

THE CHEMICAL AND ALLIED TRADES

GENERAL REPORT

The following report summarises in comparable form the principal results of the Censuses of 1930 and 1924 for the chemical group of trades, detailed particulars of which are given in the succeeding reports on individual trades. The particulars relate to the United Kingdom, except where otherwise specified, and are confined to production carried out by private firms.

Principal results

The main particulars obtained for 1930 and 1924 are set out in the following table:—

Trade	Gross output (selling value of goods made and value of work done)	Cost of materials used and amount paid for work given out	Net output (excess of col. (2) over col. (3))	Average number of persons employed (except out-workers)	Net output per person employed	Power available †	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
	£'000	£'000	£'000	No.	£	Thous. H.P.	
Chemicals, Dye- stuffs and Drugs* ...	1930	52,653	26,528	24,985‡	70,475	355‡	536·9
	1924	54,472	29,776	23,267‡	66,962	347‡	231·7
Fertiliser, Disin- fectant, Glue, etc.* ...	1930	5,717	3,116	2,601	8,548	304	35·2
	1924	7,695	4,921	2,774	9,661	287	34·2
Soap, Candle and Perfumery* ...	1930	29,105	16,200	12,905	27,010	478	57·8
	1924	32,073	19,738	12,335	29,166	423	34·1
Paint, Colour and Varnish* ...	1930	19,528	10,895	8,633	21,292	405	52·1
	1924	16,948	9,598	7,350	18,502	397	36·5
Seed Crushing ...	1930	21,824	19,407	2,417	10,992	220	67·6
	1924	36,422	32,512	3,910	14,027	279	73·5
Oil and Tallow* ...	1930	16,446	11,496	4,950	8,081	613	14·6
	1924	11,757	9,325	2,432	6,303	386	9·7
Petroleum Re- fining ...	1930	16,087	8,321	5,716‡	5,626	1,016‡	43·2
	1924	14,196	10,733	3,463	6,905	502	47·1
Explosives and Fireworks ...	1930	5,227	2,224	3,003	9,486	317	16·3
	1924	5,306	2,503	2,803	8,553	328	14·9

Trade		Gross output (selling value of goods made and value of work done)	Cost of materials used and amount paid for work given out	Net output (excess of col. (2) over col. (3))	Average number of persons employed (except out-workers)	Net output per person employed	Power available †
(1)		(2)	(3)	(4)	(5)	(6)	(7)
		£'000	£'000	£'000	No.	£	Thous. H.P.
Starch and Polishes ...	1930	6,997	2,997	4,000	7,962	502	10.4
	1924	7,545	3,510	4,035	9,289	434	8.8
Match§ ...	1930	4,264	761	1,483†	4,017	369‡	4.9
	1924	4,388	914	1,724‡	4,876	354‡	5.4
Ink, Gum and Sealing Wax ...	1930	3,468	1,464	2,004	4,029	497	11.1
	1924	2,823	1,274	1,549	3,212	482	5.7
Unclassified Chemical Trades (Northern Ireland)†† ...	1930	436	212	224	633	354	2.2
	1924	437	274	163	638	255	1.6
TOTAL—UNITED KINGDOM§ ...	1930	181,752	103,621	72,921	178,151	409	852.3
	1924	194,062	125,078	65,805	178,094	369	503.2
England and Wales§... ..	1930	165,450	93,812	66,993	161,679	414	788.7
	1924	173,617	111,013	59,539	160,141	372	436.9
Scotland	1930	15,730	9,504	5,661	15,618	363	61.1
	1924	19,849	13,679	6,056	17,058	355	64.5
Northern Ireland§ ...	1930	572	305	267	854	313	2.5
	1924	596	386	210	895	235	1.8

† Total capacity of prime movers and of electric motors driven by purchased electricity.

* Great Britain.

‡ Exclusive of Excise duty estimated as follows:—

	1930	1924
	£'000	£'000
Chemicals, Dyestuffs and Drugs	1,140	1,429
Petroleum Refining	2,050	
Match	2,020	1,750

§ In this and succeeding tables, particulars relating to the Match Trade in Northern Ireland for 1924 have been included in the figures for England and Wales. Separate particulars relating to this trade in 1930 are not available for similar treatment.

†† Includes the Chemicals, etc., Fertiliser, etc., Paint, etc., and Oil and Tallow Trades. In the other trades (except the Soap, Candle and Perfumery Trades and the Match Trade) there was no production in Northern Ireland.

Comparability of results.—At the 1930 Census, Petroleum Refining was classed as a distinct trade for the first time. The provision of comparable details for 1924 has involved considerable amendment of the particulars given in the Final Report on the Third Census for the trade in which Petroleum Refining was then included, viz., the Oil and Tallow Trade, and the results shown in the present report on the revised basis of classification are to be regarded as substituting those previously published. In addition, a number of firms engaged mainly in the manufacture of farinaceous preparations have been transferred from the Starch and Polishes Trade to the Preserved Foods Trade which is included in the food, drink and tobacco group, pages 1-28.

All particulars relating to Great Britain, for both 1930 and 1924, are confined to firms employing more than ten persons, but those relating to Northern Ireland apply to firms employing more than five persons. Subject to the absence of separate record for 1930 of the small production of matches in Northern Ireland, referred to in the foot-note (§) to the preceding table, the results shown for the two years are comparable for each trade except the Fertiliser, Disinfectant, etc., Trades, the gross output value of which is slightly understated for 1930 in relation to 1924 as the result of a change in the method adopted of valuing certain manufactures (see page 301); the net output and employment totals are not affected by this change.

Deficiencies due to the exclusion of small firms in Great Britain.—

There will be found in the report on each trade a section setting out the number of persons reported to have been employed in both 1924 and 1930 by firms employing not more than ten persons, with details of the chief classes of goods made and work done by these firms in the earlier year. Taking the chemical group as a whole, 11,053 persons were stated to have been employed by firms of this class at the 1930 Census and 8,246 (including a small number in Northern Ireland) in 1924. Thus, of the aggregate number of employees recorded by firms of all classes, the proportion employed by the smaller firms was 5.9 per cent. in 1930 and 4.4 per cent. in 1924. Some part of this apparent increase for 1930 is probably due to the inclusion of employees required more for distributive than for productive operations, the instructions given on this point being more explicit at the 1924 Census, when all small firms were required to complete a detailed form of return.

In addition, 111 firms to which schedules were sent furnished no information at the 1930 Census, but these outstanding cases are known to have consisted either of small businesses or of businesses that were in operation for only a part of the censal year. The number of firms that furnished no particulars at the previous Census was about 350.

