THE TIMBER TRADES.

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GENERAL REPORT.

Contents.

Introductory.

The following general report deals with the trades engaged in the sawing and conversion of timber and the manufacture of furniture, crates, boxes, carriages, carts, wagons, brushes, barrels, baskets and wickerwork.

Measured by the numbers engaged in the various trades, the largest member of the group is the Furniture, Cabinet-making and Upholstery Trade, which accounted in 1924 for 83,897 persons employed, or 41 per cent. of the group total of 203,950 persons. The next largest is the Timber (Sawmilling, etc.) Trade, with 66,246 persons employed, or 32 per cent. of the group total.

Each of the trades included in the group forms the subject of a separate report, in which the detailed results of the 1924 Census of Production are set out, and such comparisons as are possible with

the results of the Censuses for 1912 and 1907 are made. The object of the present general report is to bring together the principal results for the whole group of trades, and, in addition, to set out certain particulars (e.g., as to fuel consumption) which are more conveniently dealt with here than in the separate trade reports.

Principal results for 1924.

The number of separate returns received from firms engaged in the Timber Trades group in 1924 was 17,525. About 6,800 firms to which schedules were sent did not furnish returns, but the great majority of these firms had very small establishments, and they included a number which were no longer carrying on business at the end of the censal year. On the basis of the information available, it is estimated that they did not employ more than about 18,000 persons in all and that their aggregate net output was probably not in excess of £2,500,000. These figures represent an omission of, at most, about 8·8 per cent. and 6·9 per cent. respectively of the total figures for the group; and the absence of returns from the firms in question affects in a minor degree, at most, the uses made of the figures in this general report.

The main particulars obtained for 1924 are set out in the following table :—

Timber Trades.

Output in 1924.*

Trade.	Gross output (selling value of goods made and value of work done). (1)	Cost of materials used and amount paid to other firms for work given out. (2)	Net output [excess of col. (1) over col. (2)]. (3)	Persons employed (except outworkers). (4)	Net output per person employed, as shown in col. (4). (5)
	£'000	£'000	£'000	Number	£
Timber (Sawmilling, etc.)	28,791	16,565	12,226	66,246	185
Furniture, Cabinet-making and Upholstery	31,425	15,018	16,407	83,897	196
Wooden Crates, Cases, Boxes and Trunks	6,388	3,638	2,750	14,726	187
Carriage, Cart and Wagon	5,758	2,583	3,175	19,613	162
Brush-making	3,578	1,817	1,761	11,192	157
Coopering	2,861	1,774	1,087	4,786	227
Basket and Wicker-work	836	325	511	3,491	146
TOTAL—UNITED KINGDOM	79,637	41,720	37,917	203,951	186
England and Wales	68,864	35,598	33,266	177,598	187
Scotland	9,992	5,697	4,295	24,045	179
Northern Ireland	781	425	356	2,308	154

* Not including the output of, nor the persons employed by, H.M. Office of Works, particulars of which are given in the report on Government Departments (see page 434). The value of such output is also stated on page 113.

Comparability of results with those for 1912 *and* 1907.

The scope of the Census was not quite the same in the three censal years, and the comparability of the totals for 1924 is affected by the changes referred to in the following paragraphs :—

(1) The Censuses of 1907 and 1924 extended to all firms, however small, but in 1912 firms employing not more than five persons (excluding proprietors) were required to state only the average number of persons employed by them in the year. The exemption of the small firms in 1912 resulted in the exclusion of an important proportion of some of the Timber Trades and, both for that reason and because the war interrupted the task of dealing with incomplete and incorrect returns, the information available for that year, for the group as a whole, is not sufficiently complete to warrant its use for detailed comparisons. Accordingly the 1907 figures only are, except in respect of power equipment, taken for comparison with those for 1924 in this general report.

(2) The Census of 1907 covered Great Britain and the whole of Ireland, but that of 1924 applied only to Great Britain and Northern Ireland. According to the Census of Production carried out by the Government of the Irish Free State in respect of the year 1926, the Timber Trades carried on in that country employed about 4,070 persons with a gross output of about £1,336,000, that is to say, about 2 per cent. of the total number of persons employed and about 1·7 per cent. of the gross output shown for the Timber Trades in the United Kingdom in 1924.

(3) In any comparison of figures representing money values, the changes in the level of prices which occurred in the period between the first and third Censuses should be kept in mind.

Production.

It is difficult to find a satisfactory basis on which to compare production in the several trades in the same year, or in any trade or trades in different years. Obviously, no comparisons between trades could be based on the aggregate quantities of goods produced owing to their varied character, even if the necessary information were available for this purpose. The gross output values recorded in the Census of Production are affected in varying degrees by the duplication of goods or processes which they involve, and hence they do not form a practicable basis for comparisons. Some of the difficulties can be avoided by basing comparisons on net output, which, being arrived at by deducting, from the value of the gross output, the total cost of materials used and the amount paid to other firms for work given out to them, represents completely and without duplication the value added to the materials in the course of manufacture. The net output thus constitutes for any industry

