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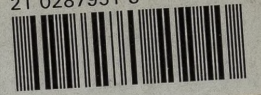


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CENSUS OF PRODUCTION.

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# FINAL REPORT

ON THE

## FIRST CENSUS OF PRODUCTION OF THE UNITED KINGDOM (1907).

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WITH TABLES.

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Presented to both Houses of Parliament by Command of His Majesty.

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To the SECRETARY OF THE BOARD OF TRADE.

SIR,

I HAVE the honour to present herewith a series of revised Tables summarising the results of the Returns received under the Census of Production Act, 1906, together with a Report on the whole Census and Reports on the various trades by the Director of the Census.

The Census was taken in the year 1908 in respect of the year 1907, and, although, in cases where the business year of firms was not the calendar year, they were permitted to make Returns for the business year most closely corresponding thereto, it is believed that the Returns received are in the aggregate substantially representative of the production of the year 1907.

In the course of the years 1909-11 nine Reports were published containing Preliminary Tables summarising the information furnished. These Tables have been carefully revised, and, in addition to the information included in them, particulars are now given relating to the kind and capacity of engines and dynamos owned and the quantity of electricity generated or purchased in each trade.

The various trades have been classed in thirteen groups, viz. :—mines and quarries ; iron, steel, engineering, and shipbuilding trades ; metal trades, other than iron and steel ; textile trades ; clothing trades ; food, drink, and tobacco trades ; chemical and allied trades ; paper, printing, stationery, and allied trades ; leather, canvas, and india-rubber trades ; timber trades ; clay, stone, and building trades ; miscellaneous trades ; and public utility services. Production carried on in various Government establishments (such as the Royal Dockyards) is generally dealt with in the group to which it is most nearly allied, but the work done by local authorities, by gas, water, and electricity undertakings, by canal, harbour, dock, tramway, and other companies, and by certain Government Departments, is classed under public utility services.

To each group is prefixed a General Report summarising the main features of the information furnished respecting the trades comprised in the group, and showing, wherever possible, the total output of the group free from duplication. The net output of the trades in the group is shown separately for factories and workshops, and the particulars voluntarily supplied as to fuel consumption are also summarised. The Reports respecting individual trades, included with the series of Preliminary Tables, have been carefully revised and much expanded so as to show as far as possible the complete output of finished goods, whether returned on the Schedules for the trades in which they are chiefly manufactured or on the Schedules for other trades. Estimates, based partly on information furnished voluntarily by manufacturers, partly on other information in the possession of the Census of Production Office, have also been incorporated regarding the total make of important semi-manufactured products, such as pig iron, steel, yarns, &c. An attempt has also been made to show the value of the total output of each trade, taken as a whole and free from duplication. The particulars furnished voluntarily respecting the machinery equipment of certain trades are also summarised in the Reports on those trades.

The results of the Census of Production, so far as they relate to the industries dealt with in the Census of Production Office, are shown in summary form in the following Table :—

	Gross Output. Selling Value or Value of Work Done.	Materials Used. Cost.	Work Given Out. Amount Paid to other Firms.	Net Output. Excess of Column (1) over Columns (2) and (3).	Persons Employed (except Outworkers).	Net Output per Person employed (excluding Outworkers).	Horse-Power of Engines at Factories, Mines, &c.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	£ million.	£ million.	£ million.	£ million.		£	H.-P.
England and Wales ...	1,490	868	19	603	5,808,269	104	9,097,869
Scotland ...	208	117	5	86	885,403	98	1,397,733
Ireland ...	67	43	1	23	291,304	78	259,407
United Kingdom ...	1,765	1,028	25	712	6,984,976	102	10,755,009

About one-quarter of the total engine-power was required for driving dynamos for the production of electricity for power and lighting purposes.

ERRATA.