Periods covered by firms' returns

As explained in Note 1 on page xi, firms were given the option of making returns for the calendar year 1930 or for their period of account most closely corresponding thereto, provided that the ending date of that period was not later than 31st March, 1931. The following table shows, for the chemical group of trades as a whole, the total number of returns and the numbers of persons employed according to the periods covered by the returns received.

Returns in respect of 12 months ended	Number of returns		Persons employed	
	Number	Per cent. of total	Average number	Per cent. of total
April, 1930	17	1.0	735	0.4
May, 1930	27	1.7	1,962	1.1
June, 1930	105	6.5	7,689	4.3
July, 1930	11	0.7	1,542	0.9
August, 1930	25	1.6	3,456	2.0
September, 1930	65	4.1	3,671	2.1
October, 1930	32	2.0	3,567	2.0
November, 1930	38	2.4	3,048	1.7
December, 1930	1,037	64.7	132,036	74.5
January, 1931	27	1.7	2,999	1.7
February, 1931	15	0.9	1,123	0.6
March, 1931	203	12.7	15,469	8.7
TOTAL	1,602	100.0	177,297	100.0

The above particulars relate only to firms in Great Britain, a similar analysis of the returns furnished at the Census of Northern Ireland not being available.

The mean terminal date of the returns in this group of trades was about the end of the third week of December, 1930, and the aggregates for the group as a whole may thus be taken to be fairly representative of the calendar year. This result is not invariably true as regards the production figures shown in the various reports for individual commodities, some of which (e.g. fertilisers) were manufactured principally by firms whose accounting year was a period of twelve months other than the calendar year.

Nearly two-thirds of the total number of returns received were for the calendar year and the firms concerned employed about three-fourths of the total number of employees recorded for the whole group. The following table shows the number of returns and the number of persons employed in each trade in respect of these firms.

Returns covering the twelve months ended 31st December, 1930

Trade	Number of returns		Persons employed	
	Number	Per cent. of total	Average number	Per cent. of total
Chemicals, Dyestuffs and Drugs ...	374	70	55,932	79
Fertiliser, Disinfectant, Glue, etc. ...	46	33	2,185	26
Soap, Candle and Perfumery ...	114	66	21,311	80
Paint, Colour and Varnish ...	229	72	15,027	71
Seed Crushing	17	53	9,599	87
Oil and Tallow	109	65	5,863	73
Petroleum Refining	13	52	3,240	58
Explosives and Fireworks	40	89	9,055	95
Starch and Polishes	39	55	6,469	81
Match	14	45	685	17
Ink, Gum and Sealing Wax	42	66	2,670	66
TOTAL	1,037	65	132,036	74

Production

Gross output.—As between one trade and another the money value of the gross output (column 2 of the table on pages 237-8) is largely dependent on the intrinsic value of the materials from which the products are manufactured, while as between one year and another the figure for the same trade is influenced by changes in the prices of those materials and in manufacturing costs and profits. Further, in certain trades duplication in the gross output value leads to a considerable over-statement of the value of the products as finally delivered, this factor affecting each trade to a different extent. For these reasons the gross output figure does not provide a satisfactory representation of the position either of different trades in relation to each other in a given year or of the same trade in different years.

Net output.—The net output figure eliminates any over-statement due to the factor of duplication but its utility as a basis of comparison between different trades in the same year is subject to the reservations mentioned in the Introductory Notes (pages x and xi); moreover, the relationship between the net output reported by a given trade for different years is affected by fluctuations in the various items which the figure comprises, viz., wages and salaries, rent, sales expenses, etc., as well as depreciation and profits. Measurement of production by net output is therefore only a rough guide and the important qualifications to which the results are subject should not be overlooked. Net output per head eliminates the variable factor of the numbers of persons employed, but the use of figures of net output per head for purposes of comparison is also subject to the qualifications mentioned.

The recorded value of the total net output in the chemical group of trades was greater in 1930 than in 1924 by £7,116,000, or by 11 per cent. The principal advance occurred in the Oil and Tallow Trade, the 1930 total for which was more than double that of 1924, while an increase of 65 per cent. was shown for the Petroleum Refining Trade; among other trades recording increases for 1930 may be mentioned the Ink, Gum and Sealing Wax (30 per cent.) and the Paint, Colour and Varnish Trades (17 per cent.). The only cases in which substantially lower figures were recorded at the 1930 Census were the Seed Crushing and the Match Trades, in which the net output declined by 38 per cent. and 14 per cent. respectively.

The average net output per person employed in the group was £409 in 1930, an increase of nearly 11 per cent. over that shown for 1924 (£369). These averages are unusually high when it is borne in mind that the charge of Excise duty is excluded and that one-fourth of all employees in these trades were females. Exceptionally high figures were shown for the Petroleum Refining Trade (£1,016) and the Oil and Tallow Trade (£613), both in relation to the corresponding figures for 1924 and to the group average for 1930, and the figures for the Starch and Polishes, Soap, Candle and Perfumery, and Ink, etc., Trades were also much in excess of the average. These results may probably be associated with the development of advertising, the cost of which, with other selling expenses, forms a charge on net output. Only in the case of the Seed Crushing Trade was the average net output in 1930 lower than £300 per employee.

Volume of production.—The following table shows, for each principal class of commodities produced by the Chemical and Allied Trades, the total output value recorded for the year 1930, and the result of a re-valuation of the output of similar classes of goods in 1924, based on the average factory values shown by the returns for 1930. This calculation eliminates the factor of price changes, and provides a measure by which the output in the two years may be compared directly. The figures for both years represent the total recorded output, whether returned by firms in the trade chiefly concerned in the production of the specified goods, or by firms in other trades. In order to complete the calculation it has been necessary to make estimates in respect of output aggregating about £15 million in value in respect of which particulars of quantities were not obtained.

The comparatively small production in Northern Ireland is excluded from the particulars for both 1930 and 1924.

Kind of goods	Total production in Great Britain			1930 as a percentage of 1924
	1930	1924		
	As returned	As returned	At 1930 average values	Per cent.
Chemicals, dyestuffs and drugs ...	£'000 52,406	£'000 55,891	£'000 50,126	105
Fertilisers, disinfectants, glue, etc. ...	9,843	11,731	8,635	114
Soap, candles and perfumery ...	27,701	29,791	26,935	103
Paint, colours and varnishes ...	18,781	17,242	15,516	121
Seed oils, oil cake, etc. ...	25,804	41,032	31,448	82
Animal and fish oils, etc. ...	14,293	11,920	10,513	136
Petroleum refined ...	14,332	13,548	11,938	120
Explosives and fireworks ...	5,764	5,648	5,000	115
Starch and polishes ...	7,243	7,730	8,729	83
Matches ...	4,253	4,371	4,299	99
Ink, gum and sealing wax ...	3,670	2,982	2,370	155
TOTAL ...	184,090	201,886	175,509	105

The figures given in the above table represent the gross output value and no allowance for duplication is made for either year. On the assumption that no considerable change occurred in the proportion of the output that was duplicated, the aggregate volume of production was about 5 per cent. greater in 1930 than in 1924; as the total number of employees in these trades was substantially the same in the two years, this increase is also the measure of the variation in the volume of production per employee. If owing to the absorption of smaller units there was less duplication in 1930 than in 1924 the increase in the volume of production, and the volume of production per employee, would have been greater than that recorded. The increase in 1930 in the value of the net output per employee amounted to 11 per cent. (see page 238), so that without allowing for any change that may have taken place in the general level of the charges included in the net output (e.g. in wages and salaries or selling expenses), the volume of production was lower in relation to the net output by about 6 per cent. The relatively greater output of chemical products made in 1924 by trades not included in this group was not sufficient to affect this result by as much as 1 per cent.