the fund from which wages, salaries, rent, royalties, rates, taxes depreciation, advertisement and sales expenses, and all other similar charges have to be provided, as well as profits ; and if the net output for any trade is divided by the number of persons employed by firms in that trade, the resulting figure of net output per head furnishes a basis of comparison between the positions of different trades in the same year (or the same trade in different years) which takes account of differences in the numbers of persons employed and the continuity of their work. The use of net output per head as a basis of comparison was discussed at length in the Final Report on the First Census of Production (1907), where it was pointed out that " as the net output is the fund out of which all charges on industry, except the cost of materials as delivered at the works, are met, it will naturally vary with the amount of those charges " (page 12 of Cd. 6320). The conclusion reached was that " the average net output per head gives a somewhat fictitious representation of the condition of a trade " and that it constitutes only a rough measure on which to base comparisons (pages 14, 15). Hence, while it remains true that the net output for a trade represents a fact, i.e., the value added to materials by capital and labour, and constitutes the best available basis for the comparisons in view, the qualifications to which its use for this purpose is subject must be kept in mind.

Net output per head in 1924 *and* 1907.—The following table shows, for each of the trades included in the Timber group, the net output per head of persons employed in 1924 and 1907 :—

*Net output per head of persons employed (excluding outworkers).**

Trade.	1924.	1907.
	£	£
Timber (Sawmilling, etc.)	185	82
Furniture, Cabinet-making and Upholstery ..	196	83
Wooden Crates, Cases, Boxes and Trunks ..	187	91
Carriage, Cart and Wagon	162	82
Brush-making	157	77
Coopering	227	91
Basket and Wicker-work	146	67
ALL TRADES	186	83

The net output per head of persons employed increased by 124 per cent. for the group as a whole, the greatest increase (149 per cent.) being recorded in the Coopering Trade and the smallest (98 per cent.) in the Carriage, Cart and Wagon Trade. The increase in the net output per head in the Furniture, Cabinet-making and Upholstery Trade was 136 per cent. and in the Timber Trade 126 per cent.

* It has been ascertained from the Census records that the exclusion of particulars relating to Southern Ireland from the 1907 figures would not materially affect the results shown.

Relatively to the group averages, there were no outstanding changes in the net output per head in individual trades for each year. The most important changes occurred in the Coopering Trade, in which the net output per person employed rose from 10 per cent. above the average in 1907 to 22 per cent. above the average in 1924 ; in the Carriage, Cart and Wagon Trades, in which the net output per head fell from 1 per cent. below the group average in 1907 to 13 per cent. below the group average in 1924 ; and in the Wooden Crates, Cases, etc. Trades, where the net output per head fell from 10 per cent. above the group average in 1907 to less than 1 per cent. above the average in 1924.

Employment.

Employment in 1924.

Classification of persons employed in a specified week.—The following table classifies by sex, age and character of employment the numbers of persons (excluding outworkers) who were recorded as employed in the various Timber Trades in the week ended 18th October, 1924 :—

Number of persons (excluding outworkers) employed in the week ended 18th October, 1924.

Trade.	Operative staff.				Administrative, technical and clerical staff.			
	Males.		Females.		Males.		Females.	
	Under 18.	Total.	Under 18.	Total.	Under 18	Total.	Under 18.	Total.
	(In thousands)							
Timber (Sawmilling, etc.)	9·0	53·3	0·9	3·0	445	10,098	202	1,256
Furniture, Cabinet-making and Upholstery	10·0	56·9	4·2	16·4	390	9,778	350	2,014
Wooden Crates, Cases, Boxes and Trunks..	3·3	12·7	0·3	1·3	68	1,119	34	234
Carriage, Cart and Wagon	2·6	13·7	0·6	1·6	75	4,018	79	390
Brush-making ..	0·6	4·9	1·2	4·8	57	1,039	41	337
Coopering	0·6	4·2	*	*	16	532	13	81
Basket and Wicker-work	0·2	1·9	0·3	0·9	6	531	20	93
TOTAL ..	26·3	147·6	7·5	28·0	1,057	27,115	739	4,405

* Less than 50.

The proportion of female operatives was greatest in the Brush-making Trade (nearly 50 per cent.), the Basket and Wicker-work Trade (33 per cent.), and the Furniture, Cabinet-making and Upholstery Trade (22 per cent.). These three trades accounted for 79 per cent. of the female operatives in the whole group.

Monthly fluctuations in employment.—In order to ascertain what fluctuations in employment there might be in the course of the censal year, firms were required to state the actual numbers of the operative staff employed in one week in each month. The figures for individual trades are shown in the respective reports, and the following table gives the monthly aggregates for all the trades together :—

Operative staff (excluding outworkers) in the Timber Trades in 1924.

Week ended.	Males.	Females.	Total.
12th January	139,814	27,012	166,826
16th February	140,369	27,122	167,491
15th March	142,059	27,381	169,440
12th April	144,090	27,946	172,036
17th May	145,181	28,369	173,550
21st June	145,661	28,210	173,871
19th July	143,817	27,853	171,670
16th August	142,552	27,266	169,818
13th September	146,268	27,779	174,047
18th October	147,613	28,096	175,709
15th November	148,368	28,767	177,135
13th December	148,696	28,886	177,582
AVERAGE FOR THE 12 MONTHS	144,541	27,890	172,431

Apart from a decrease in July and August, employment improved from month to month throughout the year. The total number employed at the end of the year exceeded the number employed at the beginning by 10,756, or 6·4 per cent., the increase being composed of 8,882 males and 1,874 females, or 6·4 per cent. and 6·9 per cent. respectively.