- Page vii. line 28. For "Eur" read "Fur."
- " 8 " 28. For "1191" read "1911."
- " 40 " 9. For "733,000" read "773,000."
- " 60 " 27. For "(or 31½ per cent. of the total) returned to the Census Office" read "(or 31¼ per cent. of the total returned to the Census Office)".
- " 105, last line of Table. For "Joints" read "Joists."
- " 130. Table. "Steam Engines, Other Descriptions—Production" should read "6,443,000½."
- " 165. " For "7,212" read "7,502" and for "7,878" read "8,168."
- " 167 line 20. For "249,200" read "244,200."
- " 242 " 27. For "19,600" read "9,600."
- " 286 " 41. For "Linen and Yarns" read "and Linen Yarns."
- " " 53. For "245,542,000" read "245,982,000."
- " 319 " 55. For "taken as a whole, the" read "taken as a whole, in the."
- " 328 " 27. For "employed in the censal year" read "employed (exclusive of outworkers) in the censal year."
- " 335 " 26. For "internal combustion engines" read "reciprocating steam engines."
- " 447 " 35. For "4,080,000" read "1,080,000."
- " 564 " 35. For "excluding" read "including."
- " 759 " 50. For "40,383" read "40,783."
- " 835 " 17. For "1,411,486" read "1,411,496."
- " 927 Index. "Benzol and Toluol." For "527" read "547."
- " 930 " "Dyeing of Garments." For "376-9" read "436-40,"  
"Dyeing of Textile Goods." For "436-40" read "376-9."
- " 932 " "Laces, Leather." Insert pages—Reports, 396, 658. Tables, 419, 675.



The average number of persons employed by all the firms that made Returns to the Census of Production Office was about 7,100,000 (including about 100,000 outworkers), and the highest aggregate number shown for any of the four dates for which Returns were received was about 7,250,000, these figures including about 500,000 employers and salaried persons; it should be noted, however, that many small employers returned themselves as wage-earners. It is estimated that Returns were not furnished in respect of the output of about 1 to 1½ million persons whose occupations came within the scope of the Census of Production. They were chiefly employed in the clothing, boot and shoe, laundry, and building trades, either on their own account or in workshops where only men are employed or which are confined to members of a family, and their net output probably did not exceed £50,000,000, which should accordingly be added to the sum of £712,000,000 shown above in order to represent completely the net output of the industries covered by the Census.

The Census of Production Office did not extend its inquiries to Agriculture and Fisheries, but voluntary inquiries respecting the agricultural output were conducted by the Board of Agriculture and Fisheries for Great Britain and by the Department of Agriculture and Technical Instruction for Ireland. These inquiries show that the agricultural output of Great Britain, as reported to the Board of Agriculture and Fisheries, was valued at £150,800,000, about 1,840,000 persons being permanently or temporarily employed in its production, and that the agricultural output of Ireland, as reported to the Irish Department of Agriculture and Technical Instruction, was valued at £45,574,000, affording permanent or temporary employment to about 984,000 persons. The Reports of the Board of Agriculture and Fisheries, the Fishery Board for Scotland, and the Department of Agriculture and Technical Instruction for Ireland show that the value of the fresh fish and shell-fish landed in the United Kingdom in 1907 was about £11,718,000, the number of persons employed regularly or occasionally being about 107,000.

A General Report reviewing the results of the Census as a whole is prefixed to the series of group Reports. In the introduction to this General Report the instructions and explanations given to manufacturers and others who were required to make Returns are summarised, and there follow sections dealing with "net output," "persons employed," "net output per head of persons employed," "the power equipment of industry," and "production in the several divisions of the United Kingdom." An attempt is then made to gather together all the information furnished respecting the various industries, including agriculture and fishery, and to form an estimate of the value of the output of the United Kingdom in 1907, taken as a whole, and free from the duplication which affects the aggregate figures of gross output owing to the inclusion in the output of certain firms of products which, serving as materials for certain other firms, have their value duplicated in that of the output of these latter. The extent of the duplication cannot be stated with precision, but, after making the best estimates available, there is shown for the value of the output of the United Kingdom, taken at the point where the agricultural, mining, manufacturing, or other processes are completed and distribution for final consumption or export begins, a sum between £1,433,000,000 and £1,448,000,000. Deducting exported goods, there remain for consumption in the United Kingdom goods of a value between £1,003,000,000 and £1,033,000,000. The imports into the United Kingdom in 1907 (after deducting re-exports) included goods which appear to have passed into consumption without further manufacture valued at the port of landing at £232,000,000 (including duties). It is further roughly estimated, on the basis of inquiries that have been made, that from £428,000,000 to £563,000,000 have to be added to the value of goods at the factory or the port of entry in order to cover the expenses and profits of distribution and transport before they reach the hands of the consumer. The total value of all the goods consumed in 1907 in the United Kingdom (including, as consumed, goods converted into fixed forms such as buildings or machinery) thus appears to lie between £1,663,000,000 and £1,833,000,000.

