

## THE IRON AND STEEL TRADE (BLAST FURNACES AND SMELTING AND ROLLING)

*Note.*—For information regarding the scope of the Census, instructions given to firms for making returns, and definitions of the terms used in this report, reference should be made to the Introductory Notes on pages v to xviii.

### Introductory

This report relates to the heavy iron and steel trades, i.e. the manufacture of crude iron and steel and the conversion of these into certain semi-finished forms. At both Censuses the production of pig iron was dealt with as a distinct trade, a separate return being required in the frequent cases in which a blast furnace was combined with a steel works in a single plant. This segregation was found to be practicable in respect of all the heads of information included in the Census schedule except power capacity, which in the larger plants is frequently provided by a central power unit supplying the requirements of the undertaking as a whole.

Separate reports are accordingly made for blast furnaces and for the remainder of the heavy iron and steel trades, but for the purposes of power equipment and the consumption of fuel the two sections are treated together (see page 47).

At the 1924 Census, the schedule issued to steel works also covered the production of heavy iron castings, but all returns relating mainly to the founding of iron were classified separately for the year 1930 (see report on Iron and Steel Foundries, page 61). In order to maintain comparability with the results for 1924, the returns for that year have been re-classified, and the results now given for the two years in the various reports affected by this change are believed to cover substantially the same ground. The necessary adjustments have involved considerable amendments to previous aggregates for 1924, and the particulars contained in the present series of reports should be regarded as substituting those published in the Final Report on the Third Census of Production (1924) in respect of the Iron and Steel (Smelting, Rolling and Founding) Trades.



## BLAST FURNACES

The following table shows the main results of the Censuses of 1930 and 1924 in respect of all blast furnaces in Great Britain:—

Particulars	Unit	1930	1924
Value of products (Gross output) ... ..	£'000	23,820	36,572
Cost of materials used ... ..	"	19,872	31,315
Net output ... ..	"	3,948	5,257
Average number of persons employed ... ..	No.	19,362	26,970
Net output per person employed ... ..	£	204	195
Number of returns ... ..	No.	68	92
Number of establishments ... ..	"	69	*

\* Not available.

**Size of firms.**—In the following table the main particulars recorded at the Census of 1930 are grouped according to the average numbers of persons shown in the returns:—

Size of firm (average numbers employed)	Number of returns	Gross output	Net output	Average number of persons employed	Net output per person employed
	No.	£'000	£'000	No.	£
11-99 ... ..	12	756	220	700	314
100-199 ... ..	19	3,849	517	2,750	188
200-299 ... ..	10	2,599	468	2,400	194
300-399 ... ..	12	5,154	665	4,161	160
400-499 ... ..	6	3,735	549	2,670	206
500 and over ... ..	9	7,727	1,529	6,681	229
TOTAL ... ..	68	23,820	3,948	19,362	204

**Regional distribution.**—In the following table the results recorded at the Censuses of 1930 and 1924 are grouped according to the principal areas\* of Great Britain in which blast furnaces are situated:—

Area	Number of returns	Gross output	Net output	Average number of persons employed	Net output per person employed	
	No.	£'000	£'000	No.	£	
2 ...	1930	8	2,228	430	1,660	259
	1924	11	4,741	775	2,912	266
3 ...	1930	6	1,401	280	1,369	204
	1924	6	3,194	544	2,571	212
4 ...	1930	13	6,241	855	4,253	201
	1924	16	8,664	1,131	7,544	150
5 ...	1930	8	1,377	244	1,383	176
	1924	16	3,383	478	2,182	219

\* For particulars see page xviii.

Area	Number of returns	Gross output	Net output	Average number of persons employed	Net output per person employed	
	No.	£'000	£'000	No.	£	
6 ...	1930	20	8,333	1,653	7,351	225
	1924	22	8,199	1,306	6,473	202
7 ...	1930	5	2,102	255	1,321	193
7 and 8 ...	1924	8	5,043	751	2,753	273
9 and 10	1930	8	2,138	231	2,025	114
	1924	13	3,348	272	2,535	107
TOTAL	1930	68	23,820	3,948	19,362	204
	1924	92	36,572	5,257	26,970	195

**Northern Ireland.**—No production was recorded in Northern Ireland either in 1930 or in 1924.

## Production

**Principal products.**—The following table shows the value and quantity of pig iron and ferro-alloys made in 1930 and 1924. The particulars shown for each year are inclusive of an output of "Other ferro-alloys" returned on schedules for other trades, the amounts so included being 1,500 tons, valued at £509,000 (2 entries) for 1930, and 700 tons, valued at £203,000 for 1924. The figures collected by the National Federation of Iron and Steel Manufacturers and published in *Statistics of the Iron and Steel Industries (1931)* are included for purposes of comparison.

Kind of goods	1930			1924		
	Census of Production		Federa- tion	Census of Production		
	Quantity	Value	Ent- ries	Quantity	Quantity	Value
	Th. tons	£'000	No.	Th. tons	Th. tons	£'000
Pig iron:—						
Forge ... ..	285.9	986	29	282.5	2,417.6	10,979
Foundry ... ..	1,560.5	5,195	38	1,433.7		
Acid (hematite) ... ..	1,826.2	6,655	21	1,841.0	2,090.1	9,770
Basic ... ..	2,448.4	7,895	30	2,407.6	2,651.5	11,810
Other qualities ... ..	Included	above		94.4	Included	above
TOTAL—Pig iron ... ..	6,121.0	20,731	...	6,059.2	7,159.2	32,559
Ferro-alloys:—						
Spiegeleisen ... ..	34.9	192	5	30.5	196.6	2,531
Ferro-manganese ... ..	90.8	970	7	99.3		
TOTAL—Spiegeleisen and ferro-manganese	125.7	1,162	...	129.8	196.6	2,531
Ferro-silicon ... ..	4.9	530	6	2.2	4.8	238
Other alloys ... ..				1.2*		
TOTAL—Ferro-alloys...	130.6	1,692	...	133.2	201.4	2,769
TOTAL—PRINCIPAL PRODUCTS ... ..	6,251.6	22,423	...	6,192.4	7,360.6	35,328

\* Silico-manganese.



The particulars of quantity which the Board of Trade could require were limited to those classes of pig iron separately specified in the Import and Export List, no provision being made for "other qualities" included in the returns to the Federation. The bulk, if not the whole, of these "other qualities" was probably returned at the Census as foundry iron, there being substantial agreement between the Census figures and those of the Federation in regard to the other descriptions of iron, when it is borne in mind that the latter relate to the calendar year while firms that made returns to the Census were allowed to give particulars relating to their business year, if this was more convenient. In the aggregate the Federation's figures for pig iron and ferro-alloys are 0.9 per cent. less than the Census figures. In this connection it may be mentioned that the recorded production of pig iron in the month of December, 1930, was 349,800 tons as compared with 643,000 tons in December, 1929.

A large proportion of the output of blast furnaces is used in steel works under the same ownership, and the value assigned to the pig iron output in such cases was the amount charged against the steel works. This amount was not necessarily the same as that charged for similar pig iron sold to other firms and the figures of value shown in the above table, particularly as regards the acid and basic descriptions, may thus fall short to some extent of the selling values. The figures of net output and net output per person for this trade may also be somewhat understated in relation to those for trades the output of which was valued on the basis of the amounts charged to customers.

**Prices.**—The average selling values of each class of pig iron and ferro-alloy in 1930 and 1924, as calculated from the Census returns, are shown in the following table. It should be borne in mind that these comparisons do not take account of any changes that may have occurred since the earlier year in the quality or type of goods included under the specified descriptions.

Kind of goods	Average value		1930 as a percentage of 1924
	1930	1924	
	£ per ton	£ per ton	Per cent.
<b>Pig iron :—</b>			
Forge ... ..	3.45	3.35	73.8
Foundry ... ..	3.33		
Acid (hematite) ... ..	3.64	4.67	77.9
Basic ... ..	3.22	4.45	72.4
<b>Ferro-alloys :—</b>			
Spiegeleisen ... ..	5.51	9.24	71.8
Ferro-manganese ... ..	10.67		
Ferro-silicon and other ferro-alloys ...	108.09	49.67	217.6

**Volume of production in 1930 and 1924.**—The following table compares the volume of production of pig iron and ferro-alloys in 1930 and 1924 :—

Kind of goods	Total production			1930 as a percentage of 1924
	1930	1924		
	As returned	As returned	At 1930 average values	Per cent.
	£'000	£'000	£'000	
<b>Pig iron :—</b>				
Forge and foundry ... ..	6,181	10,979	8,103	76
Acid (hematite) ... ..	6,655	9,770	7,611	87
Basic ... ..	7,895	11,810	8,550	92
<b>Ferro-alloys :—</b>				
Spiegeleisen and ferro-manganese	1,162	2,531	1,817	64
Ferro-silicon and other ferro-alloys ... ..	530	238	518	102
<b>TOTAL ... ..</b>	<b>22,423</b>	<b>35,328</b>	<b>26,599</b>	<b>84</b>