The average numbers employed were divided between males and females in the proportion of 838 to 162.

Employment in 1924 *and* 1907.

The following table shows the average numbers of male and female operatives (wage earners), and administrative, technical and clerical staff (salaried persons), in each of the Timber Trades in the two censal years. The figures are exclusive of outworkers. The average numbers shown in this table and in the other table on page 83 have been determined in the manner explained in Note (18) on page xi.

The total numbers employed decreased between 1907 and 1924 by 19,518, or 8·7 per cent. The greatest decrease was in the Carriage, Cart and Wagon Trade in which the numbers employed were 16,749, or about 46 per cent., less in 1924 than in 1907. The Timber Trade showed a decrease of 11,977, or 15 per cent., and the Coopering Trade and the Basket and Wicker-work Trade also showed small decreases.

The numbers of persons employed in the Furniture, Cabinet-making and Upholstery Trade increased by 7,482, or nearly 10 per cent., and in the Wooden Crates, Cases, etc. Trades by 1,953, or 15 per cent. There was no appreciable change in the total numbers

employed in the Brush-making Trade, a decrease of 920 males being offset by an increase of 970 females.

Average numbers (excluding outworkers) employed in 1924 *and* 1907 *in the several Timber Trades.*

Trade.		Operatives (wage earners).		Administrative technical and clerical staff (salaried persons).		Total.
		Males.	Females.	Males.	Females.	
Timber (Sawmilling, etc.)	1924	51,996	2,896	10,098	1,256	66,246
	1907	*66,767*	*2,502*	*8,633*	*321*	*78,223*
Furniture, Cabinet-making and Upholstery	1924	55,824	16,281	9,778	2,014	83,897
	1907	*57,523*	*11,757*	*6,315*	*820*	*76,415*
Wooden Crates, Cases, Boxes and Trunks	1924	12,093	1,280	1,119	234	14,726
	1907	*10,749*	*1,244*	*713*	*67*	*12,773*
Carriage, Cart and Wagon	1924	13,621	1,584	4,018	390	19,613
	1907	*31,188*	*743*	*4,255*	*176*	*36,362*
Brush-making	1924	4,958	4,858	1,039	337	11,192
	1907	*5,838*	*4,022*	*1,079*	*203*	*11,142*
Coopering	1924	4,129	44	532	81	4,786
	1907	*4,543*	*12*	*364*	*20*	*4,939*
Basket and Wicker-work	1924	1,920	947	531	93	3,491
	1907	*2,670*	*542*	*372*	*31*	*3,615*
ALL TRADES	1924	144,541	27,890	27,115	4,405	
	1907	*179,278*	*20,822*	*21,731*	*1,638*	
TOTAL	1924	172,431		31,520		203,951
	1907	*200,100*		*23,369*		*223,469*

Classification of average numbers employed.—The following table shows the distribution, according to sex, age and character of employment, of the average number of persons (excluding outworkers) employed in the Timber group of trades in 1924 and 1907 :—

Average numbers (excluding outworkers) employed in all Timber Trades in the two censal years.

Sex and age.	1924.		1907.	
	Operative staff.	Total staff.	Wage earners.	Total staff.
Males :—				
Under 18	25,756	26,813	27,174	28,666
Over 18	118,785	144,843	152,104	172,343
TOTAL	144,541	171,656	179,278	201,009
Females :—				
Under 18	7,456	8,195	5,136	5,381
Over 18	20,434	24,100	15,686	17,079
TOTAL	27,890	32,295	20,822	22,460
Males and females :—				
Under 18	33,212	35,008	32,310	34,047
Over 18	139,219	168,943	167,790	189,422
TOTAL	172,431	203,951	200,100	223,469

Sex and age distribution of operatives.—Male labour predominated in the Timber Trades in both years. In the group as a whole, male operatives formed, in 1924, 84 per cent. of the total operative staff, 78 per cent. of the total number of young persons under 18 and 85 per cent. of the adult operatives. The total number of operatives employed in the group in 1924 was less than in 1907 by 27,669, or 14 per cent.; there was, however, an increase of 7,068, or 34 per cent., in the total number of female operatives employed.

Administrative, technical and clerical staff.—The increase in the administrative, technical and clerical staff in 1924 (described in 1907 as salaried persons) was 8,151, or 35 per cent. In this increase males accounted for 5,384, or 25 per cent., and females for 2,767, or 169 per cent. The increase in males probably signified an increase in management and sales staffs; the increase in females probably related largely to clerical staff, reflecting a widespread adoption of more detailed accounting methods, and to clerical labour associated with selling organisation.

The proportion of males in the administrative staff in 1924 was 86 per cent. and of females 14 per cent., as compared with 93 per cent. and 7 per cent., respectively, in 1907.

