaccustomed and in regard to the behaviour of which he may entertain not unreasonable doubts. He must therefore be tempted in the matter of price. Fancy prices may at times be obtainable from some specialist who likes to have something rare and unique, but forest exploitation and development cannot rest on a sale of curiosities.

Replacements.

100. It is helpful to the introduction of a new timber or to the application of a timber to a new use, if some undertaking can be given to replace any pieces which may be found to be unsatisfactory. But in this regard there must be caution; guarantees unlimited in time are inadvisable. A timber may be subjected to usage for which it was not intended at the time it was put in, as for instance, by the constant movement of heavy trucks over a floor designed for light work. Faults may be attributed to a timber which are really due to defective building construction as when panelling is placed on a persistently damp wall. For these reasons, it is not customary in the timber trade to give extended guarantees. The last payment on a building contract is frequently deferred but when it has been paid and a clean completion certificate secured the transaction is regarded as closed. Once more, therefore, we come to the fact that exceptional measures may have to be resorted to during the development of a market and such measures involve a liability which must be cautiously incurred and provided for.

Advantages of reducing introductory period.

101. It will be seen that special financial arrangements for introducing new timbers may be involved under at least three heads, the carrying of stocks, the reduction of prices and guaranteeing of replacement. It is therefore clear that everything should be done, once a timber is selected for marketing, in order to reduce this period of development. We have been

informed that when left to the ordinary processes of trade, it took fifty-eight years for British Honduras mahogany to be recognised as equally suited as Cuban mahogany for furniture, although the woods are similar in appearance. By concentration and foresight and the adoption of suitable means, there is no question that in these days results may be achieved in a comparatively short time.

XXIII.—SPECIAL REPRESENTATIVES.

102. The Government of India have recently made an interesting endeavour to compass this end. They have appointed to London an officer of their Forest Department who has paid special attention to the commercial utilization of local woods in India. He does no trade in Indian timber. No consignments pass through his hands. But by keeping in touch with large users and important building operations he is able to influence the selection of Indian timbers for use in important contracts. He is thus succeeding in establishing the best form of propaganda for Indian timbers, namely—actual use. The supply is arranged through merchants and the ordinary trade channels. He is available to refer to, if any defects in the timber appear and is free, if he deems it advisable, to arrange for the substitution of any small portions which may turn out to be defective. If the Laboratory at Princes Risborough undertake the wider duties for the Empire which we have suggested, his knowledge of Indian timbers and of the trade fits him peculiarly for liaison with their staff and especially with their utilization officers. In view of the many aspects of the timber trade and of the many considerations involved in extending the market for timbers in the United Kingdom, other Governments might also consider the advisability of appointing to London similar representatives with special knowledge of the timbers of their own lands. Such agents would probably be attached to the London offices of the Governments.

XXIV.—PROPAGANDA.

103. Whatever arrangements be made for carrying the unavoidable risks in the earlier stages of introducing timbers there must be effective propaganda to stimulate interest. That propaganda must be supported by adequacy of supply, competitive prices and exact and confident knowledge of the suitability of the various timbers recommended; for great damage results if it is prematurely undertaken. Many different interests must be addressed; particular trades, like the furniture makers and plywood manufacturers must be approached; large users like public bodies, railway companies and dock authorities must be interested; architects and contractors must be persuaded. Behind all the general public should be educated to recognize Empire timbers. It is often difficult to say which of the parties interested has the final word; in some parts of a building the choice may be left to the contractor, but in other parts the

Effective
propaganda
necessary.

architect decides. Not infrequently the client expresses a decided preference for some timber in particular rooms. He may only know of such common timbers as oak, walnut and mahogany, and the architect may have an opportunity for substituting an Empire timber, when he can recommend it with knowledge and confidence. We therefore consider that special care should be taken to inform architects of the qualities of Empire timbers and above all of instances in which they have been used. We earnestly hope that architects generally will make it their interest to bring Empire timbers to the notice of their clients and utilise them wherever they can do so consistently with their clients' interests.

Need for
precise
information.