Number of establishments

The following table shows the number of separate establishments covered by the results for 1930, and the total number of returns received for 1930 and 1924. In the case of a firm owning more than one establishment situated in the same Census area and engaged in the same Census Trade, a combined return covering all such establishments was usually accepted provided the number of

operatives employed at each establishment was shown separately. The number of establishments reported was thus greater than the number of returns received.

Trade	1930		1924
	Number of establishments	Number of returns	Number of returns
Chemicals, Dyestuffs and Drugs ...	604	534	613
Fertiliser, Disinfectant, Glue, etc. ...	155	140	183
Soap, Candle and Perfumery ...	189	174	189
Paint, Colour and Varnish ...	379	318	289
Seed Crushing ...	59	32	49
Oil and Tallow ...	186	168	178
Petroleum Refining ...	26	25	31
Explosives and Fireworks ...	49	45	41
Starch and Polishes ...	79	71	72
Match ...	34	31	36
Ink, Gum and Sealing Wax ...	74	64	55
TOTAL ...	1,834	1,602	1,736

These figures relate only to firms in Great Britain, the number of establishments not being recorded separately in the report on the Census of Production of Northern Ireland.

Size of firms

In the following table the main particulars recorded at the Census of 1930 for the Chemical and Allied Trades are grouped according to the average numbers of persons shown in the returns. The particulars given in this section relate to firms in Great Britain only.

Size of firm (average numbers employed)	Number of returns	Gross output	Cost of materials	Amount paid for work given out	Net output*	Average number of persons employed (excluding out-workers)	Net output per person employed*
	No.	£'000	£'000	£'000	£'000	No.	£
11-24 ...	547	8,289	5,141	9	3,086	9,243	334
25-49 ...	394	13,486	8,050	1	5,288	13,599	389
50-99 ...	307	21,348	12,819	14	8,216	21,522	382
100-199 ...	192	31,042	16,819	4	13,281	26,461	502
200-299 ...	57	18,387	10,745	4	6,845	13,937	491
300-399 ...	37	17,192	11,288	4	5,409	12,522	432
400-499 ...	15	6,342	3,251	—	2,796	6,752	414
500-749 ...	19	12,124	6,864	—	4,987	11,796	423
750-999 ...	10	5,858	2,631	—	3,086	8,646	357
1,000-1,499 ...	12	16,388	8,765	2	5,841	14,161	412
1,500 and over	12	30,724	16,905	—	13,819	38,658	357
TOTAL ...	1,602	181,180	103,278	38	72,654	177,297	410

* Excluding estimated Excise duty.

The average number of persons recorded in each return was 111. Only 354 returns, or 22 per cent. of the total number, related to establishments employing 100 persons or more, but these establishments contributed 77 per cent. of the total net output of the group and employed about three-fourths of the total personnel.

The figures of average net output per person employed show little significant tendency and the nature of the manufacturing processes carried on by the firms included in each size group was probably a more important factor in determining these averages than the scale on which production was carried on. As the following table shows, this factor may also be of importance among individual trades which are concerned with products of varied kinds.

Net output per person employed

Size of firm (average numbers employed)	Chemicals, Dyestuffs and Drugs*	Fertiliser, Disinfectant, Glue, etc.	Soap, Candle and Perfumery	Paint, Colour and Varnish	Seed Crushing	Oil and Tallow
	£	£	£	£	£	£
11-24 ...	384	251	317	309	114	337
25-49 ...	397	308	450	356		463
50-99 ...	390	318	480	393	167	354
100-199 ...	460	327	565	424	190	1,003
200-299 ...	351	282	411	480		
300-399 ...	398		549	482	403	203
400-499 ...	304	425	480	—		
500-749 ...	347				—	—
750-999 ...	371	—	—	—		
1,000-1,499 ...	301				—	—
1,500 and over	284	—	—	—		
TOTAL ...	355				304	480

* Excluding estimated Excise duty.

The considerable diversity in the figures shown for the Chemicals, Dyestuffs and Drugs Trades may be attributed to the large and varied range of manufactures covered by these trades. In the Fertiliser, etc., Trades, the Paint, etc., Trade and the Seed Crushing Trade net output per employee increased progressively up to the group containing the largest firms, which recorded a figure lower than the average for all firms in each trade.

Regional distribution

In the following table the principal aggregates for the chemical group of trades, as recorded at the Censuses of 1930 and 1924, are grouped according to the areas into which the United Kingdom has been sub-divided:—

Area	Number of returns	Gross output	Net output*	Average number of persons employed (excluding out-workers)	Net output per person employed*	
				No.	£'000	£'000
1. Greater London ...	1930	455	49,225	21,238	45,794	464
	1924	464	49,267	17,649	46,648	378
2. Lancashire with North Cheshire and the Glossop and New Mills District of Derbyshire ...	1930	327	52,467	21,575	49,027	440
	1924	358	56,652	19,944	53,700	371
3. The West Riding of Yorkshire and the City of York ...	1930	125	8,763	2,696	10,055	268
	1924	154	12,738	3,670	10,836	339
4. Northumberland, Durham and the Cleveland district of Yorkshire ...	1930	69	8,784	4,123	13,208	312
	1924	73	5,981	2,467	6,817	362
5. Warwickshire, Worcestershire and Staffordshire ...	1930	89	5,998	2,691	8,458	318
	1924	101	6,068	2,682	7,642	351
6. The rest of England (except Monmouthshire) ...	1930	326	35,274	12,254	32,611	376
	1924†	329	34,980	10,859	30,757	351
7. Glamorganshire, Monmouthshire and Carmarthen-shire ...	1930	24	4,401	2,193	1,940	1,130
	1924	33	7,211	2,037	2,931	695
8. The rest of Wales ...	1930	5	538	223	586	381
	1924	10	720	231	810	285
TOTAL—England and Wales ...	1930	1,420	165,450	66,993	161,679	414
	1924†	1,522	173,617	59,539	160,141	372
9. Lanarkshire, Renfrewshire and Dumbartonshire ...	1930	93	4,669	1,472	4,894	301
	1924	109	6,466	1,850	5,998	308
10. The rest of Scotland	1930	89	11,061	4,189	10,724	391
	1924	105	13,383	4,206	11,060	380
TOTAL—Scotland ...	1930	182	15,730	5,661	15,618	363
	1924	214	19,849	6,056	17,058	355
TOTAL—Great Britain	1930	1,602	181,180	72,654	177,297	410
	1924	1,736	193,466	65,595	177,199	371
11. Northern Ireland ...	1930	8	572	267	854	313
	1924†	6	596	210	895	235
TOTAL—UNITED KINGDOM	1930	1,610	181,752	72,921	178,151	409
	1924	1,742	194,062	65,805	178,094	369

* Excluding estimated Excise duty.