**Production, exports and imports.**—The following table shows, in relation to production, the quantities of pig iron and ferro-alloys exported from the United Kingdom in 1930 and 1924, together with the quantities imported and retained :—

Kind of goods	Production	Exports	Proportion of production exported	Retained imports	Available for use in the United Kingdom	Share of home market held by British products
						Per cent.
	Th. tons	Th. tons	Per cent.	Th. tons	Th. tons	Per cent.
<b>Pig iron :—</b>						
Forge ... .. 1930	285.9	5.1	1.8	1.1	281.9	99.6
Foundry ... .. 1930	1,560.5	138.4	8.9	117.5	1,539.6	92.4
<b>Total—Forge and foundry</b> { 1930	<b>1,846.4</b>	<b>143.5</b>	<b>7.8</b>	<b>118.6</b>	<b>1,821.5</b>	<b>93.5</b>
{ 1924	<b>2,417.6</b>	<b>282.5</b>	<b>11.7</b>	<b>114.6</b>	<b>2,249.7</b>	<b>94.9</b>
Acid (hematite) { 1930	1,826.2	126.9	6.9	0.2	1,699.5	99.9
{ 1924	2,090.1	195.2	9.3	2.3	1,897.2	99.8
Basic ... .. { 1930	2,448.4	0.8	0.03	171.7	2,619.3	93.4
{ 1924	2,651.5	7.5	0.3	170.3	2,814.3	93.9
<b>Ferro-alloys :—</b>						
Spiegeleisen and ferro-manganese ... .. { 1930	125.7	45.0	35.8	5.5	86.2	93.6
{ 1924	196.6	113.4	57.7	1.3	84.5	93.5
Other ferro-alloys ... .. { 1930	4.9	1.0	19.6	16.1	20.0	19.5
{ 1924	4.8	1.3	27.4	18.5	22.0	15.9

**Other products.**—In addition to the output shown in the table of principal products on page 29, the following goods were returned for 1930 and 1924 on schedules for Blast Furnaces. These goods are dealt with in the reports on those trades in which the principal output was recorded.



Kind of goods	1930		1924	
	Quantity	Value	Quantity	Value
Iron castings in the rough ...	Th. tons 17.6	£'000 85	Th. tons 3.4	£'000 20
Ground slag ... ..	517.7	161	} 743.4	300
Cement, crushed stone, clinker and other building and paving materials ... ..	...	74		
Tarred macadam ... ..	489.3	298	369.5	336
Electricity sold ... ..	Mill. units† 321.2	633	Mill. units† 96.1	300
Gas sold ... ..	...	461	...	216
Waste heat (steam) and water sold‡	...	10	*	*
TOTAL ... ..	...	1,722	...	1,172

\* Not separately recorded.

† i.e., Board of Trade units (Kilowatt-hours).

‡ So far as recorded.

**Waste products sold.**—The following sales of waste products were recorded on schedules for Blast Furnaces in 1930 and 1924:—

	1930	1924
	£'000	£'000
Slag, not ground ... ..	144	} 259
Cinder, etc. ... ..	40	
Other waste and by-products ... ..	—	16
TOTAL ... ..	184	275

### Employment and Wages

**Employment.**—The following table shows the average numbers of persons employed in 1930 and 1924:—

Persons employed	Males		Females		Total	
	Under 18	All ages	Under 18	All ages	Under 18	All ages
1930						
Operatives (average for the year)	416	18,015	6	68	422	18,083
Administrative, technical and clerical staff (as at 18th October) ... ..	80	1,141	24	138	104	1,279
TOTAL ... ..	496	19,156	30	206	526	19,362
1924						
Operatives (average for the year)	496	25,233	8	92	504	25,325✓
Administrative, technical and clerical staff (as at 18th October) ... ..	118	1,487	11	158	129	1,645
TOTAL ... ..	614	26,720	19	250	633	26,970

**Wages.**—The available information as to the amount of wages paid in 1930 and 1924 is given on pages 18 and 19.

### IRON AND STEEL (SMELTING AND ROLLING)

This trade comprises private establishments that were engaged wholly or mainly in the smelting, rolling and casting of steel and in the manufacture of puddled and wrought iron. Establishments owned by railway companies and other public utility undertakings are dealt with in a separate volume.

The following table shows the main results of the Censuses of 1930 and 1924 in respect of firms in Great Britain that employed an average of more than ten persons:—

Particulars	Unit	1930	1924
Value of goods made and work done (Gross output)	£'000	84,366	121,745
Cost of materials used .....	..	58,206	89,160
Paid for work given out to other firms ... ..	..	583	504
Net output ... ..	..	25,577	32,081
Average number of persons employed ... ..	No.	136,417	157,947
Net output per person employed ... ..	£	187	203
Number of returns ... ..	No.	303	345
Number of establishments ... ..	..	343	*

\* Not available.

**Deficiencies in 1930 aggregates.**—The aggregate number of persons employed in 1930 by firms that stated that they employed not more than ten persons on the average was 132. At the 1924 Census, a total of 138 employees was recorded by firms of this class, the value of their gross output being £105,000. The effect of the exclusion of small firms was therefore negligible in this trade.

No information was received from 27 firms at the 1930 Census and from 22 at that of 1924. These firms either had small businesses or had ceased productive operations before the end of the censal year.

**Size of firms.**—In the following table the main particulars recorded at the Census of 1930 are grouped according to the average numbers of persons shown in the returns:—

Size of firm (average numbers employed)	Number of returns	Gross output	Net output	Average number of persons employed	Net output per person employed
	No.	£'000	£'000	No.	£
11-24 ...	33	381	138	588	235
25-49 ...	34	749	262	1,237	212
50-99 ...	39	1,575	521	2,839	184
100-199 ...	57	5,532	1,784	8,252	216
200-299 ...	25	3,802	1,090	6,105	178
300-399 ...	21	3,808	1,358	6,904	197
400-499 ...	16	5,956	1,447	7,197	201
500-749 ...	25	10,477	2,885	15,277	189
750-999 ...	14	9,571	2,309	12,205	189
1,000-1,499 ...	20	16,136	4,842	25,222	192
1,500 and over ...	19	26,379	8,941	50,591	177
TOTAL ...	303	84,366	25,577	136,417	187



The table shows that more than one-half of the total number of employees, and about the same proportion of the total net output, were recorded on returns relating to establishments at which 1,000 or more persons were employed. A number of large scale concerns owning steel works and rolling mills furnished more than one return and the figures shown for the higher ranges in the table do not therefore fully express the position as regards *firms* of the sizes indicated. The heavy Iron and Steel Trade contains many combinations which operate steel works in association with blast furnaces, coke ovens, collieries and other productive industries, and returns were made by these concerns in respect of each of the industries in which they were engaged. The qualifications referred to in paragraph 2 of the Introductory Notes regarding the relationship between the number of firms and the number of returns received are, therefore, of special importance in the case of this trade.

**Regional distribution.**—In the following table the results recorded at the Censuses of 1930 and 1924 are grouped according to the principal areas\* of Great Britain in which firms in this trade are situated:—

Area	Number of returns	Gross output	Net output	Average number of persons employed	Net output per person employed
	No.	£'000	£'000	No.	£
2 ...	1930 20	8,177	2,413	13,043	185
	1924 27	9,960	2,662	12,217	218
3 ...	1930 114	19,972	8,151	42,060	194
	1924 108	21,376	8,295	40,164	207
4 ...	1930 29	14,269	3,978	21,966	181
	1924 27	17,525	3,552	20,944	170
5 ...	1930 57	9,137	2,546	14,815	172
	1924 91	15,825	3,868	22,890	169
1 and 6 ...	1930 15	6,653	1,476	7,843	190
	1924 19	9,614	1,914	9,455	202
7 and 8	1930 39	14,751	3,595	18,748	188
	1924 45	31,793	7,737	30,004	258
9 and 10	1930 29	11,407	3,418	17,942	191
	1924 28	15,652	4,053	22,273	182
TOTAL	1930 303	84,366	25,577	136,417	187
	1924 345	121,745	32,081	157,947	203

**Northern Ireland.**—No production of the goods to which this trade relates was recorded for Northern Ireland in 1930 or in 1924.

\* For particulars see page xviii.

**Sub-divisions of the industry.**—The following table shows the results of grouping the returns for the 1930 Census according to the principal processes carried on at the establishments to which they related. As will be seen, nearly 60 per cent. of the total net output of the trade, and about the same proportion of the total number of employees, was recorded on returns for the steel smelting group, which in many cases included departments engaged in the other processes mentioned.

Group	Number of returns	Gross output	Net output	Average number of persons employed	Net output per person employed
	No.	£'000	£'000	No.	£
Steel smelting... ..	61	50,980	14,741	80,570	183
Manufacture of special steel... ..	35	3,718	1,802	7,249	249
Manufacture of rolled products... ..	88	14,626	3,933	21,164	186
Manufacture of galvanised sheets... ..	27	7,828	2,135	11,141	191
Manufacture of wrought iron... ..	29	4,317	1,501	9,490	159
Other processes... ..	63	2,895	1,465	6,803	215
TOTAL... ..	303	84,366	25,577	136,417	187

### Production

**Total make of steel and semi-finished products.**—*Steel ingots and castings.*—The total quantities of steel ingots and castings produced in 1930 and 1924, as recorded at the Censuses for those years, are shown below, the figures being inclusive in each case of the amounts used in the makers' works for further manufacture. Manufacturers were asked to classify their output of special steel in both years under the two headings, *electric* and *crucible*, the limitations imposed by the Census of Production Act, 1906, not enabling this information to be obtained compulsorily. As will be seen from the following figures, a considerable proportion of the output of steel recorded for 1924 was not distributed by kinds and the figures given in respect of individual headings for the two years may not, therefore, be precisely comparable.