104. The points differ upon which users require to be assured. In some cases, the chief considerations will be ease of working, in others strength and durability, and in yet others appearance and the preservation of that appearance for many years. Therefore propaganda especially in trade and professional circles should not be of too general a character. It should deal with particular timbers and not omit the technical points involved in their utilization. For this reason, general advertising and Press articles, unless in the technical Press, will be useful only to a small extent. An example of the information which might be supplied is found in the brochure just published on "home grown" timbers, which we have already mentioned. Exhibitions organised in different parts of the United Kingdom are undoubtedly useful, but by far the most convincing propaganda alike for experts and for the general public is to be found in the inspection of important works, in which Empire timbers are in actual use.

Exhibitions.

105. Timber exhibitions should not merely display museum specimens. The utility and attraction of a timber Exhibition lies not in photographs and panels but in the display as far as possible of articles made from the timbers, articles in general use as well as decorative furniture. The Empire Timber Exhibition which was held in 1920 attracted much attention and stimulated general interest. Many regarded the timber exhibits at Wembley as among the most attractive displays at that Exhibition. The Imperial Institute have recently organised another timber exhibition in London. We consider that such exhibitions would serve a very useful purpose if they were also held at intervals in some of the other large towns of the country, especially as they become increasingly practical in their display and the information they supply.

Importance
of instances
of timber in
use.

106. But however well exhibitions may be organised the most potent propaganda, as we have already said, will be found in directing attention to the actual use of timber in accessible places. Actual use provides the answer to many doubts. We have appended to this report a list of a few works and buildings in which lesser known Empire timbers have been used (Appendix III). This is the kind of information to which we

think the widest publicity should be given and the representatives of different Empire countries interested in the development of their timber trade should make special efforts to keep such information up-to-date. It is important to bring home to the public that Empire timbers have been used in places much frequented and generally admired. For example, the furnishings of the "Royal Scot" express are of Indian Silver grey wood and the floor of the new building of Lloyds is of "Tasmanian oak."

107. However much different parts of the Empire may naturally be interested in the pushing of their own timbers it must not be forgotten that the user in the United Kingdom will desire the widest choice of Empire timbers for his consideration. We consider that lists should be compiled of important cases in which Empire timbers have been utilized in the United Kingdom and that the fact that such lists are obtainable should be advertised by the Empire Marketing Board, who would be prepared to distribute them to inquirers, referring the inquirer in any subsequent correspondence to the representatives of the countries concerned. From a practical point of view, it is important that such lists should relate to the timbers of the whole Empire and not be limited to those of any particular portions.

Circulation of lists giving such instances.

XXV.—VOLUNTARY PREFERENCE.

108. We have dealt in detail with the action which in our opinion exporting countries should take to make their timbers acceptable to the British user. But the active practical assistance of the purchaser is also needed. A detached attitude on his part is insufficient. We believe that the movement of voluntary preference in favour of Empire produce is extending and that it is being increasingly recognised as a potent factor in the development of the Empire. The fact has been recognised—

"that any expansion of the markets in the Empire Oversea (other things being equal) is more advantageous to the United Kingdom than a corresponding development elsewhere, because the Empire Oversea populations buy more British goods per head than the corresponding populations in other parts of the world."*

If, therefore, the Empire, both overseas and in the United Kingdom endeavours to meet the requirements of the British market in regard to timber it deserves to be met half way by British purchasers.

109. The "man in the street" has little or no opportunity for exercising his voluntary preference in favour of Empire timbers; but public bodies and big companies can do so in a most effective and permanent manner. They can give a lead

Action by public bodies and companies doubly valuable.

* "Britain's Industrial Future". Report of the Liberal Industrial Inquiry. Ernest Benn, Ltd., 1928.

in this matter in a way no other purchasers can. Their buildings and works are visited and seen by many. Their names carry weight. But it is not only by way of propaganda that their custom is helpful. The knowledge that large users are employing certain Empire timbers in itself justifies the provision of stocks and facilitates the carrying of them on a scale to supply the small user also. Thus the interest of public bodies and large companies is doubly valuable; it provides the most permanent and effective propaganda possible, and it assists the movement during its most difficult stage.

Action by
Office of
Works.

110. The Office of Works has brought to our notice some of their specifications which show a useful and interesting progression. In the earlier specifications foreign timbers were stipulated for certain uses. Later a choice was permitted between foreign woods and certain named Empire woods. Finally, on April 30, 1928, the Under-Secretary of State for the Home Department announced in the House of Commons that "as a general rule only British Empire timber will be specified for carpenters' and joiners' work in Office of Works' building contracts." There is room, however, for a wider adoption of this policy by a very much larger number of buyers.