Outworkers.—In addition to the staff dealt with in the preceding paragraphs, employment was also given in some trades to outworkers, i.e., persons who worked in their own homes on materials given out to them by their employers. The following table shows the average numbers of such outworkers employed in the Timber Trades in 1924 and 1907 :—

Trade.	1924.			1907.		
	Males.	Females.	Total.	Males.	Females.	Total.
Furniture, Cabinet-making and Upholstery ..	240	384	624	300	492	792
Wood Crates, Cases, Boxes and Trunks	—	—	—	2	379	381
Brush-making	(Not ascertained)			59	1,543	1,602
Basket and Wicker-work	7	—	7	17	14	31
TOTAL	247	384	631	378	2,428	2,806

Wages in 1924.

The following table summarises the information contained in the reports on the separate trades as to the amount of wages paid by firms in those trades in 1924. The particulars of wages shown in column (5) of the table are those ascertained by the Ministry of Labour as a result of the voluntary enquiry undertaken by that Department into wages and hours of labour in the United Kingdom in 1924. The numbers of operatives shown in column (1) are those returned to the Census of Production as employed by the firms concerned in the week ended 18th October, 1924. The proportion of each trade represented by the firms that furnished particulars of their wage-bills is shown in columns (2) and (4) on the bases of numbers of operatives employed and of net output respectively.

Trade.	Firms furnishing returns of wages.					
	Operatives employed.		Net output.		Wages paid.	
	Number. (1)	Proportion of trade total. (2)	Amount. (3)	Proportion of trade total. (4)	Amount. (5)	Proportion of net output. (6)
		Per cent.	£'000	Per cent.	£'000	Per cent.
Timber (Sawmilling, etc.)	22,603	41	5,093·4	42	2,802·4	55·0
Furniture, Cabinet-making and Upholstery	31,987	44	6,797·4	41	3,990·4	58·6
Wooden Crates, Cases, Boxes and Trunks ..	8,550	64	1,643·8	60	961·3	58·5
Carriage, Cart and Wagon	6,893	45	1,575·0	50	1,081·2	68·6
Brush-making	6,266	64	1,100·8	62	594·9	54·0
Coopering	1,898	45	564·6	52	328·2	58·1
Basket and Wicker-work	1,070	37	193·8	38	113·4	58·5
TOTAL ..	79,267	45	16,968·8	45	9,871·8	58·2

Mechanical Power.

The power equipment of factories consists in the first instance of the prime movers installed in the works, part being used to apply power mechanically and part to actuate generators for the production of electrical energy. Only a portion of that electrical energy is used for power, i.e., to drive electric motors, the remainder being used for lighting, heating, etc., and for manufacturing purposes. In addition, many factories derive part or all of their power from electricity purchased and used for driving electric motors.

Power equipment in 1924, 1912 *and* 1907.—The particulars furnished at the three Censuses regarding prime movers and electric generators in factories in the Timber Trades are shown in the following table. Particulars of electric motors were not obtained in 1907, and particulars relating to 1924 and 1912 only can be given.

The summary figures of power equipment secured at the 1912 Census are included in this and the following paragraphs, though they are omitted from the individual trade reports. The exclusion in that year of firms employing not more than five persons and the incompleteness of many of the returns rendered the results secured for the most part ineffective for purposes of comparison. The figures relating to power equipment are, however, likely to have been affected in a less degree than other aggregates by the omission of

the small enterprises. The main interest of the figures given for 1912 lies in the indication which they afford of the increase that has occurred since that year in the use of electricity, particularly purchased electricity, as a source of power. The omission of small firms in 1912 may have had a particular importance in reference to this feature.

In connexion with the omission of the Irish Free State from the 1924 Census (see page 79) it may be mentioned that, according to the Census of Production conducted by the Free State Government in respect of the year 1926, the total capacity of prime movers in the Timber Trades in that year was 6,600 horse-power, or about 4 per cent. of the total recorded for the United Kingdom in 1924; and the capacity of the electric motors driven by purchased electricity was 1,400 horse-power, or about 1 per cent. of the United Kingdom figure for 1924. It follows that the absence of the Irish Free State from the 1924 Census does not appreciably affect the comparability of the general results for that year with those for 1907 and 1912.

Power equipment of the several Timber Trades.

Trade.	Prime movers.			Electric generators.		
	1924.	1912.	1907.	1924.	1912.	1907.
	Thousand H.P.			Thousand Kw.		
Timber (Sawmilling, etc.)	95·4	75·9	97·3	8·2	3·7	2·3
Furniture, Cabinet-making and Upholstery ..	20·1	18·5	22·1	3·5	3·8	2·4
Wooden Crates, Cases, Boxes and Trunks ..	24·2	11·5	10·2	1·6	0·7	0·1
Carriage, Cart and Wagon	9·4	7·6	10·5	0·2	0·8	0·7
Brush-making	4·3	2·2	2·1	1·5	0·4	0·4
Coopering	2·0	2·2	2·4	0·1	0·1	*
Basket and Wicker-work	0·2	0·3	0·1	*	—	—
TOTAL	155·6	118·2	144·7	15·1	9·5	5·9

* Less than 50 kw.