Total make	1930				1924	
	Returned on schedules for					
	The Iron and Steel (Smelting and Rolling) Trade		All trades			Total
	Quantity	Entries	Quantity	Entries		
Th. tons	Number	Th. tons	Number	Th. tons		
Steel ingots, other than of special steel ... ..	6,882.4	65	6,882.4	65	7,055.2	
Ingots of special steel:—						
Electric ... ..	45.3	17	45.5	18	31.5†	
Crucible ... ..	8.0	34	13.2	47	10.9†	
Other (including electric and crucible, not separately distinguished)† ... ..	2.3	5	2.6	6	—	
TOTAL—Special steel ...	55.6	...	61.3	...	42.4†	
Steel castings ... ..	67.6	38	100.3‡	83	*	
Steel not separately distinguished ... ..	—	—	—	—	869.2	
TOTAL—STEEL ... ..	7,005.6	...	7,044.0	...	7,966.8	

† So far as recorded separately.

‡ Of this amount 19,500 tons were returned as "sold or added to stock" by firms that made their returns on schedules for trades in which "total make" was not required.

\* Included under other heads.

Apart from this trade and the Tool and Implement, Cutlery, and Mechanical Engineering Trades the requirement to state their total production of steel was not extended to firms or to public utility undertakings (e.g., railway companies) that may have produced steel for their own uses. According to the returns published by the National Federation of Iron and Steel Manufacturers\*, the total quantity of steel produced in the calendar year 1930 was 7,325,700 tons, a figure about 4 per cent. greater than the Census total for the same year. The principal items included in the total reported by the Federation were the following:—

	Th. tons
Steel ingots:	
Open hearth ... ..	6,852.1
Converter ... ..	255.3
Electric:	
Ingots ... ..	40.4
Castings ... ..	35.6
All other steel ingots and castings ... ..	142.3
TOTAL ... ..	7,325.7

The difference in the two aggregates is due partly to the fact that a considerable number of the Census returns related to periods of twelve months other than the calendar year, and partly to the fact that returns of production of steel were received by the Federation

\* Statistics of the Iron and Steel Industries (1931).

from all makers without exception. It is also probable that, for a large proportion of the output of steel castings, the weight recorded in the Census returns was as finished for delivery, this being substantially lower than that of the steel used in their production.

*Other semi-finished iron and steel.*—Particulars of the total production of certain other important classes of semi-finished iron and steel products that may be used for further manufacture in makers' works are given below:—

Total make	1930				1924	
	Returned on schedules for					
	The Iron and Steel (Smelting and Rolling) Trade		All trades			Total
	Quantity	Entries	Quantity	Entries		
Th. tons	Number	Th. tons	Number	Th. tons		
Steel blooms, billets and slabs ...	3,664.7	53	3,669.8	54	4,287.1*	
Sheet bars ... ..	744.7	27	744.8	28	935.1	
Timplate bars ... ..	919.5	17	919.5	17	1,222.9	
Wire rods ... ..	157.3	13	217.3†	19	189.1†	
Steel girders, beams, joists and pillars ... ..	356.8	14	359.4	16	417.0	
Bright steel bars ... ..	68.9	19	77.2	24	1,371.8	
Steel bars, rods, angles, shapes and sections, not elsewhere specified	1,535.2	118	1,540.3	121	362.6	
Puddled bars ... ..	110.3	25	110.3	25		
Scrap bars ... ..	158.6	30	158.6	30		
Iron bars, rods, angles, shapes and sections, not elsewhere specified	163.9	39	163.9	39		
Hoop, baling and barrel:—						
Iron ... ..	1.4	6	1.4	6	100.9	
Steel ... ..	55.0	15	55.0	15		
Hoop and strip for tubes:—						
Iron ... ..	51.5	12	51.5	12	255.2	
Steel ... ..	158.3	16	160.2	18		
Hoop, baling and barrel, and hoop and strip for tubes, not separately distinguished ... ..	28.6	1	28.6	1	89.7	
Hoop and strip for other purposes	90.8	32	100.7	36		
Plates and sheets, not galvanised, not tinned, etc.:—						
Iron plates and sheets not under ½ inch thick ... ..	1.9	5	1.9	5	10.3	
Iron plates and sheets under ½ inch thick ... ..	1.8	6	1.8	6		
Steel plates and sheets not under ½ inch thick (including armour plates) ... ..	1,078.7	47	1,081.6	49	1,130.2	
Black sheets under ½ inch thick (over 54 ins. by 28 ins.) ...	819.9	38	856.9	47	1,020.4	
Black plates under ½ inch thick (up to 54 ins. by 28 ins.) ...	77.6	21	798.5	81	821.7	

\* Including iron blooms, billets, etc., in 1924.

† Including, for the Wire Trade, the total production in 1930 but only the amount returned as sold or added to stock in 1924. Wire drawing firms were not required to state their total production of wire rods for 1924.



The figures shown above for *Black sheets under ½ in. thick* include sheets galvanised or tinned by the makers and therefore differ from those reported by the National Federation of Iron and Steel Manufacturers, which do not include the quantities so used. Excluding this item, an aggregate of 10,386,900 tons was reported by the Federation as the total output in 1930 of the products falling under the descriptions shown in the table, the Census aggregate for these products being 10,243,800 tons. For the individual classes of goods, the two sets of returns are in reasonably close agreement when allowance is made for possible differences between the periods covered by the returns and for the somewhat wider range of the Federation's survey.

**Goods sold or added to stock.**—The following table shows the value and, where available, the quantity of the principal products of the Iron and Steel (Smelting and Rolling) Trade made in 1930 and 1924 and sold or added to stock. At the 1930 Census the headings for steel ingots were (a) steel ingots, other than electric and crucible steel, and (b) ingots of special steel (i) electric and (ii) crucible, but a certain amount of special steel of other descriptions was separately returned, and the average value of such descriptions of steel was about eight times that of the electric and crucible steel. For 1924 all special steel was recorded under one heading, and it is probable that the total stated for 1924 included certain kinds of steel that were classified in 1930 as steel ingots, or as blooms, billets and slabs, or bars, rods, etc.

Kind of goods	1930						1924	
	Returned on schedules for						Total	
	The Iron and Steel (Smelting and Rolling) Trade			All trades				
	Quantity	Value	Ent-ries	Quantity	Value	Ent-ries	Quantity	Value
Th. tons	£'000	No.	Th. tons	£'000	No.	Th. tons	£'000	
Steel ingots, other than of special steel ...	395.0	1,941	35	395.0	1,941	35	330.1	2,181
Ingots of special steel:—								
Electric ...	17.9	373	5	17.9	373	5		
Crucible ...	2.8	247	18	4.5	355	28		
Other (including electric and crucible, not separately distinguished) ...	1.0	149	4	1.3	155	5	81.0	2,975
Refined pig iron	16.7	96	3	22.1	126	5	†	†
* ...	*	108	3	*	108	3		
Steel castings ...	57.7	2,245	34	82.3	3,086	77	114.0	4,645
Steel blooms, billets and slabs...	826.7	6,018	52	831.9	6,055	53	1,056.9†	9,049†
Sheet bars ...	458.0	2,606	26	458.1	2,607	27	679.2	5,351
Tinplate bars ...	910.8	5,323	17	910.8	5,323	17	1,222.8	9,968
Wire rods ...	151.3	1,355	13	164.8	1,478	17	183.6	2,316

Kind of goods	1930						1924	
	Returned on schedules for						Total	
	The Iron and Steel (Smelting and Rolling) Trade			All trades				
	Quantity	Value	Ent-ries	Quantity	Value	Ent-ries	Quantity	Value
Th. tons	£'000	No.	Th. tons	£'000	No.	Th. tons	£'000	
Steel girders, beams, joists and pillars ...	354.2	2,618	14	356.8	2,902	16	380.8	3,492
Bright steel bars	67.6	1,258	19	75.9	1,396	24		
Steel bars, rods, angles, shapes and sections not elsewhere specified ...	1,470.4	14,143	117	1,475.6	14,313	120	1,327.5	14,706
Puddled bars ...	3.5	25	8	3.5	25	8		
Scrap bars ...	3.6	20	14	3.6	20	14		
Iron bars, rods, angles, shapes and sections, not elsewhere specified ...	160.8	1,696	38	160.9	1,696	39	350.9	4,468
Hoop, baling and barrel:—								
Iron ...	1.4	16	6	1.4	16	6		
Steel ...	54.3	506	15	54.3	506	15	100.9	1,281
Hoop and strip for tubes:—								
Iron ...	50.8	587	11	50.8	587	11	255.2	2,978
Steel ...	157.8	1,259	15	157.8	1,259	15		
Hoop, baling and barrel, and hoop and strip for tubes, of iron and steel, not separately distinguished ...	28.4	246	1	28.4	246	1		
Hoop and strip for other purposes ...	87.8	1,387	32	97.8	1,571	36	89.2	1,419
Plates and sheets (except black plates), † not galvanised, not tinned, etc.:—								
Iron plates and sheets not under ½ inch thick ...	1.9	29	5	1.9	29	5		
Iron plates and sheets under ½ inch thick ...	1.4	26	5	1.4	26	5	10.3	183
Steel plates and sheets not under ½ inch thick (including armour plates) ...	1,075.6	9,554	47	1,078.5	9,592	49	1,100.4	12,868
Black sheets under ½ inch thick (over 64 ins. by 28 ins.) ...	453.7	5,134	36	480.8	5,479	43	686.9	10,433