Opportunity
for public
bodies and
companies.

111. A few years ago a Dominion Minister on being conducted round a recently-finished municipal building was told with pride that in that building were so many miles of panelling of Austrian oak, and somewhat similar quantities of other foreign woods. We would prefer that in the future a visitor may be told with pride that the woodwork he sees and the floors he walks upon are made from Empire timbers, whether he be visiting a town hall, a university, a bank, a company's offices or a school.

XXVI.—SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS.

112. We summarise our conclusions and recommendations as follows :—

(1) The adequacy of the world resources of timber, especially of soft woods, to meet the world consumption of the future, is causing grave anxiety to Forestry Authorities. We have not found this feeling of apprehension shared generally by members of the Timber Trade in the United Kingdom.

(2) We therefore suggest to the forthcoming British Empire Forestry Conference the need of satisfactory arrangements for collecting and maintaining statistics of the world demand for timber as well as of the merchantable supplies.

(3) The total value of timber, manufactured wood and wood pulp imported into and retained for consumption in the United Kingdom in 1927 was £67,000,000.

(4) It has been computed by the Forestry Commission that the total consumption in the United Kingdom in 1924 amounted to nearly 1,100 million cubic feet of standing timber (excluding imports of manufactures of wood) and that of this amount only 56 million cubic feet, or 5.4 per cent. were supplied from " home-grown " sources.

(5) Of the timber imported into the United Kingdom in the year 1926, approximately 95 per cent. of the soft woods and 70 per cent. of the hard woods were derived from foreign and not from Empire sources.

(6) It is from Canada that any large increase in supplies of Empire grown soft woods is to be expected and attention is specially directed to the possibilities of extending the use in the United Kingdom of Douglas Fir from British Columbia.

(7) The methods of conversion of timber in British Columbia are at present mainly designed for the needs of the North American markets. We suggest that if the export trade with the United Kingdom is to be increased there will have to be study of the special requirements of this market.

(8) We suggest that the utilization of lighter hardwoods in place of softwoods should be carefully explored.

(9) There is great potential wealth of hard woods in the Empire.

(10) To secure a wider use in the United Kingdom of Empire-grown timber from Overseas, there must be a supply regular and sufficient in quantity, suitable in quality and competitive in price, backed by adequate propaganda.

(11) In addition to the foregoing requirements, we think that in the case of " home-grown " timber there is room for co-operation among the woodland owners. We have discussed this in paragraphs 61-63 of this Report.

(12) We advocate a policy of restraint in regard to the number of varieties of new Empire timbers which are concurrently introduced to the British market.

(13) We propose that arrangements should be made to enable the Forest Products Research Laboratory at Princes Risborough to undertake work on behalf of the Overseas Empire as one of its normal functions and we recommend the attention of the Empire Marketing Board to this matter.

(14) The introduction of new Empire timbers involves risk and expense which exporters, with or without Government aid, must be prepared to undertake.

(15) We suggest that Governments might consider the advisability of appointing to London representatives with special knowledge of the timber of their own lands.

(16) The Empire Marketing Board might with advantage circulate lists of important instances in which Empire timbers may be seen in use in the United Kingdom.

(17) We direct the attention of public bodies to the opportunity of setting an example to timber users generally in the use of timbers of Empire growth. In this connection we call attention to the list given in Appendix III attached to this Report.

H. J. MACKINDER (*Chairman*).

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J. S. WARDLAW-MILNE		
F. N. BLUNDELL		
HARRISON WATSON	}	Canada.
W. A. WILSON		
J. A. COOPER	}	Commonwealth of Australia.
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JAMES PARE	}	New Zealand.
R. S. FORSYTH		
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VICTOR GORDON	}	Newfoundland.
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F. J. NEWTON		Southern Rhodesia.
G. GRINDLE	}	Colonies and Protectorates.
J. H. BATTY		
D. T. CHADWICK (<i>Secretary</i>).		

27th July, 1928.

APPENDICES.

APPENDIX I.

IMPORTS OF UNMANUFACTURED WOOD AND TIMBER, 1927.
(Compiled from the Trade Returns of the United Kingdom.)

Softwoods (Load = 50 Cubic Feet).