† See footnote (§) to table on page 238; the particulars referred to have been included in area 6.

The principal producing areas in both years were, in order of importance, Lancashire, Greater London and the "rest of England", these three areas covering in 1930 over 75 per cent. of the total net output and over 70 per cent. of the total number of employees. The two largest areas showed a decline in employment between 1924 and 1930 but there was an increase in employment in the "rest of England" and a very marked increase from 6,817 to 13,208 in the North East Coast area. Each of the areas in Scotland showed lower employment figures in 1930. The largest number of returns was received from firms in the Greater London area.

As already explained (see "Size of firms", pages 244-5) the figures of net output per person employed are largely governed by the nature of the output and comparisons between the results shown by the different areas would have little significance.

Employment

The following table shows the average numbers of male and female operatives and administrative, technical and clerical staff in each of the chemical group of trades in the two censal years.

Average numbers (excluding outworkers) employed in 1930 and 1924 in the several Chemical and Allied Trades

Trade	Operatives		Administrative, technical and clerical staff		Total	
	Males	Females	Males	Females		
Chemicals, Dyestuffs and Drugs* ...	1930	46,192	9,594	10,205	4,484	70,475
	1924	46,365	9,259	8,147	3,191	66,962
Fertiliser, Disinfectant, Glue, etc.* ...	1930	5,889	1,153	1,124	382	8,548
	1924	6,711	1,388	1,225	337	9,661
Soap, Candle and Perfumery	1930	10,784	8,405	5,134	2,687	27,010
	1924	11,971	9,809	4,975	2,411	29,166
Paint, Colour and Varnish*	1930	12,450	1,973	5,039	1,830	21,292
	1924	10,812	1,857	4,385	1,448	18,502
Seed Crushing ...	1930	9,044	247	1,347	354	10,992
	1924	11,726	335	1,506	460	14,027
Oil and Tallow* ...	1930	4,145	651	2,454	831	8,081
	1924	3,992	271	1,564	476	6,303
Petroleum Refining ...	1930	4,777	31	738	80	5,626
	1924	5,982	55	776	92	6,905
Explosives and Fireworks...	1930	4,244	4,154	698	390	9,486
	1924	3,587	4,031	638	297	8,553
Starch and Polishes ...	1930	2,787	3,352	1,252	571	7,962
	1924	3,086	4,439	1,233	531	9,289
Match‡ ...	1930	1,359	2,235	307	116	4,017
	1924	1,552	2,919	290	115	4,876
Ink, Gum and Sealing Wax	1930	1,835	795	946	453	4,029
	1924	1,479	742	674	317	3,212
Unclassified Chemical Trades (Northern Ireland)† ...	1930	551	4	61	17	633
	1924	552	7	69	10	638
TOTAL—UNITED KINGDOM ...	1930	104,057	32,594	29,305	12,195	178,151
	1924	107,815	35,112	25,482	9,685	178,094

Trade	Operatives		Administrative, technical and clerical staff		Total	
	Males	Females	Males	Females		
England and Wales†	1930	92,831	30,132	27,275	11,441	161,679
	1924	95,244	32,576	23,359	8,962	160,141
Scotland ...	1930	10,564	2,399	1,925	730	15,618
	1924	11,904	2,447	2,003	704	17,058
Northern Ireland† ...	1930	662	63	105	24	854
	1924	667	89	120	19	895

* Great Britain.

† See footnote (§) to table on page 238.

‡ Includes the Chemicals, etc., Fertiliser, etc., Paint, etc., and Oil and Tallow Trades.

Distribution by status.—A decline of 6,276 in the total number of operatives in 1930 was counterbalanced by an increase of 6,333 in the number of administrative, technical and clerical staff, there being a net increase of 57 persons. Operatives formed 76·7 per cent. of all employees in 1930 and 80·3 per cent. in 1924. Of the 11 specific trades shown in the table, the number of operatives increased in 5, the principal advances being in the Ink, Gum and Sealing Wax Trades (18 per cent.) and the Paint, Colour and Varnish Trade (nearly 14 per cent.); among the 6 trades recording a smaller number of operatives in 1930 may be mentioned the Seed Crushing and the Petroleum Refining Trades, which showed totals lower by 23 per cent. and 20 per cent. respectively.

With the exception of the Seed Crushing, Petroleum Refining and Fertiliser, etc., Trades, each of the trades distinguished in the above table recorded larger numbers of administrative, technical and clerical staff in 1930. In the important Chemicals, Dyestuffs and Drugs Trades, the increase was particularly marked, amounting to 30 per cent. of the numbers recorded at the previous Census.

Distribution by sex.—The numbers of males and of females employed in these trades were substantially the same in both years, the proportion of males to females being in each year about 3 to 1. There was a large excess in the number of male employees in the three oil-producing or refining trades and in the Chemicals, Dyestuffs and Drugs, the Fertiliser, etc., and the Paint, Colour and Varnish Trades, but females formed an important proportion of the total staff in the remainder. The proportion of male to female employees in each year was greater in Scotland than in England and Wales.