Trade.	Electric motors driven by electricity generated in same works.		Electric motors driven by purchased electricity.		All electric motors.	
	1924.	1912.	1924.	1912.	1924.	1912.
	Thousand H.P.		Thousand H.P.		Thousand H.P.	
Timber (Sawmilling, etc.)	10·7	3·9	72·3	15·0	83·0	18·9
Furniture, Cabinet-making and Upholstery ..	3·6	2·9	30·8	8·0	34·4	10·9
Wooden Crates, Cases, Boxes and Trunks ..	1·6	0·8	15·9	5·6	17·5	6·4
Carriage, Cart and Wagon	0·1	0·3	6·8	3·5	6·9	3·8
Brush-making	1·7	0·4	2·2	0·5	3·9	0·9
Coopering	0·2	0·1	3·1	0·8	3·3	0·9
Basket and Wicker-work	†	—	0·1	†	0·1	†
TOTAL	17·9	8·4	131·2	33·4	149·1	41·8

† Less than 50 H.P.

The distribution of the power equipment recorded in 1924 among the three geographical areas covered by the Census was as follows :—

Area.	Prime movers.	Electric generators.	Electric motors driven by	
			Electricity generated in same works.	Purchased electricity.
	Th. H.P.	Th. Kw.	Th. H.P.	Th. H.P.
England and Wales	127·6	11·8	14·9	117·2
Scotland	23·9	2·6	2·1	13·5
Northern Ireland	4·1	0·7	0·9	0·5
TOTAL	155·6	15·1	17·9	131·2

Classification of power equipment in 1924, 1912 *and* 1907.—The following table, which relates to the power equipment of all the trades taken together, classifies the prime movers according to kinds, the electric generators according to the description of prime movers by which they were driven, and the electric motors according as they were actuated by purchased electricity or by electricity generated in the same factory or works.

Power equipment.	1924.	1912.	1907.
	Th. H.P.	Th. H.P.	Th. H.P.
PRIME MOVERS :—			
Reciprocating steam engines	80·0	69·3	84·7
Steam turbines	1·6	1·4	0·5
Gas and oil engines	71·8	46·0	54·1
Water power	2·2	1·5	5·3
Other power	—	—	0·1
TOTAL	155·6	118·2	144·7
	Th. Kw.	Th. Kw.	Th. Kw.
ELECTRIC GENERATORS :—			
Driven by—			
Reciprocating steam engines	9·3	5·7	4·2
Steam turbines	1·0	0·8	†
Gas and oil engines	4·8	2·9	1·7
Water power	†		
Other prime movers	—		
TOTAL	15·1	9·4	5·9
	Th. H.P.	Th. H.P.	Th. H.P.
ELECTRIC MOTORS :—			
Driven by—			
Electricity generated in same works ..	17·9	8·4	*(not ascertained)
Purchased electricity	131·2	33·4	
TOTAL	149·1	41·8	..

* The total amount of electrical energy recorded as purchased for all purposes in 1907 was 7,761,000 Board of Trade units (kilowatt-hours).

† Less than 50 H.P.

Power equipment in use and not in use in 1924.—The firms that made returns to the Census for 1924 were required to distinguish between the prime movers, electric generators, and electric motors ordinarily in use in the course of the year and those that were in reserve or idle. The proportion not in use should not be taken as a direct measure of the inactivity of trade during the year. While some of the engines, generators, and motors were not in use on account of lack of orders for goods, some were idle because they were normally in reserve against a breakdown or sudden rush of trade and others may have been in various stages of obsolescence, awaiting the time for being dismantled. The particulars recorded as to power ordinarily in use and not in use in 1924 are given in the following table :—

Power ordinarily in use and not in use in the Timber Trades in 1924.

Trade.	Prime movers.		Electric generators.		Electric motors.	
	(*a*) Ordinarily in use ; (*b*) not in use.	Percentage not in use.*	(*a*) Ordinarily in use ; (*b*) not in use.	Percentage not in use.*	(*a*) Ordinarily in use ; (*b*) not in use.	Percentage not in use.*
	Th.H.P.		Th.Kw.		Th.H.P.	
Timber (Sawmilling, etc.) .. .. (*a*)	89·2	6·5	7·1	12·6	76·2	8·1
(*b*)	*6·2*		*1·1*		*6·8*	
Furniture, Cabinet-making and Upholstery .. .. (*a*)	18·2	9·7	3·0	14·3	32·7	4·9
(*b*)	*1·9*		*0·5*		*1·7*	
Wooden Crates, Cases, Boxes and Trunks .. .. (*a*)	*22·8*	5·7	*1·2*	26·7	*15·4*	12·2
(*b*)	*1·4*		*0·4*		*2·1*	
Carriage, Cart and Wagon .. .. (*a*)	8·9	5·5	0·2	8·3	6·5	5·0
(*b*)	*0·5*		‡		*0·4*	
Brush-making .. (*a*)	3·3	22·8	1·0	33·8	3·6	8·9
(*b*)	*1·0*		*0·5*		*0·3*	
Coopering .. .. (*a*)	2·0	0·8	0·1	15·3	3·0	8·5
(*b*)	†		‡		*0·3*	
Basket and Wicker-work .. .. (*a*)	0·2	16·8	‡	—	0·1	—
(*b*)	†		—		—	
TOTAL .. (*a*)	144·6	7·1	12·6	16·5	137·5	7·8
(*b*)	*11·0*		*2·5*		*11·6*	

* Based in each case upon the actual figures returned.
† Less than 50 H.P.
‡ Less than 50 Kw.