The goods represented by this total of somewhat over 1,700 million pounds sterling were not all available for immediate personal consumption, since, in order that production might continue on a permanent basis, provision had to be made for the maintenance of plant and other forms of capital. The sum required for that purpose is roughly estimated at between £170,000,000 and £180,000,000, including from £75,000,000 to £85,000,000 for the maintenance of the mining, manufacturing, and building capital of the country. That capital is estimated to have been about £1,500,000,000 in 1907. A deduction for the necessary maintenance and replacement of capital being made, the remainder of the £1,700,000,000 represents the total income of those classes whose services in production, distribution, and transport are represented by the value of the goods produced. There

are, however, other classes of the community, such as doctors, lawyers, and domestic servants, who do not produce material goods but acquire them in exchange for services. The total income of the country is made up of the value of the goods consumed or saved and of services, not embodied in material goods, rendered by some of its inhabitants to others for payment. It is estimated for 1907 at about 2,000 million pounds sterling, of which a sum lying between 320 and 350 millions sterling served to provide for additions to stocks of durable goods for personal enjoyment (such as furniture or jewellery), and for new capital investments at home or abroad. Comparing the net output (£712,000,000) of the industries dealt with in Returns made to the Census of Production Office, after allowing for renewals of plant, &c., with this estimate of the total income of the United Kingdom, it would appear that the values created by those industries form about one-third of the available income of the country. It must be borne in mind that such of the preceding figures as are based upon other material than that contained in the Returns made to the Census of Production Office should only be used subject to any qualifications set forth in the Report. The main conclusions are believed to lie within a range from which gross inaccuracy is excluded.

The Schedules returned to the Census of Production Office were, on the whole, filled up in a satisfactory manner, and, where it appeared that instructions had not been correctly interpreted, the difficulties which resulted were adjusted by correspondence with the firms concerned. The differences between the figures given in the Preliminary Tables and those now submitted are, in the main, due to the fact that it was necessary to prepare the Preliminary Tables before such correspondence was complete. It is believed that the Census has covered all employers except those whose operations were on a very small scale or of extreme irregularity.

Where the answers furnished to the voluntary questions included in certain of the Schedules were sufficiently complete, they have been utilised for the purposes for which they were framed.

The initial organisation of the Census of Production inquiry was carried out by the late Mr. D. F. Schloss, and its completion, together with the issue and receipt of the Schedules for the First Census, was effected under the charge of Mr. H. Fountain, who acted as Director for a period of nearly three years following the retirement of Mr. Schloss in 1908. Mr. Fountain was succeeded in 1911 by Mr. A. W. Flux, the present Director. I consider that the whole staff are entitled to much credit for the zeal and ability they have shown throughout the work, and the way in which they have met the difficulties incidental to a new organisation and to the collection of information of a novel character.

It may be added that the arrangements for the Second Census, which will relate to the production of the year 1912, have reached an advanced stage, and it is expected that the Schedules will be issued early in the new year.

I have the honour to be,

Sir,

Your obedient Servant,

GEORGE STAPYLTON BARNES.

Labour Department,  
Board of Trade,  
3rd December, 1912.



CONTENTS.