Kind of goods	1930						1924	
	Returned on schedules for						Total	
	The Iron and Steel (Smelting and Rolling) Trade			All trades				
	Quantity	Value	Ent- ries	Quantity	Value	Ent- ries	Quantity	Value
Th. tons	£'000	No.	Th. tons	£'000	No.	Th. tons	£'000	
Galvanised sheets :—								
Flat ...	97.2	1,426	21	97.2	1,426	21	160.9	3,295
Corrugated ...	431.8	5,678	26	433.9	5,711	28	549.0	10,625
Railway, etc., material** :—								
Steel rails, new—								
Grooved for trams ...	32.0	303	5	32.0	303	5	70.3	666
Railway (including conductor rails for electric traction) ...	446.7	3,481	24	446.7	3,481	24	537.1	4,617
Sleepers and fishplates ...	79.3	709	19	82.8	745	23	88.2	944
Tyres and axles	77.7	1,623	17	98.1	2,061	24	122.8	2,910
Other railway, etc., material (including railway spikes) ...	70.0	1,171	24	175.2	2,199	88	154.7	2,300
Steel forgings, other than tyres, wheels and axles ...	54.0	2,253	33	63.7	2,617	115	120.9§	3,336
Other smelting and rolling products	31.7	1,274	...	33.4	1,311	...	...	450
Manufactures of iron and steel, not separately distinguished ...	—	—	—	—	—	—	...	4,135
<b>TOTAL—PRINCIPAL PRODUCTS:</b>								
Quantity stated ...	8,131.5	76,775	{ ... }	8,381.1	81,016	{ ... }	9,773.6	117,006
Quantity not stated ...	...	108	{ ... }	...	108	{ ... }	...	450

|| So far as separately recorded.

\* Quantity not stated.

† Not separately recorded.

‡ Including iron blooms, billets, etc., in 1924.

¶ For black plates see page 81.

§ Steel forgings in the rough.

\*\* Excluding sets of wheels and axles (see page 370), and goods produced by railway companies.

**Prices.**—The average selling values of the principal products of the Iron and Steel (Smelting and Rolling) Trade in 1930 and 1924, as calculated from the Census returns, are shown in the following table. It should be borne in mind that these comparisons do not take account of any changes that may have occurred since the earlier year in the quality or type of goods included under the specified descriptions.

Kind of goods	Average value		1930 as a percentage of 1924
	1930	1924	
	£ per ton	£ per ton	Per cent.
Steel ingots, other than of special steel...	4.9	6.6	74.4
Steel castings ...	37.0	40.7	90.9
Steel blooms, billets and slabs ...	7.3	8.6	85.3
Sheet bars ...	5.7	7.9	72.3
Tinplate bars ...	5.8	8.2	71.7
Wire rods ...	9.0	12.6	71.1
Steel girders, beams, joists and pillars ...	8.1	9.2	88.7
Steel bars, rods, angles, shapes and sections, not elsewhere specified (including bright steel bars) ...	10.3	11.1	92.8
Iron bars, rods, angles, shapes and sections (including puddled bars and scrap bars) ...	10.4	12.7	81.5
Hoop, baling and barrel ...	9.4	12.7	73.8
Hoop and strip for tubes ...	8.8	11.7	75.8
Plates and sheets, not galvanised, not tinned, etc. :—			
Iron plates and sheets not under ½ inch thick ...	14.9	16.3	92.1
Iron plates and sheets under ½ inch thick ...	18.2		
Steel plates and sheets not under ½ inch thick (including armour plates) ...	8.9	11.7	76.0
Black sheets under ½ inch thick (over 54 ins. by 28 ins.) ...	11.4	15.2	74.9
Galvanised sheets :—			
Flat ...	14.7	20.5	71.6
Corrugated ...	13.2	19.4	68.0
Railway material :—			
Steel rails, new—			
Grooved for trams ...	9.4	9.5	99.9
Railway (including conductor rails)	7.8	8.6	90.7
Sleepers and fishplates ...	9.0	10.7	83.7
Tyres and axles ...	21.0	23.7	88.7

**Volume of production in 1930 and 1924.**—The following table compares the volume of production in 1930 and 1924 of the classes of goods to which this report relates :—



Kind of goods	Total production			1930 as a percentage of 1924
	1930	1924		
	As returned	As returned	At 1930 average values	Per cent.
Steel ingots, other than of special steel	£'000 1,941	£'000 2,181	£'000 1,622	120†
Ingots of special steel ... ..	883	2,975	3,023	29†
Refined pig iron ... ..	234	*	*	—
Steel castings ... ..	3,086	4,645	4,224	73
Steel blooms, billets and slabs ...	6,055	9,049	7,715	78
Sheet bars ... ..	2,607	5,351	3,866	67
Tinplate bars ... ..	5,323	9,968	7,146	74
Wire rods ... ..	1,478	2,316	1,647	90
Steel girders, beams, joists and pillars ... ..	2,902	3,492	3,097	94
Bright steel bars ... ..	1,396	14,706	13,647	122
Steel bars, rods, angles, shapes and sections, not elsewhere specified	14,313			
Puddled bars ... ..	25	4,468	3,639	48
Scrap bars ... ..	20			
Iron bars, rods, angles, shapes and sections, not elsewhere specified	1,696	5,678	4,488	93
Hoop and strip ... ..	4,185			
Plates and sheets (except black plates)¶, not galvanised, not tinned, etc. :-				
Iron plates and sheets ... ..	55	183	169	33
Steel plates and sheets not under ½ inch thick (including armour plates) ... ..	9,592	12,868	9,775	98
Black sheets under ½ inch thick (over 54 ins. by 28 ins.) ...	5,479	10,433	7,814	70
Galvanised sheets :-				
Flat ... ..	1,426	3,295	2,359	60
Corrugated ... ..	5,711	10,625	7,224	79
Railway, etc., material‡ :-				
Steel rails, new—				
Grooved for trams ... ..	303	666	666	46
Railway (including conductor rails for electric traction) ...	3,481	4,617	4,185	83
Sleepers and fishplates ... ..	745	944	790	94
Tyres and axles ... ..	2,061	2,910	2,581	80
Other railway, etc., material ...	2,199	2,300	1,930	114
Steel forgings, other than tyres, wheels and axles ... ..	2,617	3,336§	4,971	53
Other smelting and rolling products	1,311	450	376	349
Structural work ... ..	911	925	772	118
Manufactures of iron and steel, not separately distinguished ...	—	4,135	3,414	—
TOTAL ... ..	82,035	122,516	101,140	81

† See page 38.

\* Not separately recorded.

¶ For black plates see page 82.

‡ Exclusive of sets of wheels and axles (see page 372), and of production by railway companies.

§ Steel forgings in the rough.

|| Based on average value of preceding items.

**Production, exports and imports.**—The following table shows, in relation to production, the quantities of the principal classes of smelting and rolling products exported from the United Kingdom in 1930 and 1924, together with the quantities imported and retained. The production figures for 1924 include the output of the small firms.