Power available for mechanical and electrical application in 1924.—In order to ascertain the actual amount of power available in the several trades, and the proportion of that power applied electrically, the capacity of the prime movers used to actuate electric generators must be replaced by the capacity of the electric motors driven by the electricity so produced. How far it may be legitimate to add together the capacity of engines applying, or intended to apply, power mechanically and the capacity of the electric motors, so as to obtain the power capacity of a factory using both forms of energy, will depend on the organisation of the factory. The information supplied furnishes no guidance as to the effective capacity of the power equipment, for, on the one hand, actual working capacity is not necessarily identical with the indicated horse-power nor with that which an engine was originally built to develop, data which served largely as the basis of returns ; and, on the other hand, it cannot be assumed that an engine can run uniformly at its peak load, and some engine-power is generally provided as a reserve against breakdowns and not for regular use. In particular, a series of motors (whose aggregate capacity would be returned to the Census) may be installed to run on successive processes, some of which are carried on intermittently as the materials to be treated become available, so that the series always includes some units not actually in operation. In such cases the aggregate horse-power of the motors, being greater than the power called for at any moment, may be greater than the horse-power of the prime movers required to actuate the generators from which the series of motors is driven. Since, however, the mechanical power available per operative employed is regarded as significant of the efficiency of an organisation, an attempt has been made to provide such a measure, though the result can only be regarded as a rough indication claiming no high degree of precision.

In calculating this measure, the power allocated for driving electric generators has to be deducted from the total capacity of prime movers ; for this purpose, 746 kilowatts of electrical energy are taken as the equivalent of 1,000 horse-power of mechanical energy, and an average loss of 10 per cent. is allowed in the conversion of mechanical into electrical energy, except in the case of steam turbines, which are usually bolted direct to the shafting of the generator. The power available to be applied mechanically is thus ascertained ; and the electrical power available is the sum of the capacities of motors driven by purchased electricity and of those driven by electricity generated in the same works. Comparison with power available in 1907 is not possible, since the capacity of electric motors in that year was not ascertained.

The calculation relating to power available has been made on the basis of the power equipment installed and not on that recorded as being in use. For reasons already given, it must be recognised that the figures representing power available per operative employed are, to some extent which cannot be determined from the data available in the Census office, in excess of the average power utilisable.

The following table sets out the results of the calculation :—

Power available in the several Timber Trades in 1924.

Trade.	Power for mechanical application.	Power for electrical application.	Total power.	Per head of average number of operatives employed.
	Th. H.P.	Th. H.P.	Th. H.P.	H.P.
Timber (Sawmilling, etc.)	83·3	83·0	166·3	3·0
Furniture, Cabinet-making and Upholstery	15·1	34·4	49·5	0·7
Wooden Crates, Cases, Boxes and Trunks	21·8	17·5	39·3	2·9
Carriage, Cart and Wagon ..	9·1	6·9	16·0	1·1
Brush-making	2·0	3·9	5·9	0·6
Coopering	1·9	3·3	5·2	1·2
Basket and Wicker-work	0·2	0·1	0·3	0·1
TOTAL	133·4	149·1	282·5	1·6

Fuel and Electricity in 1924.

All firms that received schedules were asked to furnish voluntarily particulars of their consumption of fuel (of specified kinds) and electricity (distinguishing that purchased from that generated in the works) under two headings, namely (i) for power (driving engines), and (ii) for heating or lighting the premises, and for manufacturing processes, etc. Firms whose aggregate net output was 61·7 per cent. of the net output of all firms in the Timber Trades in 1924 furnished information in response to this request, though, as will appear later, many of them were unable to divide their particulars into the two categories indicated. Moreover, the information returned was not equally representative of fuel consumption, of production of electricity, and of consumption of purchased electricity, as the data supplied under these three headings respectively covered 59·9 per cent. of the capacity of all the prime movers (not hydraulic) in use in the group, 53·5 per cent. of the capacity (in use) of the electric generators, and 50·6 per cent. of that of the electric motors driven by purchased electricity. The proportion of the trade for which particulars were furnished also varied between one trade and another, as will be seen from the tables given below.

Fuel consumption.

The following table summarises the information which was received from firms regarding the quantities of different kinds of fuel that they consumed in 1924. These quantities are divided into (*a*) the amounts used for power purposes, i.e., driving engines, and (*b*) the amounts used for the lighting or heating of premises, for manufacturing processes, etc., so far as the particulars furnished enable the classification to be made. It appears from the returns, however, that the basis of classification adopted by the various

firms that furnished information was by no means uniform ; and, apart from this, considerable quantities were reported for which no particulars of purpose could be assigned. These quantities are shown under heading (*c*) in the table.

Consumption of fuel (so far as reported) in the several Timber Trades in 1924.

NOTES.—(1) The figures in italics below the name of the trade represent respectively (*1*) the percentage of the total net output of the trade represented by the firms giving information, and (*2*) the percentage of the total capacity of prime movers (not hydraulic) in use in the trade represented by the firms giving information.

(2) The fuel consumed is, in each case, classified according to the purpose for which it was used, as follows :—(*a*) for power (driving engines) ; (*b*) for heating and lighting premises and for manufacturing processes ; (*c*) for purposes not separately distinguished.