Distribution by age.—The following table classifies by age the numbers of persons (excluding outworkers) of each class recorded as employed in the various Chemical and Allied Trades in the weeks ended 18th October, 1930 and 1924 :—

Numbers of persons (excluding outworkers) employed in the weeks ended 18th October, 1930 and 1924

Trade	Operatives				Administrative, technical and clerical staff			
	Males		Females		Males		Females	
	Under 18	Total	Under 18	Total	Under 18	Total	Under 18	Total
	No.	No.	No.	No.	No.	No.	No.	No.
Chemicals, Dyestuffs and Drugs*	1930 2,415	44,426	2,424	9,227	703	10,205	773	4,484
	1924 2,758	46,147	2,620	9,476	532	8,147	390	3,191
Fertiliser, Disinfectant, Glue, etc.*	1930 340	5,673	301	1,111	85	1,124	50	382
	1924 356	6,369	305	1,347	86	1,225	38	337
Soap, Candle and Perfumery	1930 838	10,715	2,779	8,352	257	5,134	483	2,687
	1924 1,519	11,993	3,335	10,047	361	4,975	321	2,411
Paint, Colour and Varnish*	1930 879	12,233	516	1,947	340	5,039	257	1,830
	1924 774	10,868	435	1,829	259	4,385	149	1,448
Seed Crushing	1930 147	8,873	20	242	51	1,347	35	354
	1924 223	11,617	70	332	92	1,506	26	460
Oil and Tallow*	1930 263	4,153	103	652	191	2,454	122	831
	1924 183	4,016	67	316	109	1,564	57	476
Petroleum Refining	1930 211	4,855	—	32	49	738	10	80
	1924 386	6,141	5	55	79	776	13	92
Explosives and Fireworks	1930 253	4,155	759	4,067	39	698	32	390
	1924 469	3,804	1,381	4,260	33	638	23	297
Starch and Polishes	1930 197	2,726	861	3,279	40	1,252	118	571
	1924 220	3,109	856	4,372	44	1,233	80	531
Match	1930* 60	1,372	674	2,255	6	307	11	116
	1924 89	1,555	405	2,886	7	290	4	115
Ink, Gum and Sealing Wax	1930 180	1,813	211	786	74	946	81	453
	1924 219	1,508	205	745	40	674	50	317
Unclassified Chemical Trades (Northern Ireland)†	1930 9	495	—	4	2	61	—	17
	1924 6	508	—	4	5	69	1	10
TOTAL ...	1930 5,792	101,489	8,648	31,954	1,837	29,305	1,972	12,195
	1924 7,202	107,635	9,684	35,669	1,647	25,482	1,152	9,685

* Great Britain.

† Includes the Chemicals, etc., Fertiliser, etc., Paint, etc., and Oil and Tallow Trades.

The number of young persons employed in these trades declined from 19,685 in 1924 to 18,249 in 1930, or by about 7 per cent., a decrease of 14 per cent. in the total number of young operatives being partially offset by an increase in administrative, technical and clerical employees. Female operatives under 18 years of age were employed in large numbers in the Soap, Candle and Perfumery Trades, in which they formed about one-third of all female operatives in both years; the Chemicals, Dyestuffs and Drugs Trades also

recorded a large proportion of operatives of this class. Of the total number of female operatives shown for all trades in this group, about 27 per cent. in both years consisted of employees under 18 years of age, but of the male operatives only 6 per cent. in 1930, and 7 per cent. in 1924, were of this age group.

Monthly fluctuations in employment.—Firms were required to state the actual numbers of operatives employed in the middle week of each month of the periods covered by their returns, and the following table shows the monthly aggregates for each of the trades in the chemical group:—

Operative staff (excluding outworkers) in the Chemical and Allied Trades in 1930 and 1924

Middle week in (1)	1930		1924
	Total number (2)	Number employed by firms furnishing returns in respect of the twelve months ended December* (3)	Total number (4)
January	140,962	104,737	140,572
February	140,418	103,728	141,669
March	141,102	103,411	143,812
April	140,105	102,633	145,375
May	138,507	102,290	144,261
June	135,949	100,737	142,568
July	135,527	100,260	141,788
August	134,610	99,248	142,183
September... ..	134,232	98,734	142,913
October	133,443	97,629	143,304
November	132,754	96,713	143,244
December	132,197	96,100	143,429
AVERAGE FOR THE TWELVE MONTHS	136,651	100,518	142,927

* Great Britain only.

The figures in columns (2) and (4) represent the aggregates recorded in all returns, irrespective of the periods to which they related: * thus, for example, in the case of returns covering the twelve months ended March 31st, 1931, the figures recorded in column (2) for the first three months were the numbers employed in that period of the year 1931, while the numbers at work in the last three months of the year 1929 were stated in returns covering the twelve months ended 30th September, 1930. A more accurate representation of the fluctuations in employment in the year 1930 is provided by the figures in column (3), which show the numbers recorded in returns

* See Introductory Notes, page xi.

that related to the calendar year. These figures indicate that employment declined continuously throughout 1930 though the rate of decline was not so rapid as in some other groups of trades, the total at the end of the year being about 8 per cent. lower than at the beginning.

Outworkers.—Employment of outworkers was not a factor of importance in the chemical group of trades, the only trade affected being the Match Trade, in which seven males, on the average, were recorded as employed in Great Britain in 1930 and none in 1924.

Wages

The following table summarises the information available as to the amount of wages paid by firms in the chemical group of trades in 1930 and 1924. The particulars of wages shown in column (8) are those ascertained by the Ministry of Labour as a result of the voluntary inquiries undertaken by that Ministry into wages and hours of labour in the United Kingdom.

The numbers of operatives shown in columns (1) and (3) are those returned to the Census of Production as employed by the firms concerned in the weeks ended 18th October, 1930 and 1924, and the average during the year 1930 respectively. The amount of wages paid shown in column (8) is the aggregate returned to the Ministry of Labour in respect of the same firms. The proportion of each trade represented by the firms that furnished particulars of their wage bills is shown in columns (2) and (4) based on the numbers of operatives employed and, in column (7), on net output. The average numbers of operatives employed during the year 1924, corresponding to those given in column (3) in respect of 1930, are not available.

The figures for wages for both years relate to firms employing on an average more than ten persons during the respective years and cover firms in Great Britain only.

Trade	Firms furnishing				
	Operative staff employed				
	During week ended 18th October (1)	Proportion of trade (2)	Average during year (3)	Proportion of trade (4)	
	No.	Per cent.	No.	Per cent.	
Chemicals, Dyestuffs and Drugs	1930	39,610	73.8	42,799	76.7
	1924	37,734	67.6	§	—
Fertiliser, Disinfectant, Glue, etc.	1930	4,598	67.8	4,840	68.7
	1924	3,793	49.2	§	—
Soap, Candle and Perfumery	1930	14,637	77.4	14,707	77.3
	1924	15,882	72.7	§	—
Paint, Colour and Varnish	1930	7,620	53.5	7,669	53.2
	1924	6,868	54.1	§	—
Seed Crushing	1930	7,741	84.9	7,933	85.4
	1924	11,726	98.1	§	—
Oil and Tallow	1930	2,156	44.9	2,054	42.8
Petroleum Refining	1930	2,285	46.8	2,217	46.1
Oil, Tallow and Petroleum Refining†	1930	4,441	45.8	4,271	44.5
	1924	6,887	65.4	§	—
Explosives and Fireworks... ..	1930	5,054	61.5	5,234	62.3
	1924	6,200	76.9	§	—
Starch and Polishes	1930	3,581	59.6	3,672	59.8
	1924	5,375	71.8	§	—
Match	1930	3,234	89.2	3,249	90.4
	1924‡	4,203	94.6	§	—
Ink, Gum and Sealing Wax	1930	1,358	52.3	1,372	52.2
	1924	1,522	67.6	§	—
TOTAL	1930	91,874	69.2	95,746	70.4
	1924	100,190	70.2	§	—

† Separate particulars for the Oil and Tallow and the Petroleum Refining Trades are not available for the year 1924.