Kind of goods	Produc- tion	Exports	Propor- tion of produc- tion exported	Retained imports	Avail- able for use in the United Kingdom	Share of home market held by British products	
					Th. tons	Th. tons	Per cent.
Steel ingots, other than of special steel	1930	6,882.4	1.1	...	34.8	6,916.1	99.7
	1924	7,772.7	1.2	...	37.7	7,809.2	99.5
Steel blooms, billets and slabs, other than of special steel¶	1930	3,669.8	6.8	0.2	565.6	4,228.6	86.6
	1924*	4,287.3	10.6	0.2	707.1	4,983.8	85.8
Sheet bars ...	1930	744.8	0.6	0.1	446.5	1,190.7	62.5
	1924	935.1	1.0	0.1	357.9	1,292.0	72.3
Tinplate bars	1930	919.5	9.6	1.0	79.6	989.5	92.0
	1924	1,222.9	0.2	...	20.0	1,242.7	98.4
Wire rods ...	1930	217.3	0.9	0.4	90.5	306.9	70.4
	1924	189.2†	4.4	2.3	73.9	258.7†	71.4
Steel girders, beams, joists and pillars ...	1930	359.4	53.6	14.9	120.6	426.4	71.7
	1924	417.0	72.6	17.4	88.4	432.8	79.6
Bright steel bars	1930	77.2	2.3	3.0	8.1	83.0	90.2
	1924		(included with steel bars, rods, angles, etc.)				
Steel bars, rods, angles, shapes and sections, not elsewhere specified, other than of special steel¶	1930	1,540.3	214.4	14.0	389.0	1,714.9	77.2
	1924	1,376.4	273.9	19.9	137.1	1,239.6	88.9
Hoop and strip for all pur- poses ...	1930	397.4	43.0	10.8	161.9	516.3	68.6
	1924	445.9	69.5§	15.6	35.4§	411.8	91.4
Plates and sheets, not galvanised, not tinned, etc. :-							
Steel plates and sheets not under ½ inch thick (including armour plates) ...	1930	1,081.6	130.8	12.1	129.6	1,080.4	88.0
	1924	1,130.2	183.6	16.2	122.4	1,069.0	88.5
Black sheets under ½ inch thick	1930	856.9	184.0	21.5	12.7	685.6	98.1
	1924	1,020.4	246.7	24.2	6.0	779.7	99.2



Kind of goods	Production	Exports	Proportion of production exported	Retained imports	Available for use in the United Kingdom	Share of home market held by British products
Galvanised sheets :—						
Flat	1930 97·2†	77·6	79·8	0·7	20·3	96·3
	1924 161·1	140·9	87·5	0·1	20·3	99·5
Corrugated	1930 432·8†	354·1	82·3	0·1	78·8	99·9
	1924 549·5	508·9	92·6	**	40·6	100·0
Steel railway rails, including conductor rails for electric traction...						
	1930 446·7	239·2	53·6	17·8	225·3	92·1
	1924 537·1	173·5	32·3	20·5	384·1	94·7

¶ The production figures for 1930 include special steel.

\* Including iron blooms, billets, etc.

† Not including wire rods made by wire-drawing firms and used in the makers' works.

§ "Hoops and strips for tubes" and "hoops, baling and barrel."

‡ Not including 1,100 tons of unclassified galvanised sheets.

\*\* Less than 50 tons.

|| Excluding output of railway companies.

**Structural work.**—The total value of iron and steel structural work (e.g., bridge construction and steel framework for buildings) carried out by firms in the Iron and Steel (Smelting and Rolling) Trade was recorded as £911,000 in 1930 and £925,000 in 1924. These amounts represent the net contract price of the work (or of such part as was completed within the year of return) less the value of any sections, girders, etc., made in the firms' own works and used in the work; the quantities and values of such materials are included under the appropriate headings in the foregoing table of principal products. This class of work, with other forms of constructional engineering, is dealt with in the report on the Mechanical Engineering Trade (see page 266).

**Work done for the trade or on commission.**—The total amount recorded as received for tilting, rolling, galvanising and other work done for the trade or on commission in 1930 was £943,000, as compared with £1,206,000 in 1924. The total for 1930 includes a sum of £7,000, and that for 1924 a sum of £10,000, recorded on schedules for other trades. The amounts recorded for the different kinds of work were as follows :—

	1930	1924
	£'000	£'000
Tilting, rolling, etc. ... ..	561	950
Galvanising* ... ..	225	229
Jobbing engineering and repair work	100	27
Other work ... ..	57	—
<b>TOTAL</b> ... ..	<b>943</b>	<b>1,206</b>

\* See also report on Hardware, Hollow-ware, Metallic Furniture and Sheet Metal Trades (page 101).

**Other products.**—In addition to the output shown in the table of principal products on pages 38-40, the following goods were produced in 1930 and 1924 by firms that made their returns on schedules for the Iron and Steel (Smelting and Rolling) Trade. These goods are dealt with in the reports on those trades in which the principal output was recorded.

Kind of goods	1930		1924	
	Quantity	Value	Quantity	Value
	Th. tons	£'000	Th. tons	£'000
Black plates under $\frac{1}{2}$ inch thick (up to 54 ins. by 28 ins.) ... ..	69·4	791	36·2	378
Springs :—				
Laminated ... ..	13·1	410	23·3	904
Coil ... ..	3·2	95	5·5	240
Wrought tubes and fittings ... ..	10·4	272	5·8	131
Iron castings ... ..	8·8	121	44·7	468
Machinery and plant ... ..	...	180	...	...
Tools and implements (including cutlery) ... ..	...	265	...	...
Iron and steel wire and manufactures thereof (including wire nails and staples) ... ..	10·0	165	...	542
Bolts, nuts, rivets, washers, etc., including nails and tacks (other than wire nails and staples) ... ..	15·3	199	...	...
Other manufactures of iron and steel ... ..	...	1,049	...	...
Manufactures of non-ferrous metals ... ..	...	84	...	36
Ground basic slag for manure ... ..	115·5	116	242·6	277
Other goods made ... ..	...	22	...	69
Electricity supplied to other undertakings of the firm or to outside consumers ... ..	70·5	165	17·6	62
	Mill. B.T.U. (Kw.-hrs.)		Mill. B.T.U. (Kw.-hrs.)	
<b>TOTAL VALUE</b> ... ..	...	<b>3,934</b>	...	<b>3,107</b>

**Scrap, waste and by-products sold.**—The following output of manufacturers' scrap and of waste and by-products was recorded by firms in the Iron and Steel (Smelting and Rolling) Trade in 1930 and 1924 :—



Kind of goods	1930		1924	
	Quantity	Value	Quantity	Value
	Th. tons	£'000	Th. tons	£'000
Iron and steel scrap ...	445.3	1,250	613.4	2,408
Scrap of non-ferrous metals ...	...	12	...	27
Slag, not ground ...	334.4	80	...	365
Cinder, etc. ...	211.1	172	...	...
Crushed stone, slag and clinker ...	104.4	19	*	*
Other waste and by-products sold	...	169	...	165
<b>TOTAL</b> ...	...	1,702	...	2,965

\* Not separately recorded.

The figures for iron and steel scrap do not represent the whole of the scrap produced in the course of manufacture but only that part which was sold in the year or added to stock at the end of the year. Sales of iron and steel scrap were recorded by the majority of the metal working trades and for particulars of the amounts returned reference should be made to the reports on the individual trades.

Particulars are not available for 1930 in respect of metal scrap recovered by such processes as the dismantling of ships and the breaking-up of machinery and old metal goods.

#### Value of output free from duplication

Certain kinds of semi-finished iron and steel products were sold as material to other firms (or transferred to other departments of the same firm) whose returns were also made on schedules for the Iron and Steel (Smelting and Rolling) Trade, and the value of these products is thus recorded more than once in the value of the gross output of the trade. The most important of these products are steel blooms, billets and slabs, sheet bars, and black sheets, but duplication also arises to some extent in the values of steel ingots and some other goods shown as made for sale. The total value of the output of goods the value of which may be partly duplicated amounted in 1930 to £15,912,000 and, so far as can be estimated from the information available, the amount of duplication in this figure was between £8,800,000 and £9,500,000. In addition, some duplication probably also arises from inter-sales of scrap iron and steel; further, some part of the total amount returned as received for work done for the trade (not exceeding the sum of £583,000 paid for work given out to other firms) is duplicated in the selling value of the products.

The total amount of duplication in the value of the gross output of the Iron and Steel (Smelting and Rolling) Trade in 1930 may be estimated approximately as between £9 million and £11 million and the value of the output free from duplication as between £73.5 million and £75.5 million. Owing to the wider range of products covered by the schedule for this trade at the 1924 Census, the estimate made for that year is not comparable with this figure.

#### Employment and Wages

**Employment.**—The following table shows the average numbers of persons employed in 1930 and 1924:—

Persons employed	Males		Females		Total	
	Under 18	All ages	Under 18	All ages	Under 18	All ages
<b>1930</b>						
Operatives (average for the year) ...	8,085	122,521	244	1,195	8,329	123,716
Administrative, technical and clerical staff (as at 18th October) ...	1,055	10,730	333	1,971	1,388	12,701
<b>TOTAL</b> ...	9,140	133,251	577	3,166	9,717	136,417
<b>1924</b>						
Operatives (average for the year) ...	11,257	144,060	385	1,542	11,642	145,602
Administrative, technical and clerical staff (as at 18th October) ...	1,009	10,797	142	1,548	1,151	12,345
<b>TOTAL</b> ...	12,266	154,857	527	3,090	12,793	157,947

**Wages.**—The available information as to the amount of wages paid in 1930 and 1924 is given on pages 18 and 19.

#### BLAST FURNACES AND IRON AND STEEL (SMELTING AND ROLLING)

##### Power

The following table shows the capacity of prime movers, electric generators and electric motors ordinarily in use and in reserve or idle at blast furnaces and steel smelting works and rolling mills in 1930 and 1924. As the result of comparisons between the returns for the two years, certain defects in the particulars furnished in the Final Report on the 1924 Census have been brought to light and the figures now given should be regarded as substituting those previously published.