Trade.		Coal and slack.	Coke and breeze.	Heavy oils.	Light oils.	Gas purchased.*
		Th. tons	Th. tons	Th. galls.	Th. galls.	Th. therms
Timber (Sawmilling, etc.) ..	(*a*)	69·0	1·4	60·9	81·4	409·5
(1) 97·9 ; (2) 67·9	(*b*)	8·2	1·4	8·3	416·2	421·0
	(*c*)	70·6	0·6	0·4	27·1	294·2
Furniture, Cabinet-making and Upholstery	(*a*)	15·3	3·5	10·7	16·4	439·7
(1) 41·5 ; (2) 53·3	(*b*)	8·8	6·0	3·0	252·7	1,296·1
	(*c*)	0·3	0·3	0·1	14·1	100·0
Wooden Crates, Cases, Boxes and Trunks	(*a*)	11·9	1·3	12·7	2·1	191·9
(1) 61·8 ; (2) 40·8	(*b*)	0·5	0·6	1·6	115·7	76·8
	(*c*)	0·1	—	0·7	10·3	104·9
Carriage, Cart and Wagon ..	(*a*)	2·1	0·3	1·6	18·1	86·5
(1) 41·7 ; (2) 49·8	(*b*)	3·3	4·5	6·5	28·3	89·0
	(*c*)	0·1	0·1	2·3	10·1	38·3
Brush-making	(*a*)	1·8	0·1	0·3	1·5	44·9
(1) 48·6 ; (2) 43·0	(*b*)	0·8	0·7	0·4	24·4	91·9
	(*c*)	0·7	†	—	—	2·3
Coopering	(*a*)	3·4	—	2·9	—	32·7
(1) 47·3 ; (2) 60·9	(*b*)	0·7	0·1	0·3	22·8	70·2
	(*c*)	—	—	—	0·4	3·3
Basket and Wicker-work ..	(*a*)	—	—	1·9	3·0	7·5
(1) 42·1 ; (2) 80·5	(*b*)	0·6	0·2	‡	7·9	18·3
	(*c*)	—	—	—	—	§
ALL TRADES	(*a*)	103·5	6·6	91·0	122·5	1,212·7
(1) 61·7 ; (2) 59·9	(*b*)	22·9	13·5	20·1	868·0	2,063·3
	(*c*)	71·8	1·0	3·5	62·0	543·0
GRAND TOTAL (ALL PURPOSES) ..		198·2	21·1	114·6	1,052·5	3,819·0

* The amount of gas purchased was, in some cases, returned in terms of cubic feet ; in such cases 200 cubic feet have been taken as equivalent to 1 therm.

† Less than 50 tons. ‡ Less than 50 gallons. § Less than 50 therms.

The difficulty of drawing conclusions and making generalisations on the basis of the figures shown in the preceding table is due primarily to the quantities of fuel consumed for which no particulars of purpose could be specified by firms that furnished information. The following table shows these quantities as percentages of the total of each class of fuel consumed in certain of the trades in the Timber group and for the group as a whole.

Proportion of fuel consumption for purposes not defined.

Trade.	Coal and slack.	Coke and breeze.	Heavy oils.	Light oils.	Gas purchased.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Timber (Sawmilling, etc.)	47·7	17·4	0·5	5·2	26·2
Furniture, Cabinet-making and Upholstery	1·1	2·6	0·6	5·0	5·4
Wooden Crates, Cases, Boxes and Trunks	1·0	—	4·9	8·0	28·1
Carriage, Cart and Wagon ..	1·8	3·1	21·9	17·8	17·9
Brush-making	21·5	0·1	—	—	1·6
ALL TRADES	36·2	4·7	3·0	5·9	14·2

Where the quantities of fuel consumed for purposes not distinguished form only small percentages of the total quantities reported, it may involve no great error to distribute them, e.g., in the proportions recorded for the purposes for which consumption was specified; but where the undistributed portion is important in proportion to the total consumption such a process might lead to erroneous conclusions.

Any attempt to extend the particulars furnished so as to estimate the quantities of different kinds of fuel used by all the firms in each of the Timber Trades would encounter other difficulties, even if distinction of purpose be ignored and attention be confined to the fuel used for all purposes combined. The table on page 91 shows that the firms that furnished information represented varying proportions of the several trades, and only in two trades was the proportion, as measured by net output, over 50 per cent. Any assumption that the firms that did not furnish information distributed their consumption among the different kinds of fuel in the proportions represented by the practice of those firms that supplied particulars would thus be extremely hazardous in the absence of information regarding the general practice of the several trades.

For the foregoing reasons, therefore, the information given in the table referred to should not be used as being of more than face value without extreme caution.

Production and consumption of electricity.

For 1907 the Census returns showed that about 1,547,000 units of electricity were generated in establishments with dynamos of 2,091 kilowatt capacity, equivalent to 35 per cent. of the total capacity of 5,921 kilowatts in the Timber Trades as a whole. In 1924, firms with generators (in use) of 6,600 kilowatt capacity (53·5 per cent. of the group total) recorded an aggregate of 6,981,000 units of electricity generated and consumed in their

works. As regards purchased electricity, a return was obtained from all firms at the 1907 Census, and this showed a total of over 7,760,000 units purchased for all purposes. In 1924 the information received showed that about 25,500,000 units were purchased by firms owning 50·6 per cent. of the electric motors (in use) driven by purchased electricity. While the figures form an inadequate basis for general estimates covering the entire group at both dates, they show clearly that a very large increase in the use of electrical energy took place in these trades, and appear also to be in harmony with the conclusion indicated on page 86 as to the tendency to rely more largely on electricity purchased from public supply undertakings than on the installation of generating plant in the works themselves.