	PAGE
SECTION I.—GENERAL REPORT BY THE DIRECTOR OF THE CENSUS:	
INTRODUCTION ... ..	1
Output, 2; Materials Used, 4; Work Given Out, 5; Persons Employed, 5; Days Worked, 6; Engines and Electricity, 6; Voluntary Questions, 7.	
NET OUTPUT ... ..	7
PERSONS EMPLOYED ... ..	8
NET OUTPUT PER HEAD OF PERSONS EMPLOYED ... ..	12
THE POWER EQUIPMENT OF INDUSTRY ... ..	15
PRODUCTION IN THE SEVERAL DIVISIONS OF THE UNITED KINGDOM ... ..	18
THE OUTPUT OF THE UNITED KINGDOM TAKEN AS A WHOLE ... ..	21
PRODUCTION, CONSUMPTION, AND INCOME OF THE UNITED KINGDOM ... ..	30
NOTE ON CAPITAL EMPLOYED IN THE UNITED KINGDOM IN INDUSTRIES COVERED BY THE CENSUS OF PRODUCTION ... ..	35
DETAILED REPORTS AND TABLES:	
SECTION II.—MINES AND QUARRIES:—	
GENERAL REPORT ... ..	38
COAL AND IRONSTONE MINES UNDER THE COAL MINES REGULATION ACTS ... ..	42
COKE WORKS AT COLLIERIES ... ..	45
MANUFACTURED FUEL TRADE ... ..	47
OIL SHALE MINES ... ..	49
SHALE OIL WORKS ... ..	50
IRON MINES UNDER THE METALLIFEROUS MINES REGULATION ACT AND IRON QUARRIES ... ..	51
MINES, OTHER THAN COAL AND IRON ... ..	53
SALT MINES, BRINE PITS, AND SALT WORKS ... ..	56
SLATE QUARRIES ... ..	58
LIMESTONE QUARRIES AND LIME KILNS ... ..	60
QUARRIES, OTHER THAN IRON, SLATE, AND LIMESTONE ... ..	62
SECTION III.—IRON AND STEEL, ENGINEERING, AND SHIP- BUILDING TRADES:—	
GENERAL REPORT ... ..	92
IRON AND STEEL TRADES (SMELTING, ROLLING, AND FOUNDED) ... ..	100
TINPLATE TRADE ... ..	108
WROUGHT IRON AND STEEL TUBE TRADE ... ..	111
WIRE TRADES ... ..	113
ANCHOR, CHAIN, NAIL, BOLT, SCREW, AND RIVET TRADES ... ..	117
GALVANISED SHEET, HARDWARE, HOLLOW-WARE, TINNED AND JAPANNED GOODS, AND BEDSTEAD TRADES ... ..	121
ENGINEERING TRADES (INCLUDING ELECTRICAL ENGINEERING) ... ..	125
SHIPBUILDING AND MARINE ENGINEERING TRADES:—	
(a) PRIVATE FIRMS ... ..	133
(b) GOVERNMENT YARDS AND LIGHTHOUSE AUTHORITIES ... ..	138
CYCLE AND MOTOR TRADES ... ..	139
CUTLERY TRADES ... ..	143
TOOL AND IMPLEMENT TRADES ... ..	146
BLACKSMITHING TRADE ... ..	150
NEEDLE, PIN, FISH-HOOK AND BUTTON TRADES ... ..	152
LOCK AND SAFE TRADES ... ..	155
SMALL ARMS TRADES ... ..	157
HEATING, LIGHTING, VENTILATING, AND SANITARY ENGINEERING TRADES ... ..	159
RAILWAY CARRIAGE AND WAGON TRADES ... ..	162
RAILWAYS (CONSTRUCTION, REPAIR, AND MAINTENANCE OF PER- MANENT WAY, ROLLING STOCK, PLANT, ETC.) ... ..	165
ROYAL ORDNANCE FACTORIES ... ..	168
NAVAL ORDNANCE DEPARTMENT ... ..	170
SECTION IV.—METAL TRADES, OTHER THAN IRON AND STEEL:—	
GENERAL REPORT ... ..	238
COPPER AND BRASS TRADES (SMELTING, ROLLING, AND CASTING) ... ..	242
FINISHED BRASS TRADES ... ..	247
GOLD AND SILVER REFINING TRADE ... ..	249
LEAD, TIN, ZINC, AND OTHER METAL TRADES (EXCEPT IRON, COPPER, BRASS, GOLD AND SILVER) ... ..	251
PLATE AND JEWELLERY TRADES ... ..	256
WATCH AND CLOCK TRADES ... ..	261

DETAILED REPORTS AND TABLES—continued.

SECTION V.—TEXTILE TRADES:—

	Report.	Tables.
	PAGE	PAGE
GENERAL REPORT ... ..	284	—
COTTON TRADE ... ..	288	337
WOOLLEN AND WORSTED TRADES ... ..	294	342
JUTE, HEMP, AND LINEN TRADES ... ..	303	348
SILK TRADES ... ..	310	358
LACE TRADES ... ..	315	361
HOSIERY TRADES ... ..	318	364
ELASTIC WEBBING TRADES ... ..	322	367
COCOANUT FIBRE, HORSEHAIR, FEATHER, AND SUNDRY VEGETABLE FIBRE TRADES ... ..	324	369
ROPE, TWINE, AND NET TRADES ... ..	327	371
FLOCK AND RAG TRADES ... ..	329	374
BLEACHING, DYEING, PRINTING, AND FINISHING TRADES ... ..	331	376
FLAX-SCUTCHING TRADE ... ..	334	380
VELVET AND FUSTIAN CUTTING TRADE ... ..	335	382