Power equipment	1930			1924		
	Ordinarily in use	In reserve or idle	Total	Ordinarily in use	In reserve or idle	Total
<b>PRIME MOVERS</b>	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.
Reciprocating steam engines ...	848,370	310,598	1,158,968	1,065,114	259,120	1,324,234
Steam turbines ...	429,307	176,640	605,947	301,196	152,467	453,663
Internal combustion engines:—						
Gas ...	108,526	48,503	157,029	80,805	43,937	124,742
Petrol, kerosene or other light oils ...	57	50	107	131	17	148
Heavy oils ...	373	490	863	364	—	364
Water engines ...	802	322	1,124	97	30	127
Other prime movers	212	—	212	986	115	1,101
<b>TOTAL ...</b>	<b>1,387,647</b>	<b>536,603</b>	<b>1,924,250</b>	<b>1,448,693</b>	<b>455,686</b>	<b>1,904,379</b>
<b>ELECTRIC GENERATORS</b>	Kw.	Kw.	Kw.	Kw.	Kw.	Kw.
<b>Driven by</b>						
Reciprocating steam engines...	24,177	21,127	45,304	30,478	25,375	55,853
Steam turbines ...	166,993	96,908	263,901	154,050	75,712	229,762
Internal combustion engines:—						
Gas ...	46,146	24,460	70,606	39,344	21,062	60,406
Petrol, kerosene or other light oils ...	20	30	50	22	—	22
Heavy oils ...	134	272	406	242	—	242
Water engines ...	351	8	359	4	—	4
<b>TOTAL ...</b>	<b>237,821</b>	<b>142,805</b>	<b>380,626</b>	<b>224,140</b>	<b>122,149</b>	<b>346,289</b>
<b>ELECTRIC MOTORS</b>	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.
<b>Driven by</b>						
Electricity generated in same works ...	421,616	116,855	538,471	428,824	94,153	522,977
Electricity generated in other works under same ownership ...	130,094	19,696	149,790	11,076	2,335	13,411
Purchased electricity ...	376,024	102,545	478,569	324,450	52,641	377,091
<b>TOTAL ...</b>	<b>927,734</b>	<b>239,096</b>	<b>1,166,830</b>	<b>764,350</b>	<b>149,129</b>	<b>913,479</b>

The figures given above represent an aggregation of the items recorded on schedules for Blast Furnaces and for the Iron and Steel (Smelting and Rolling) Trade. Where blast furnaces and steel works were combined in a single plant, electric motors driven by electricity supplied from one section to the other were classified in the 1930 return for the receiving works as driven by "Electricity generated in other works under same ownership", whereas had the entire plant been dealt with as one unit, a considerably larger proportion of the total motor equipment would have been recorded as driven by "electricity generated in same works".

For 1924, firms were not required to state separately the capacity of motors which were driven by current generated at another of their works, and in the case of the composite undertakings referred to above the method of recording such motors was not uniform, some being shown as driven by "electricity generated in same works" and some as driven by purchased electricity. These factors considerably affect the comparability of the figures given for the two years in respect of the three specified categories of electric motors.

#### Consumption of fuel

The following table shows the quantities of coal, coke and electricity recorded as used at blast furnaces and steel smelting works and rolling mills in 1930:—

Kind of fuel used	For power (driving engines)	For other purposes (so far as recorded)	For power and other purposes, not separately distinguished
Coal ...	Tons 2,089,603	Tons 4,283,436*	Tons 260,402
Coke ...	399,612	6,273,335*	555,736
Electricity used for all purposes:—			B.T.U. (Kw.-hrs.) '000
Generated in same works ...			510,343
Generated in other works under same ownership ...			122,598
Purchased ...			282,771
<b>TOTAL—Electricity ...</b>			<b>915,712</b>

\* These figures were recorded by firms representing 88.9 per cent. of the net output of the whole trade.

On the basis of the large proportion of the trade for which particulars of coal and coke used "for other purposes" were furnished it may be estimated that the total consumption of coal



at blast furnaces and smelting and rolling mills in 1930 was between 7 million and  $7\frac{1}{4}$  million tons, and of coke approximately 8 million tons. Of these amounts, the proportion used for power purposes was roughly 30 per cent. for coal and 5 per cent. for coke.

The figures shown under the first two headings of "Electricity used" are subject to the qualifications mentioned in regard to motor equipment (see page 49). There was included as part of the output of these trades (see pages 32 and 45) a total of 391.7 million Board of Trade units of electricity supplied "to other undertakings of the firm or to outside consumers" and it should be borne in mind that some proportion of this total is probably duplicated in the amount (122.6 million B.T. units) shown in the above table as generated in other works under the same ownership.

## TABLES

## BLAST FURNACES

## I. Summary of results

Particulars	Unit	England and Wales	Scotland	Great Britain
Value of products (Gross output) ...	£'000	21,682	2,138	23,820
Cost of materials used ...	"	17,966	1,906	19,872
Net output ...	"	3,716	232	3,948
Average number of persons employed	No.	17,337	2,025	19,362
Net output per person employed ...	£	214	114	204

## II. Production

Goods sold or added to stock	Unit	England and Wales	Scotland	Great Britain
<b>Pig iron :—</b>				
Forge ...	<i>Th. tons</i>	244.2	41.7	285.9
	£'000	833	153	986
Foundry ...	<i>Th. tons</i>	1,350.6	209.9	1,560.5
	£'000	4,402	793	5,195
Acid (hematite) ...	<i>Th. tons</i>	1,566.3	259.9	1,826.2
	£'000	5,646	1,009	6,655
Basic ...	<i>Th. tons</i>	2,436.6	11.8	2,448.4
	£'000	7,854	41	7,895
Total—Pig iron ...	<i>Th. tons</i>	5,597.7	523.3	6,121.0
	£'000	18,735	1,996	20,731
<b>Ferro-alloys :—</b>				
Spiegeleisen ...	<i>Th. tons</i>	34.9	—	34.9
	£'000	192	—	192
Ferro-manganese ...	<i>Th. tons</i>	90.8	—	90.8
	£'000	970	—	970
Ferro-silicon and other ferro-alloys	<i>Th. tons</i>	3.4	—	3.4
	£'000	21	—	21
Total—Ferro-alloys ...	<i>Th. tons</i>	129.1	—	129.1
	£'000	1,183	—	1,183
Iron castings in the rough ...	<i>Th. tons</i>	*	*	17.6
	£'000	*	*	85
Ground slag ...	<i>Th. tons</i>	*	*	517.7
	£'000	*	*	161
Slag, not ground	<i>Th. tons</i>	*	*	757.5
	Quantity stated	£'000	*	116
	Quantity not stated	£'000	*	28



Goods sold or added to stock	Unit	England and Wales	Scotland	Great Britain
Cinder ... ..	<i>Th. tons</i>	*	*	198·3
	£'000	*	*	40
Tarred macadam ... ..	<i>Th. tons</i>	489·3	—	489·3
	£'000	298	—	298
Cement, crushed stone, clinker and other building and paving materials	£'000	*	*	74
	<i>Mill.B.T.U.</i>	300·1	21·1	321·2
Electricity sold ... ..	£'000	570	63	633
Gas sold ... ..	£'000	*	*	461
Waste heat (steam) and water sold ...	£'000	10	—	10
<b>TOTAL VALUE OF PRODUCTS (GROSS OUTPUT) ... ..</b>	£'000	21,682	2,138	23,820

\* Owing to the possible disclosure of information relating to individual firms, separate particulars for England and Wales and for Scotland cannot be given.

### III. Employment

#### A.—NUMBERS EMPLOYED IN WEEK ENDED 18TH OCTOBER, 1930

Persons employed	Males		Females		Males and females	
	Under 18	All ages	Under 18	All ages	Under 18	All ages
<i>England and Wales :—</i>						
Operatives ... ..	278	13,637	—	24	278	13,661
Administrative, etc.* ...	65	1,049	22	122	87	1,171
<b>TOTAL ... ..</b>	<b>343</b>	<b>14,686</b>	<b>22</b>	<b>146</b>	<b>365</b>	<b>14,832</b>
<i>Scotland :—</i>						
Operatives ... ..	71	1,490	5	33	76	1,523
Administrative, etc.* ...	15	92	2	16	17	108
<b>TOTAL ... ..</b>	<b>86</b>	<b>1,582</b>	<b>7</b>	<b>49</b>	<b>93</b>	<b>1,631</b>
<i>Great Britain :—</i>						
Operatives ... ..	349	15,127	5	57	354	15,184
Administrative, etc.* ...	80	1,141	24	138	104	1,279
<b>TOTAL ... ..</b>	<b>429</b>	<b>16,268</b>	<b>29</b>	<b>195</b>	<b>458</b>	<b>16,463</b>

\* Administrative, technical and clerical staff.