	Hewn.		Sawn.		Planed or Dressed.		Pitprops or Pitwood.	
	Loads.	Value £.	Loads.	Value £.	Loads.	Value £.	Loads.	Value £.
<i>Empire :</i>								
Canada	16,426	111,144	315,761	1,774,796	—	—	—	—
Total	16,426	111,144	315,761	1,774,796	—	—	—	—
<i>Foreign :</i>								
Russia	53,867	127,938	1,143,615	5,651,006	—	—	—	—
Finland	73,133	148,892	1,714,761	7,361,038	74,209	399,212	672,741	1,515,830
Latvia	—	—	438,676	1,897,808	—	—	—	—
Sweden	27,548	104,136	922,435	4,219,700	423,804	2,480,754	332,915	827,179
Norway	31,276	122,957	137,585	672,334	153,766	908,161	86,496	230,557
Poland (including Dantzig)	—	—	804,203	3,413,510	—	—	—	—
France... ..	—	—	—	—	—	—	1,138,091	1,494,798
Germany	2,062	4,673	55,833	248,252	1,807	10,238	—	—
United States of America	55,463	434,583	235,613	1,869,657	5,131	57,522	—	—
Total	243,349	943,179	5,452,721	25,333,305	658,717	3,855,887	2,230,243	4,068,364
Other Countries	60,174	188,842	257,363	1,138,904	29,899	182,980	634,250	1,389,460
Total (<i>Empire and Foreign</i>) ...	319,949	1,243,165	6,025,845	28,247,005	688,616	4,038,867	2,864,493	5,457,824

Miscellaneous (Soft and Hard).

	Staves.		Sleepers.		Veneers.		Not otherwise Specified.	
	Loads.	Value £.	Loads.	Value £.	Loads.	Value £.	Loads.	Value £.
Total (<i>Empire and Foreign</i>) ...	104,159	739,871	248,390	963,177	3,803	205,703	2,869	17,995

Hardwoods.

	Hewn.		Sawn.		Total (Hewn and Sawn).
	Cubic Feet.	Value £	Cubic Feet.	Value £	Value £
MAHOGANY.					
<i>Empire and Foreign</i>	2,287,097	596,260	1,680,813	609,376	1,205,636
ALL OTHER SORTS.					
<i>Empire :</i>					
British East Indies	79,034	43,919	1,663,250	853,767	897,686
Canada	321,305	77,935	3,824,812	605,921	683,856
Total	400,339	121,854	5,488,062	1,459,688	1,581,542
<i>Foreign :</i>					
Russia	16,378	2,996	—	—	2,996
Finland	131,750	10,501	839,831	105,860	116,361
Poland	—	—	1,261,085	224,811	224,811
Japan	—	—	462,738	157,995	157,995
United States of America	700,421	141,696	16,432,653	3,868,581	4,010,277
Total	848,549	155,193	18,996,307	4,357,247	4,512,440
<i>Other Countries</i>	2,714,782	428,767	3,665,481	1,028,627	1,457,394
Total, all other sorts	3,963,670	705,814	28,149,850	6,845,562	7,551,376
Total, Hardwoods	6,250,767	1,302,074	29,830,663	7,454,938	8,757,012

APPENDIX II.

IMPORTS OF HARDWOODS, 1926.

(Compiled from the Trade Returns of the United Kingdom).

Oak.

	Hewn. .		Sawn.		Total (Hewn and Sawn).
	Cubic feet.	Value £.	Cubic feet.	Value £.	Value £.
<i>Empire :</i>					
Irish Free State	28,920	2,585	7,897	1,320	3,905
Canada	5,020	1,594	14,066	3,509	5,103
Australia	—	—	41,472	10,929	10,929
New Zealand	—	—	5,400	1,685	1,685
Other Countries	3,566	785	2,657	883	1,668
Total	37,506	4,964	71,492	18,326	23,290
<i>Foreign :</i>					
Russia	53,142	15,796	21,607	6,642	22,438
Latvia	56,535	17,584	—	—	17,584
Poland (including Dantzig)	515,016	80,456	578,968	111,751	192,207
Italy	3,733	1,210	253,851	120,658	121,868
Austria	—	—	45,234	20,859	20,859
Serb-Croat-Slovene	—	—	186,296	81,956	81,956
Japan	37,859	9,178	443,441	153,644	162,822
United States of America	94,259	20,724	7,324,304	1,755,031	1,775,755
Other Countries	10,207	2,047	101,332	32,215	34,262
Total	770,751	146,995	8,955,033	2,282,756	2,429,751
Total, Oak ...					2,453,041

Mahogany.