The table on page 94 summarises the detailed information received from firms in the Timber group of trades as to the generation and consumption of electricity in 1924. The figures must, however, be regarded as subject to qualifications similar to those which apply to the particulars given on pages 90 to 92 respecting consumption of fuel; and, for the same reason, they cannot be appropriately used as the basis of generalised deductions. The following table shows, for certain of the Timber Trades and for the group as a whole, the percentages of the reported consumption of electricity for which no particulars of purpose could be given :—

Proportion of consumption of electricity for purposes not defined.

Trade.	Electricity.	
	Purchased.	Generated in own works.
	Per cent.	Per cent.
Timber (Sawmilling, etc).	23·1	39·6
Furniture, Cabinet-making and Upholstery ..	8·8	0·2
Wooden Crates, Cases, Boxes and Trunks ..	21·4	47·0
Carriage, Cart and Wagon	13·4	—
Brush-making	6·0	25·0
ALL TRADES	17·8	24·0

The particulars representing the average amount of electricity generated per kilowatt capacity, as shown in column (3) of the following table, exhibit a wide range of variation. These variations doubtless correspond to some extent with differences in the continuity with which the electric generators were operated in the works of the firms that furnished information. The difficulty of basing general conclusions regarding the several trades as a whole on the data shown in the table applies not less to this particular aspect of the matter than to the others.

Consumption of electricity (so far as reported) in the several Timber Trades.

NOTES.—(1) The figures in italics below the name of the trade represent respectively (*1*) the percentage of the total capacity of electric generators in use in the trade represented by the firms which stated the quantity of electricity generated in their works; and (*2*) the percentage of the total capacity of electric motors, driven by purchased electricity, in use in the trade represented by the firms which stated the quantity of electricity purchased by them.

(2) The electricity generated and the electricity purchased are, in each case, classified according to the purpose for which they were used, as follows :—(*a*) for power (driving engines); (*b*) for heating and lighting premises and for manufacturing processes, etc.; (*c*) for purposes not separately distinguished.

Trade.	Electricity generated in works of firms giving information.				Electricity purchased by firms giving information.	
	Capacity of electric generators (in use). (1)	Quantity of electricity generated. (2)	Average per kilowatt capacity of generators. (3)	Capacity of electric motors (in use) driven thereby. (4)	Quantity of electricity purchased. (5)	Capacity of electric motors (in use) driven thereby. (6)
	Th. Kw.	Th. B.T. Units.	B.T. Units.	Th. H.P.	Th. B.T. Units.	Th. H.P.
Timber (Sawmilling, etc.) .. .. *(1) 50·5; (2) 52·3*	3·6	(*a*) 1,649·3 (*b*) 55·2 (*c*) 1,118·4	783·1	8·3	(*a*) 8,969·7 (*b*) 601·8 (*c*) 2,872·7	34·7
Furniture, Cabinet-making and Upholstery .. *(1) 70·8; (2) 44·6*	2·1	(*a*) 2,356·7 (*b*) 322·7 (*c*) 5·8	1,271·4	2·8	(*a*) 5,432·7 (*b*) 966·0 (*c*) 613·6	13·1
Wooden Crates, Cases, Boxes and Trunks .. *(1) 39·2; (2) 61·8*	0·5	(*a*) 471·2 (*b*) 10·0 (*c*) 427·0	1,936·5	1·1	(*a*) 2,938·2 (*b*) 158·5 (*c*) 844·0	8·5
Carriage, Cart and Wagon. *(1) 15·2; (2) 47·7*	*	(*a*) 7·4 (*b*) 4·1 (*c*) —	425·4	0·1	(*a*) 810·1 (*b*) 174·3 (*c*) 152·0	3·0
Brush-making .. *(1) 37·5; (2) 41·4*	0·4	(*a*) 297·4 (*b*) 71·3 (*c*) 123·2	1,340·2	0·9	(*a*) 463·5 (*b*) 48·7 (*c*) 32·8	0·8
Coopering .. *(1) 60·2; (2) 32·4*	*	(*a*) 55·2 (*b*) 3·9 (*c*) —	1,182·9	0·1	(*a*) 309·1 (*b*) 26·6 (*c*) 29·1	0·9
Basket and Wicker-Work .. .. *(1) 44·4; (2) 90·4*	*	(*a*) — (*b*) 2·2 (*c*) —	270·0	†	(*a*) 20·9 (*b*) 13·6 (*c*) —	0·1
ALL TRADES .. *(1) 53·5; (2) 50·6*	6·6	(*a*) 4,837·2 (*b*) 469·4 (*c*) 1,674·4	1,051·7	13·3	(*a*) 18,944·2 (*b*) 1,989·5 (*c*) 4,544·2	61·1

* Less than 50 kw. † Less than 50 H.P.