‡ In order to avoid disclosure of information relating to individual firms, these particulars relate to the United Kingdom as a whole.

returns of wages					Trade
Gross output	Net output		Wages paid		
	Amount	Proportion of trade	Amount	Proportion of net output	
(5)	(6)	(7)	(8)	(9)	
£'000	£'000	Per cent.	£'000	Per cent.	
36,349	17,022*	68.1	6,372	37.4	1930 } Chemicals, Dyestuffs and Drugs.
§	14,449*	62.1	5,396	37.3	1924 } Fertiliser, Disinfectant, Glue, etc.
3,859	1,747	67.2	618	35.4	1930 } Soap, Candle and Perfumery.
§	1,478	53.3	514	34.8	1924 } Paint, Colour and Varnish.
23,939	9,984	77.6	1,929	19.3	1930 } Seed Crushing.
§	9,292	75.6	1,953	21.0	1924 } Oil and Tallow.
10,060	4,375	50.7	1,040	23.8	1930... Petroleum Refining.
§	3,982	54.2	942	23.6	
17,166	1,853	76.7	1,093	59.0	1930 } Oil, Tallow and Petroleum Refining.†
§	3,826	97.9	1,728	45.2	1924 } Explosives and Fireworks.
6,147	1,572	31.8	279	17.7	1930 } Starch and Polishes.
7,764	2,670*	46.7	416	15.6	1924 } Match.
13,911	4,242*	39.8	695	16.4	1930 } Ink, Gum and Sealing Wax.
§	3,728	63.2	1,112	29.8	1924 } ... TOTAL.
3,708	2,270	75.6	643	28.3	
§	2,322	82.8	627	27.0	
3,690	2,286	57.1	421	18.4	
§	3,018	74.8	579	19.2	
4,081	1,431*	96.5	360	25.2	
§	1,693*	98.2	474	28.0	
1,809	1,020	50.9	203	19.9	
§	1,151	74.3	211	18.3	
118,572	46,230*	63.6	13,374	28.9	
§	44,939*	67.8	13,536	30.1	

* Excluding estimated Excise duty.

§ Details not available.

The proportion of the total trade that was covered by firms whose wages returns are included in the above table was smaller by 1.0 per cent. in 1930 measured by the number of operatives employed, and by 4.2 per cent. measured by net output. In each year the proportion of the total employment represented by the sample was greater than that of the total net output and the average net output per employee of the firms whose wages returns are included was thus smaller than in the case of the excluded firms.

In the group as a whole the wages bill formed a slightly lower proportion of the total net output in 1930 than in 1924 but substantial changes are shown in individual cases, notably those concerned in the production of oil. In the Seed Crushing Trade, the proportion of wages increased from 45.2 per cent. of the net output in 1924 to 59 per cent. in 1930, being higher in both years than in any other of the specified trades; in the combined Oil and Tallow and Petroleum Refining Trades there was a relatively heavy decline in the wages proportion, but the sample covered by the wages enquiry in 1930 was small and may not have been representative. The proportionately lower wages costs indicated in the Oil and Tallow and Petroleum Refining Trades and also in the Soap, Candle and Perfumery and certain other trades may be associated with the relatively higher selling expenses, including advertising costs, which have already been referred to (see page 242).

The average earnings per operative in the case of the firms covered by the table amounted to £140 in 1930. In 1924 the number of operatives employed in the week ended 18th October by all firms in this group approximated very closely to the average for the year and, on the assumption that there was a similar agreement as regards the firms furnishing wages returns, the average earnings per operative in 1924 may be estimated as about £135. In the Chemicals, Dyestuffs and Drugs Trades the figures given for net output may be affected to some extent owing to the absence of information which would enable the amount of medicine stamp duty paid by each of the firms manufacturing drugs to be estimated with precision. In the other trades affected by excise duties, the figures for net output may be taken as substantially correct.

Power

The particulars recorded at the Censuses of 1930 and 1924 in respect of power installed and employed in the chemical group of trades are shown in the following table:—

Power ordinarily in use and not in use in the Chemical and Allied Trades in 1930 and 1924

Type	Capacity ordinarily in use		Capacity in reserve or idle		Proportion in reserve or idle	
	1930	1924	1930	1924	1930	1924
	Th. H.P.	Th. H.P.	Th. H.P.	Th. H.P.	Per cent.	Per cent.
PRIME MOVERS						
Reciprocating steam engines	102.7	153.5	41.0	46.6	28.6	23.3
Steam turbines	199.2	45.7	179.3	33.7	47.4	42.5
Internal combustion engines:—						
Gas	13.1	21.9	2.0	32.1	13.1	59.4
Petrol, kerosene, or other light oils ...	0.7	2.5	0.9	0.4	57.1	13.6
Heavy oils	6.9	1.6	2.7	1.8	27.7	52.9
Water engines	5.2	2.2	1.6	—	23.7	—
Other	0.1	—	—	—	—	—
TOTAL—Prime movers	327.9	227.4	227.5	114.6	41.0	33.5
ELECTRIC GENERATORS						
Driven by	Th. Kw.	Th. Kw.	Th. Kw.	Th. Kw.		
Reciprocating steam engines	26.9	28.0	13.2	20.5	32.9	42.2
Steam turbines	110.5	33.4	79.4	24.7	41.8	42.6
Internal combustion engines:—						
Gas	3.3	5.6	0.7	21.6	17.4	79.3
Petrol, kerosene, or other light oils ...	0.1	0.2	0.3	*	64.2	14.3
Heavy oils	2.2	0.4	1.6	1.1	42.4	74.3
Water engines	2.7	0.1	1.2	—	31.9	—
TOTAL—Electric generators	145.7	67.7	96.4	67.9	39.8	50.1
ELECTRIC MOTORS						
Driven by	Th. H.P.	Th. H.P.	Th. H.P.	Th. H.P.		
Electricity generated in same works ...	165.9	89.1	59.3	32.1	26.3	26.5
Electricity generated in other works under same ownership ...	6.4	3.0	2.4	—	27.3	—
Purchased electricity	226.4	133.0	70.5	28.2	23.7	17.5
TOTAL—Electric motors	398.7	225.1	132.2	60.3	24.9	21.1

* Less than 50 kw.