<i>Empire :</i>					
British West Africa	1,069,331	247,282	155,735	34,561	281,843
British Honduras	126,796	74,790	—	—	74,790
British India	—	—	2,951	1,552	1,552
British North Borneo	—	—	24,842	5,686	5,686
Other Countries	119,062	19,556	5,721	2,764	22,320
Total	1,315,189	341,628	189,249	44,563	386,191
<i>Foreign :</i>					
France	83,555	23,328	56,535	16,595	39,923
French West Africa	1,021,824	205,791	123,580	26,240	232,031
United States of America	48,266	21,675	1,228,067	518,593	540,268
Cuba	43,873	18,383	—	—	18,383
Philippines and Guam	—	—	2,776	741	741
Brazil	—	—	68,458	12,909	12,909
Other Countries	56,731	14,877	37,459	13,808	28,685
Total	1,254,249	284,054	1,516,875	588,886	872,940
Total, Mahogany					1,259,131

Teak.

	Hewn.		Sawn.		Total (Hewn and Sawn).
	Cubic Feet.	Value £.	Cubic Feet.	Value £.	Value £.
<i>Empire :</i>					
British India	43,704	20,347	1,794,363	898,600	918,947
Straits Settlements	—	—	4,275	2,445	2,445
Other Countries	—	—	10,920	2,676	2,676
Total	43,704	20,347	1,809,558	903,721	924,068
<i>Foreign :</i>					
Java	1,350	569	10,098	3,521	4,090
French Indo-China	—	—	53,777	20,016	20,016
Siam	5,925	3,015	214,249	110,445	113,460
Philippines and Guam	—	—	5,221	1,538	1,538
Other Countries	2,329	686	15,133	5,328	6,014
Total	9,604	4,270	298,478	140,848	145,119
Total, Teak ...					1,069,186

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Walnut.

BOMBAY

<i>Empire :</i>					
Nigeria	8,325	1,763	—	—	1,763
Canada	—	—	36,645	36,560	36,560
Other Countries	728	218	10,843	4,254	4,472
Total	9,053	1,981	47,488	40,814	42,795
<i>Foreign :</i>					
Russia	9,800	2,000	—	—	2,000
France	4,210	1,519	102,363	46,677	48,196
French West Africa	8,933	906	—	—	906
United States of America	3,985	1,407	393,708	217,747	219,154
Other Countries	2,821	1,091	13,536	4,148	5,239
Total	29,749	6,923	509,607	268,572	275,495
Total, Walnut ...					318,290

Other Sorts.

	Hewn.		Sawn.		Total (Hewn and Sawn).
	Cubic feet.	Value £.	Cubic feet.	Value £.	Value £.
<i>Empire :</i>					
Irish Free State	286,085	18,409	139,729	12,940	31,349
British India	32,824	17,538	45,868	27,675	45,213
Australia	82,830	14,595	552,790	140,086	154,681
Canada	553,204	107,902	2,879,149	470,101	578,003
West Indies	15,244	4,749	—	—	4,749
British Honduras	3,140	1,520	—	—	1,520
British Guiana	123,695	45,113	—	—	45,113
Other Countries	20,782	5,439	93,104	33,858	39,297
Total	1,117,804	215,265	3,710,640	684,660	899,925
<i>Foreign :</i>					
Finland	130,786	13,120	645,865	91,795	104,915
Latvia	115,560	13,406	—	—	13,406
France and French West Africa.	110,278	25,783	107,376	23,392	49,175
Italy	4,534	584	101,456	22,489	23,073
Austria	—	—	108,149	22,105	22,105
Serb-Croat-Slovene	—	—	107,520	22,387	22,387
United States of America	953,740	152,720	6,084,930	1,363,583	1,516,303
Philippines and Guam	—	—	164,898	41,135	41,135
Other Countries	289,779	91,952	361,899	61,872	153,824
Total	1,604,677	297,565	7,682,093	1,648,758	1,946,323
Total, Other sorts					2,846,248

APPENDIX III.

A LIST GIVING A FEW INSTANCES OF THE USE OF EMPIRE TIMBERS IN WORKS
AND BUILDINGS IN GREAT BRITAIN.