#### B.—OPERATIVES EMPLOYED IN ONE WEEK IN EACH MONTH OF 1930

Week ended	Males and females			Week ended	Males and females		
	England and Wales	Scotland	Great Britain		England and Wales	Scotland	Great Britain
Jan. 18 ...	18,731	2,101	20,832	July 19 ...	15,202	1,905	17,107
Feb. 15 ...	18,718	2,238	20,956	Aug. 16 ...	14,179	1,592	15,771
Mar. 15 ...	18,672	2,345	21,017	Sept. 13 ...	14,541	1,714	16,255
April 12 ...	18,448	2,328	20,776	Oct. 18 ...	13,661	1,523	15,184
May 17 ...	17,621	2,252	19,873	Nov. 15 ...	13,762	1,534	15,296
June 21 ...	16,800	2,178	18,978	Dec. 13 ...	13,659	1,289	14,948
<b>AVERAGE FOR THE 12 MONTHS ... ..</b>	<b>...</b>	<b>...</b>	<b>...</b>	<b>...</b>	<b>16,166</b>	<b>1,917</b>	<b>18,083</b>

## IRON AND STEEL (SMELTING AND ROLLING)

### I. Summary of results

Particulars	Unit	England and Wales	Scotland	Great Britain
Value of goods made and work done (Gross output) ... ..	£'000	72,960	11,406	84,366
Cost of materials used ... ..	"	50,229	7,977	58,206
Paid for work given out to other firms... ..	"	571	12	583
Net output ... ..	"	22,160	3,417	25,577
Average number of persons employed ...	No.	118,475	17,942	136,417
Net output per person employed ...	£	187	190	187



## II. Production

A.—TOTAL MAKE OF THE PRODUCTS SPECIFIED, AS RETURNED ON SCHEDULES FOR THE IRON AND STEEL (SMELTING AND ROLLING) TRADE

Kind of goods	England and Wales	Scotland	Great Britain
	Th. tons	Th. tons	Th. tons
Steel ingots, other than of special steel ... ..	5,660.5	1,221.9	6,882.4
Ingots of special steel :—			
Electric ... ..	*	*	45.3
Crucible ... ..	*	*	8.0
Other (including electric and crucible, not separately distinguished)† ... ..	*	*	2.3
Total—Ingots of special steel ... ..	*	*	55.6
Steel castings ... ..	57.6	10.0	67.6
Steel blooms, billets and slabs ... ..	2,807.8	856.9	3,664.7
Sheet bars ... ..	*	*	744.7
Tinplate bars ... ..	919.5	—	919.5
Wire rods ... ..	157.3	—	157.3
Steel girders, beams, joists and pillars ... ..	*	*	356.8
Bright steel bars ... ..	*	*	68.9
Steel bars, rods, angles, shapes and sections, not elsewhere specified ... ..	1,262.5	272.7	1,535.2
Puddled bars ... ..	73.9	36.4	110.3
Scrap bars ... ..	128.0	30.6	158.6
Iron bars, rods, angles, shapes and sections, not elsewhere specified ... ..	138.3	25.6	163.9
Hoop, baling and barrel :—			
Iron ... ..	*	*	1.4
Steel ... ..	49.7	5.3	55.0
Hoop and strip for tubes :—			
Iron ... ..	29.4	22.1	51.5
Steel ... ..	74.3	84.0	158.3
Hoop, baling and barrel, and hoop and strip for tubes, not separately distinguished ... ..	28.6	—	28.6
Hoop and strip for other purposes ... ..	*	*	90.8
Plates and sheets, not galvanised, not tinned, etc. :—			
Iron plates and sheets not under $\frac{1}{8}$ inch thick ... ..	*	*	1.9
Iron plates and sheets under $\frac{1}{8}$ inch thick ... ..	*	*	1.8
Steel plates and sheets not under $\frac{1}{8}$ inch thick (including armour plates) ... ..	666.2	412.5	1,078.7
Black sheets under $\frac{1}{8}$ inch thick (over 54 in. by 28 in.) ... ..	738.9	81.0	819.9
Black plates under $\frac{1}{8}$ inch thick (up to 54 in. by 28 in.) ... ..	68.7	8.9	77.6
TOTAL—Plates and sheets, not galvanised, not tinned, etc. ... ..	1,474.3	505.6	1,979.9

\* Owing to the possible disclosure of information relating to individual firms, separate particulars for England and Wales and for Scotland cannot be given.

† So far as separately recorded.

B.—OUTPUT SOLD OR ADDED TO STOCK AND WORK DONE

Kind of goods made and work done	Unit	England and Wales	Scotland	Great Britain
		Th. tons	Th. tons	Th. tons
Steel ingots, other than of special steel	Th. tons	353.5	41.5	395.0
Ingots of special steel :—	£'000	1,675	266	1,941
Electric ... ..	Th. tons	17.9	—	17.9
Crucible ... ..	£'000	373	—	373
Other ... ..	Th. tons	2.8	—	2.8
Refined pig iron†	£'000	247	—	247
Steel castings ... ..	Th. tons	1.0	—	1.0
Steel blooms, billets and slabs ... ..	£'000	149	—	149
Sheet bars ... ..	Th. tons	16.7	—	16.7
Tinplate bars ... ..	£'000	96	—	96
Wire rods ... ..	£'000	108	—	108
Steel girders, beams, joists and pillars ... ..	Th. tons	48.6	9.1	57.7
Bright steel bars ... ..	£'000	1,897	348	2,245
Steel bars, rods, angles, shapes and sections, not elsewhere specified ... ..	Th. tons	728.8	97.9	826.7
Puddled bars ... ..	£'000	5,266	752	6,018
Scrap bars ... ..	Th. tons	*	*	458.0
Iron bars, rods, angles, shapes and sections, not elsewhere specified ... ..	£'000	*	*	2,606
Hoop, baling and barrel :—	Th. tons	910.8	—	910.8
Iron ... ..	£'000	5,323	—	5,323
Steel ... ..	Th. tons	151.3	—	151.3
Hoop and strip for tubes :—	£'000	1,355	—	1,355
Iron ... ..	Th. tons	*	*	354.2
Steel ... ..	£'000	*	*	2,618
Hoop, baling and barrel, and hoop and strip for tubes, not separately distinguished ... ..	Th. tons	*	*	67.6
Hoop and strip for other purposes ... ..	£'000	*	*	1,258
TOTAL—Plates and sheets, not galvanised, not tinned, etc. ... ..	Th. tons	1,200.6	269.8	1,470.4
Iron plates and sheets not under $\frac{1}{8}$ inch thick ... ..	£'000	11,950	2,193	14,143
Iron plates and sheets under $\frac{1}{8}$ inch thick ... ..	Th. tons	*	*	3.5
Steel plates and sheets not under $\frac{1}{8}$ inch thick (including armour plates) ... ..	£'000	*	*	25
Black sheets under $\frac{1}{8}$ inch thick (over 54 in. by 28 in.) ... ..	Th. tons	*	*	3.6
Black plates under $\frac{1}{8}$ inch thick (up to 54 in. by 28 in.) ... ..	£'000	*	*	20
TOTAL—Plates and sheets, not galvanised, not tinned, etc. ... ..	Th. tons	136.4	24.4	160.8
Hoop, baling and barrel, and hoop and strip for tubes, of iron and steel, not separately distinguished ... ..	£'000	1,441	255	1,696
Hoop and strip for other purposes ... ..	Th. tons	*	*	1.4
Iron ... ..	£'000	*	*	16
Steel ... ..	Th. tons	49.0	5.3	54.3
Hoop, baling and barrel, and hoop and strip for tubes :—	£'000	460	46	506
Iron ... ..	Th. tons	28.8	22.0	50.8
Steel ... ..	£'000	319	268	587
Hoop, baling and barrel, and hoop and strip for tubes, of iron and steel, not separately distinguished ... ..	Th. tons	73.8	84.0	157.8
Hoop and strip for other purposes ... ..	£'000	566	693	1,259
TOTAL—Plates and sheets, not galvanised, not tinned, etc. ... ..	Th. tons	28.4	—	28.4
Iron plates and sheets not under $\frac{1}{8}$ inch thick ... ..	£'000	246	—	246
Iron plates and sheets under $\frac{1}{8}$ inch thick ... ..	Th. tons	*	*	87.8
Steel plates and sheets not under $\frac{1}{8}$ inch thick (including armour plates) ... ..	£'000	*	*	1,387