The power generated by prime movers is required partly for direct application and partly for driving generators for the production of electrical energy. The electrical energy so produced may be used either for the purpose of driving electric motors or for heating, lighting and process purposes. Particulars of the power applied mechanically (i.e. directly) and electrically are given in the table on page 258.

There was a substantial increase in the electric motor equipment in this group of trades in 1930, the capacity being greater by 77 per cent. than in 1924 in the case of all motors in use and by nearly 120 per cent. for motors in reserve. The more than four-fold increase in steam turbines in use is due in the main to the marked increase in electric generators and in the capacity of motors driven by the electricity so generated. On the other hand, the total horsepower of reciprocating steam engines in use declined in 1930 by one-third.

At the 1930 Census, firms were definitely informed that obsolete engines should not be recorded in their returns, and as no similar instruction was given at the previous Census, the figures for reserve or idle plant in the two years may not be precisely comparable. In any case, however, the proportion of reserve or idle plant does not furnish a reliable measure of the activity of trade, since all engines that were in operation during the greater part of the period in which production was carried on were recorded as "ordinarily in use", irrespective of intermittent working.

The particulars furnished at the two Censuses by each of the trades included in the chemical and allied group, in respect of prime movers, electric generators and electric motors installed, are shown in the following table:—

Power available in 1930 and 1924

Trade	Prime movers	Electric generators	Electric motors			All electric motors	
			Driven by electricity				
			Generated in same works	Generated in other works under same ownership	Purchased		
	Thous. H.P.	Thous. Kw.	Thous. H.P.	Thous. H.P.	Thous. H.P.	Thous. H.P.	
Chemicals, dyes and drugs*	1930	389.8	162.5	131.0	2.1	147.1	280.2
	1924	165.4	69.4	50.7	—	66.3	117.0
Fertiliser, disinfectant, etc.*	1930	11.8	4.1	7.1	0.1	23.4	30.6
	1924	15.6	3.7	4.2	†	18.6	22.8
Soap, Candle and Perfumery	1930	41.4	25.1	18.9	—	16.4	35.3
	1924	24.3	9.0	8.2	3.0	9.8	21.0
Paint, Colour and Varnish*	1930	12.9	3.1	3.9	—	39.2	43.1
	1924	13.5	3.0	2.9	—	23.0	25.9
Seed Crushing	1930	34.8	11.3	15.2	3.4	32.8	51.4
	1924	50.5	15.0	18.0	—	23.0	41.0
Oil and Tallow*	1930	6.8	3.4	2.6	1.6	7.8	12.0
	1924	5.7	0.9	1.0	—	4.0	5.0
Petroleum Refining ...	1930	34.3	20.0	25.9	0.3	8.9	35.1
	1924	42.5	23.9	21.0	—	4.6	25.6
Explosives and Fireworks	1930	12.7	7.8	14.4	—	3.6	18.0
	1924	13.7	6.6	10.7	—	1.2	11.9
Starch and Polishes	1930	1.8	0.5	0.1	1.3	8.6	10.0
	1924	2.7	0.4	0.5	—	6.1	6.6

Trade	Prime movers	Electric generators	Electric motors			All electric motors	
			Driven by electricity				
			Generated in same works	Generated in other works under same ownership	Purchased		
	Thous. H.P.	Thous. Kw.	Thous. H.P.	Thous. H.P.	Thous. H.P.	Thous. H.P.	
Match‡ ...	1930	4.5	2.5	3.3	—	0.4	3.7
	1924	5.0	2.5	2.6	—	0.4	3.0
Ink, Gum and Sealing Wax ...	1930	2.7	0.8	1.0	†	8.4	9.4
	1924	1.7	0.3	0.2	—	4.0	4.2
Unclassified Chemical Trades (Northern Ireland)§ ...	1930	1.9	1.0	1.8	—	0.3	2.1
	1924	1.4	0.9	1.2	—	0.2	1.4
TOTAL—UNITED KINGDOM† ...	1930	555.4	242.1	225.2	8.8	296.9	530.9
	1924	342.0	135.6	121.2	3.0	161.2	285.4
England and Wales‡ ...	1930	514.1	222.1	197.2	8.8	274.6	480.6
	1924	292.6	111.8	98.4	3.0	144.3	245.7
Scotland ...	1930	39.1	19.0	26.2	†	22.0	48.2
	1924	47.8	22.9	21.5	—	16.7	38.2
Northern Ireland‡ ...	1930	2.2	1.0	1.8	—	0.3	2.1
	1924	1.6	0.9	1.3	—	0.2	1.5

* Great Britain. † Less than 50 H.P.

‡ See footnote (§) to table on page 238.

§ Includes the Chemicals, etc., Fertiliser, etc., Paint, etc., and Oil and Tallow Trades.

Total power in use.—The figures in the following table represent the estimated amount of power actually employed by each of the Chemical and Allied Trades in the two years. For the purpose of arriving at the power applied mechanically, the capacity of the prime movers required to drive electric generators has been calculated and deducted from the total capacity of the prime movers; the power applied electrically represents the capacity of electric motors driven by generators at firms' works added to that of motors driven by purchased electricity. As the basis for calculating the amount of the primary power that is converted into electrical energy, 746 kilowatts of electrical energy have been taken as equivalent to 1,000 horse-power of primary power and an average loss of ten per cent. in transmission has been allowed except for steam turbines, in which the loss is negligible. The power capacity recorded as "ordinarily in use" has been taken as the basis of the calculation in all cases.

The horse-power of motors designed to be driven by electricity generated in the same works may be greater than that of the prime movers used (or calculated in this manner to have been necessary) to drive them, since machines required for special processes are frequently equipped with individual motors which will only be in

use on those occasions when the need for those processes arises. Further, the capacity measurement which firms were instructed to state was the effective horse-power which their engines could develop and this measurement does not necessarily represent the capacity at which the engines were normally operated. For these reasons, the figures given below should not be taken as providing more than a rough indication of the actual amount of power employed by any trade or of the degree of its electrification.