(No instances are given of "home-grown" timber, or of teak and mahogany, as it is assumed that most people are familiar with cases in which they have been used.)

CANADIAN TIMBERS.

Western Hemlock.

Baring Brothers' Bank, Limited, Bishopsgate, London.	Framing.
Daily Express Offices, London	Framing for Board Room.
St. George's Church, Kidderminster	Choir stalls and seating.

Maple.

Hudson Bay Company Offices, London	Flooring.	
Many buildings erected by the Office of Works, such as:—	}	
Metropolitan Telephone Exchange, London		Flooring.
Letter-sorting office, Mount Pleasant, London.		
Telegraph factory and stores, Birmingham		
Letter-sorting office, Cardiff		
Post Office, Walsall		

Douglas Fir.

Civil Service Supply Association, London ...	Framing.
Grosvenor House, London	Flooring.
Many buildings erected by the Office of Works, such as:—	}
Telephone Exchanges at Kensington, Sutton, Colchester and elsewhere.		Flooring.
Pier, Clacton-on-Sea	Piling.
"Princess Kathleen" and "Princess Mar- guerite," built by Messrs. John Brown & Co., Clydebank, for C.P.R. Company.	Decks.

AUSTRALIAN TIMBERS.

Tasmanian Oak.

Lloyds, Leadenhall Street, London	Flooring
London County Council Schools at Woolwich and Hammersmith.	Flooring.
Lyons Corner House, Oxford Street, London ...	Flooring.
Seamen's Hospital, Greenwich	Flooring.

Jarrah.

Atlas Insurance Company, Cheapside, London	Flooring.
Tonbridge School	Flooring.
Commercial Union Assurance Company, Birmingham.	Flooring.
Co-operative Wholesale Society, King's Lynn, Norfolk.	Flooring.
Aerodromes at Spittlegate and Patchway ...	Flooring.

Australian Walnut.

Southern Railway Company 1st-class coaches ...	Panelling.
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Silky Oak.

Lyons Corner House, Oxford Street, London ...	Tables.
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INDIAN AND BURMA TIMBERS.

Laurel Wood.

London County Hall: Voting lobby	Panelling.
P. and O. Banking Corporation, Leadenhall Street, London.	Panelling.
Guardian Insurance Company, King William Street, London.	Panelling.
Shell Mex, Limited, London	Panelling to Board Room.
Messrs. Harrods, London: Departmental stores	Panelling.

Silver Greywood.

County Fire Office, Piccadilly Circus, London...	Panelling.
L.M.S. Railway 1st-class coaches of "Royal Scot."	Panelling.
Offices of Messrs. Blades, East and Blades, London.	Doors.
General Electric Company, Birmingham ...	Panelling.

Gurjun.

Cox's Bank, Limited, Waterloo Place, London	Flooring.
P. and O. Banking Corporation, Leadenhall Street, London.	Flooring.
Guardian Assurance Co., King William Street, London.	Flooring.
Bush House, Aldwych, London	Flooring.
Royal Exchange, Glasgow	Flooring.
St. Michael's Church, Mill Hill	Flooring.
Several Railway Companies	Coachwork.

Padank.

All Saints' Church, Paddington, London ...	Panelling, pews, doors.
Bovis, Limited, London	Panelling to Board Room.
Barclays Bank, Limited: branches at London, Stockton-on-Tees and Hastings.	Counters.

Pyankadu.

Bridge across Thames, Henley.

White Mahogany.

Barclays Bank, Limited (branches at London and Stockton-on-Tees).	Fittings.
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BRITISH WEST AFRICAN TIMBERS.

Iroko.

Forest products research laboratory, Princes Risborough.	Laboratory tables.
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African Walnut.

Emmanuel College, Cambridge	Staircase, panelling, etc.
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BRITISH GUIANA TIMBERS.

Greenheart.

Southern Railway Company	Dock gates at Southampton.
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CEYLON TIMBERS.

Satinwood.

Lyons Popular Café, Piccadilly, London ...	Panelling.
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BRITISH NORTH BORNEO TIMBERS.

White Cedar.

Great Western Railway Company	Under - frames of coaches.
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TENTH REPORT.

TIMBER.

*Presented by the Secretary of State for Dominion Affairs
to Parliament by Command of His Majesty
August, 1928*

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