Kind of goods made and work done	Unit	England and Wales	Scotland	Great Britain
Plates and sheets, not galvanised, not tinned, etc. :—				
Iron plates and sheets not under ½ inch thick ... ..	Th. tons	*	*	1.9
...	£'000	*	*	29
Iron plates and sheets under ½ inch thick ... ..	Th. tons	*	*	1.4
...	£'000	*	*	26
Steel plates and sheets not under ½ inch thick (including armour plates) ... ..	Th. tons	663.5	412.1	1,075.6
...	£'000	6,032	3,522	9,554
Black sheets under ½ inch thick (over 54 in. by 28 in.) ... ..	Th. tons	*	*	453.7
...	£'000	*	*	5,134
Galvanised sheets :—				
Flat ... ..	Th. tons	*	*	97.2
...	£'000	*	*	1,426
Corrugated ... ..	Th. tons	*	*	431.8
...	£'000	*	*	5,678
Railway, etc., material :—				
Steel rails, new—				
Grooved for trams ... ..	Th. tons	*	*	32.0
...	£'000	*	*	303
Railway (including conductor rails for electric traction) ... ..	Th. tons	*	*	446.7
...	£'000	*	*	3,481
Sleepers and fishplates ... ..	Th. tons	*	*	79.3
...	£'000	*	*	709
Tyres and axles ... ..	Th. tons	*	*	77.7
...	£'000	*	*	1,623
Other railway, etc., material (including railway spikes) ... ..	Th. tons	*	*	70.0
...	£'000	*	*	1,171
Steel forgings, other than tyres, wheels and axles ... ..	Th. tons	*	*	54.0
...	£'000	*	*	2,253
Other smelting and rolling products ... ..	Th. tons	30.9	0.8	31.7
...	£'000	1,251	23	1,274
Total of above ... { Quantity stated	Th. tons	6,972.9	1,158.6	8,131.5
...	£'000	66,224	10,551	76,775
...	£'000	108	—	108
Black plates under ½ inch thick (up to 54 ins. by 28 ins.) ... ..	Th. tons	60.5	8.9	69.4
...	£'000	704	87	791
Springs :—				
Laminated ... ..	Th. tons	13.1	—	13.1
...	£'000	410	—	410
Coil ... ..	Th. tons	3.2	—	3.2
...	£'000	95	—	95
Wrought tubes and fittings ... ..	Th. tons	10.4	—	10.4
...	£'000	272	—	272
Iron castings ... ..	Th. tons	*	*	8.8
...	£'000	*	*	121
Machinery and plant ... ..	£'000	145	35	180
Tools and implements (including cutlery)	£'000	*	*	265

Kind of goods made and work done	Unit	England and Wales	Scotland	Great Britain
Iron and steel wire and manufactures thereof (including wire nails and staples) ... ..	Th. tons	*	*	10.0
...	£'000	*	*	165
Bolts, nuts, rivets, washers, etc., including nails and tacks (other than wire nails and staples) ... ..	Th. tons	*	*	15.3
...	£'000	*	*	199
Other manufactures of iron and steel	£'000	904	145	1,049
Manufactures of non-ferrous metals ...	£'000	84	—	84
Ground basic slag for manure ... ..	Th. tons	115.5	—	115.5
...	£'000	116	—	116
Other goods made ... ..	£'000	14	8	22
Electricity supplied to other undertakings of the firm or to outside consumers ... ..	Mill. B.T.U. (Kw.-hrs.)	69.6	0.9	70.5
...	£'000	163	2	165
Iron and steel scrap ... ..	Th. tons	388.1	57.2	445.3
...	£'000	1,058	192	1,250
Scrap of non-ferrous metals ... ..	£'000	11	1	12
Slag, not ground ... ..	Th. tons	271.8	62.6	334.4
...	£'000	77	3	80
Cinder, etc. ... ..	Th. tons	141.4	69.7	211.1
...	£'000	119	53	172
Crushed stone, slag and clinker ... ..	Th. tons	104.4	—	104.4
...	£'000	19	—	19
Other waste and by-products sold	£'000	153	16	169
		Amount received	Amount received	Amount received
Iron and steel structural work ...	£'000	773	138	911
Work done for the trade or on commission :—				
Tilting, rolling, etc. ... ..	£'000	*	*	555
Galvanising ... ..	£'000	111	114	225
Jobbing engineering and repair work	£'000	100	—	100
Other work ... ..	£'000	53	3	56
TOTAL VALUE OF GOODS MADE AND WORK DONE (GROSS OUTPUT) ...	£'000	72,960	11,406	84,366

\* Owing to the possible disclosure of information relating to individual firms, particulars for England and Wales and for Scotland cannot be given separately.

† So far as separately recorded.



## III. Employment

## A.—NUMBERS EMPLOYED IN WEEK ENDED 18TH OCTOBER, 1930

Persons employed	Males		Females		Males and females	
	Under 18	All ages	Under 18	All ages	Under 18	All ages
<i>England and Wales :—</i>						
Operatives ... ..	6,241	95,175	204	1,020	6,445	96,195
Administrative, etc.*	929	9,469	301	1,700	1,230	11,169
TOTAL ... ..	7,170	104,644	505	2,720	7,675	107,364
<i>Scotland :—</i>						
Operatives ... ..	1,091	15,761	5	62	1,096	15,823
Administrative, etc.*	126	1,261	32	271	158	1,532
TOTAL ... ..	1,217	17,022	37	333	1,254	17,355
<i>Great Britain :—</i>						
Operatives ... ..	7,332	110,936	209	1,082	7,541	112,018
Administrative, etc.*	1,055	10,730	333	1,971	1,388	12,701
TOTAL ... ..	8,387	121,666	542	3,053	8,929	124,719

\* Administrative, technical and clerical staff.

## B.—OPERATIVES EMPLOYED IN ONE WEEK IN EACH MONTH OF 1930

Week ended	Males and females			Week ended	Males and females		
	England and Wales	Scotland	Great Britain		England and Wales	Scotland	Great Britain
Jan. 18...	118,344	18,439	136,783	July 19 ...	108,089	12,434	120,523
Feb. 15...	116,092	17,955	134,047	Aug. 16...	101,781	16,927	118,708
Mar. 15...	115,491	18,330	133,821	Sept. 13...	101,181	16,167	117,348
Apl. 12...	113,866	17,904	131,770	Oct. 18 ...	96,195	15,823	112,018
May 17...	112,068	17,241	129,309	Nov. 15...	96,249	15,085	111,334
June 21...	111,476	16,537	128,013	Dec. 13...	96,841	14,082	110,923
AVERAGE FOR THE 12 MONTHS ... ..					107,306	16,410	123,716

## BLAST FURNACES AND IRON AND STEEL (SMELTING AND ROLLING)

## IV. Power

## PARTICULARS OF PRIME MOVERS, ELECTRIC GENERATORS AND ELECTRIC MOTORS

Power equipment	England and Wales		Scotland		Great Britain	
	Ordinarily in use	In reserve or idle	Ordinarily in use	In reserve or idle	Ordinarily in use	In reserve or idle
<b>PRIME MOVERS</b>						
Reciprocating steam engines ... ..	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.
706,034	218,782	142,336	91,816	848,370	310,598	
Steam turbines ... ..	379,726	158,422	49,581	18,218	429,307	176,640
Internal combustion engines :—						
Gas ... ..	108,526	47,385	—	1,118	108,526	48,503
Petrol, kerosene, or other light oils...	52	50	5	—	57	50
Heavy oils ... ..	373	490	—	—	373	490
Water engines ... ..	637	182	165	140	802	322
Other... ..	212	—	—	—	212	—
TOTAL ... ..	1,195,560	425,311	192,087	111,292	1,387,647	536,603
TOTAL OF PRIME MOVERS INSTALLED	1,620,871		303,379		1,924,250	
<b>ELECTRIC GENERATORS</b>						
Driven by	Kw.	Kw.	Kw.	Kw.	Kw.	Kw.
Reciprocating steam engines ...	22,850	20,188	1,327	939	24,177	21,127
Steam turbines ... ..	135,343	86,958	31,650	9,950	166,993	96,908
Internal combustion engines :—						
Gas ... ..	46,146	24,454	—	6	46,146	24,460
Petrol, kerosene, or other light oils ... ..	20	30	—	—	20	30
Heavy oils ... ..	134	272	—	—	134	272
Water engines ... ..	151	8	200	—	351	8
TOTAL ... ..	204,644	131,910	33,177	10,895	237,821	142,805
TOTAL OF ELECTRIC GENERATORS INSTALLED	336,554		44,072		380,626	



Power equipment	England and Wales		Scotland		Great Britain	
	Ordinarily in use	In reserve or idle	Ordinarily in use	In reserve or idle	Ordinarily in use	In reserve or idle
ELECTRIC MOTORS	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.
Driven by						
Electricity generated in same works ... ..	346,917	106,237	74,699	10,618	421,616	116,855
Electricity generated in other works under same ownership ... ..	129,831	19,696	263	—	130,094	19,696
Purchased electricity ... ..	327,480	90,026	48,544	12,519	376,024	102,545
TOTAL ... ..	804,228	215,959	123,506	23,137	927,734	239,096
TOTAL OF ELECTRIC MOTORS INSTALLED	1,020,187		146,643		1,166,830	

### V. Consumption of fuel

Kind of fuel used	England and Wales	Scotland	Great Britain
	Tons	Tons	Tons
Coal used for power*... ..	1,606,424	483,179	2,089,603
Coke used for power* ... ..	399,363	249	399,612
	B.T.U. (Kw.-hrs.) '000	B.T.U. (Kw.-hrs.) '000	B.T.U. (Kw.-hrs.) '000
Electricity used for all purposes :—			
Generated in same works ... ..	463,119	47,224	510,343
Generated in other works under same ownership ... ..	122,083	515	122,598
Purchased ... ..	238,166	44,605	282,771
TOTAL—Electricity ... ..	823,368	92,344	915,712

\* In addition, 260,402 tons of coal (244,148 tons in England and Wales and 16,254 tons in Scotland) and 555,736 tons of coke (555,096 tons in England and Wales and 640 tons in Scotland) were recorded as used for power and for other purposes, not separately distinguished.