Power in use in 1930 and 1924

Trade		Power applied mechanically	Power applied electrically	Total power	Per head of average number of operatives employed	
		Th. H.P.	Th. H.P.	Th. H.P.	H.P.	
1	Chemicals, Dyestuffs and Drugs*	1930	84.1	180.4	264.5	4.7
		1924	54.8	89.0	143.8	2.6
2	Fertiliser, Disinfectant, Glue, etc.*	1930	4.1	25.9	30.0	4.3
		1924	7.8	20.8	28.6	3.5
3	Soap, Candle and Perfumery	1930	5.5	33.3	38.8	2.0
		1924	13.4	19.1	32.5	1.5
4	Paint, Colour and Varnish*	1930	7.8	39.6	47.4	3.3
		1924	8.1	23.0	31.1	2.4
5	Seed Crushing	1930	14.8	45.5	60.3	6.5
		1924	27.6	32.0	59.6	4.9
6	Oil and Tallow*	1930	1.3	10.3	11.6	2.4
		1924	3.7	4.7	8.4	2.0
7	Petroleum Refining	1930	4.4	26.4	30.8	6.4
		1924	8.4	13.6	22.0	3.6
8	Explosives and Fireworks	1930	1.7	14.7	16.4	1.9
		1924	3.6	9.5	13.1	1.7
9	Starch and Polishes	1930	1.1	8.8	9.9	1.6
		1924	2.0	5.9	7.9	1.1
10	Match	1930*	0.9	3.3	4.2	1.2
		1924	0.9	2.4	3.3	0.8
11	Ink, Gum and Sealing Wax	1930	1.1	8.9	10.0	3.8
		1924	1.0	3.9	4.9	2.2
	Unclassified Chemical Trades (Northern Ireland)†	1930	0.4	1.6	2.0	3.7
		1924	0.2	1.2	1.4	2.4
TOTAL		1930	127.2	398.7	525.9	3.8
		1924	131.5	225.1	356.6	2.5

* Great Britain.

† Includes the Chemicals, etc., Fertiliser, etc., Paint, etc., and Oil and Tallow Trades.

An increase in the power used per operative is shown for each of the trades in this group, amounting for the group as a whole to over 50 per cent. This large increase was due entirely to development of electrical sources of power, a slight decrease (3 per cent.) being shown in the amount of power applied mechanically. In each trade the power applied electrically increased to a marked degree, but in a number of trades there was a substantial decline in power applied mechanically, offsetting the large increase in such power in the Chemicals, Dyestuffs and Drugs Trades, in which the increase in the total power equipment was particularly striking.

Consumption of fuel

Coal and coke.—At the 1930 Census, all firms were required to state the total quantity of coal and coke used for generating power (i.e., for driving engines), and were also requested to furnish particulars of the amounts used for other purposes on a voluntary basis, as the provisions of the Census of Production Act do not enable the latter to be obtained compulsorily. In the Chemical and Allied Trades, where heat is required for process purposes as well as for power, some firms found difficulty in furnishing a trustworthy figure of the quantities used for these two categories separately, and, as appears from the table below, it was necessary to accept a certain number of inclusive quantity statements without distinction as to purpose. The following particulars relate only to firms in Great Britain.

Coal and coke used

Note.—The figures in italics below the name of the trade represent respectively (1) the percentage of the total capacity of steam engines in use represented by the firms that furnished separate particulars of coal and coke used for power and (2) the percentage of the total net output represented by the firms that furnished separate particulars of coal and coke used for other purposes.

Trade	For power		For other purposes		Unclassified	
	Coal	Coke	Coal	Coke	Coal	Coke
	Th. tons	Th. tons	Th. tons	Th. tons	Th. tons	Th. tons
Chemicals, Dyestuffs and Drugs—						
(1) <i>98.0</i> ; (2) <i>96.9</i> ...	818.5	12.3	1,417.1	354.7	8.6	30.4
Fertiliser, Disinfectant, Glue, etc.—						
(1) <i>94.0</i> ; (2) <i>81.9</i> ...	37.2	0.2	108.4	5.6	9.5	0.1
Soap, Candle and Perfumery—						
(1) <i>99.3</i> ; (2) <i>95.6</i> ...	74.6	3.1	283.3	8.0	6.5	*
Paint, Colour and Varnish—						
(1) <i>100.0</i> ; (2) <i>95.9</i> ...	35.0	1.9	71.5	16.5	—	—
Seed Crushing—						
(1) <i>95.5</i> ; (2) <i>85.9</i> ...	105.6	0.6	101.5	11.7	3.7	0.1
Oil and Tallow—						
(1) <i>97.5</i> ; (2) <i>73.7</i> ...	35.3	1.4	69.5	5.0	2.5	0.3
Petroleum Refining—						
(1) <i>100.0</i> ; (2) <i>88.5</i> ...	159.3	2.2	213.0	22.2	—	—
Explosives and Fireworks—						
(1) <i>99.2</i> ; (2) <i>62.1</i> ...	24.6	—	20.7	1.1	2.5	—
Starch and Polishes—						
(1) <i>76.7</i> ; (2) <i>83.0</i> ...	13.0	0.1	29.3	3.9	3.0	*
Match—						
(1) <i>100.0</i> ; (2) <i>100.0</i> ...	2.3	—	10.6	0.5	—	—
Ink, Gum and Sealing Wax—						
(1) <i>78.0</i> ; (2) <i>99.3</i> ...	3.5	0.1	3.2	1.7	1.4	—
TOTAL—						
(1) <i>97.9</i> ; (2) <i>91.6</i> ...	1,308.9	21.9	2,328.1	430.9	37.7	30.9

* Less than 50 tons.

On the basis of the particulars received, it may be estimated that the total consumption for power purposes in 1930 was about 1,340,000 tons of coal and 22,000 tons of coke.

No particulars of oil, gas or other fuel used were ascertained for the year 1930. At the Census of 1924, a voluntary inquiry was made as to the amounts of coal, coke, heavy and light oils, and gas consumed, and reference should be made to the Final Report on that Census for particulars of the partial information supplied by each of the Chemical and Allied Trades.

Electricity.—Particulars of the quantity of electricity used were required from all firms, electricity produced by their own generating plant being distinguished from that purchased from outside sources. No separate record of the purpose for which current was used was obtained.

The following table shows for each of the Chemical and Allied Trades the total quantities of electricity used in 1930 :—

Electricity used

Trade	Electricity purchased	Electricity generated		Number of units generated per kilowatt of generators in use
		In same works	In other works owned by the firm	
	B.T.U. (Kw.-hrs.) '000	B.T.U. (Kw.-hrs.) '000	B.T.U. (Kw.-hrs.) '000	B.T.U. per Kw.
Chemicals, Dyestuffs and Drugs	240,451	359,950	20,894	3,778
Fertiliser, Disinfectant, Glue, etc.	15,112	5,139	420	1,591
Soap, Candle and Perfumery ...	9,102	21,499	—	1,397
Paint, Colour and Varnish ...	23,061	3,168	—	1,619
Seed Crushing	30,480	21,529	3,627	2,928
Oil and Tallow	6,200	3,051	10,429	980
Petroleum Refining	2,325	42,533	22	3,532
Explosives and Fireworks ...	2,074	11,087	—	2,826
Starch and Polishes	5,755	697	1,300	2,492
Match	249	2,240	—	1,258
Ink, Gum and Sealing Wax ...	4,160	383	13	710
TOTAL	338,969	471,276	36,705	3,253

The figures shown for current generated represent only the amounts generated *and used*, and fall short of the total output of current in cases where electricity was sold to outside consumers.