SECTION VI.—CLOTHING TRADES:—

GENERAL REPORT ... ..	386	—
CLOTHING, HANDKERCHIEF, AND MILLINERY TRADES:—		
(a) PRIVATE FIRMS AND COMPANIES ... ..	390	415
(b) ROYAL ARMY CLOTHING FACTORY ... ..	395	418
BOOT AND SHOE TRADES ... ..	396	419
HAT, BONNET, AND CAP TRADES ... ..	399	422
GLOVE TRADE ... ..	403	425
UMBRELLA AND WALKING-STICK TRADES ... ..	405	427
FANCY FUR TRADE ... ..	407	430
HATTERS' FUR TRADE ... ..	409	433
ARTIFICIAL FLOWER AND ORNAMENTAL FEATHER TRADES ... ..	410	435
LAUNDRY AND CLEANING AND DYEING TRADES:—		
(a) PRIVATE FIRMS AND COMPANIES ... ..	411	436
(b) ARMY LAUNDRIES ... ..	414	439

SECTION VII.—FOOD, DRINK, AND TOBACCO TRADES:—

GENERAL REPORT ... ..	442	—
GRAIN-MILLING TRADE ... ..	447	492
BREAD AND BISCUIT TRADES:—		
(a) PRIVATE FIRMS AND COMPANIES ... ..	451	495
(b) ARMY BAKERIES IN THE UNITED KINGDOM ... ..	453	498
COCOA, CONFECTIONERY, AND FRUIT-PRESERVING TRADES ... ..	454	500
BACON-CURING TRADE ... ..	457	503
PRESERVED MEAT, POULTRY, AND FISH, PICKLE, SAUCE, AND BAKING- POWDER TRADES ... ..	460	506
BUTTER, CHEESE, AND MARGARINE TRADES ... ..	462	509
FISH-CURING TRADE ... ..	464	512
MANUFACTURE OF FARINACEOUS PREPARATIONS AND TRADE AND HOUSEHOLD ARTICLES FOR CLEANSING AND POLISHING (EXCEPT SOAP) ... ..	467	515
CATTLE, DOG, AND POULTRY FOOD TRADES ... ..	469	517
ICE TRADE ... ..	470	519
SUGAR AND GLUCOSE TRADES ... ..	472	521
BREWING AND MALTING TRADES ... ..	475	524
SPIRIT DISTILLING TRADE ... ..	478	527
SPIRIT COMPOUNDING, RECTIFYING, AND METHYLATING TRADES ... ..	481	529
BOTTLING TRADE ... ..	483	532
AERATED WATERS, CIDER, BRITISH-MADE WINES, NON-ALCOHOLIC BEVERAGES (BREWED), AND VINEGAR TRADES ... ..	485	535
TOBACCO TRADE ... ..	488	538
NAVAL VICTUALLING YARDS (HOME ESTABLISHMENTS) ... ..	490	540

SECTION VIII.—CHEMICAL AND ALLIED TRADES:—

GENERAL REPORT ... ..	542	—
CHEMICALS, COAL TAR PRODUCTS, DRUGS, AND PERFUMERY TRADES ... ..	546	571
SEED-CRUSHING TRADE ... ..	551	575
OIL AND TALLOW TRADES (EXCLUDING SEED CRUSHING) ... ..	554	577
FERTILIZER, GLUE, SHEEP-DIP, AND DISINFECTANT TRADES ... ..	557	580
SOAP AND CANDLE TRADES ... ..	560	583
PAINT, COLOUR, AND VARNISH TRADES ... ..	563	586
EXPLOSIVES, AMMUNITION, AND FIREWORKS TRADES ... ..	567	589
MATCH AND FIRELIGHTER TRADES ... ..	569	591



DETAILED REPORTS AND TABLES— <i>continued.</i>		Report.	Tables.
SECTION IX.—PAPER, PRINTING, AND ALLIED TRADES :—		PAGE	PAGE
GENERAL REPORT	...	594	...
PAPER TRADE	...	599	624
PRINTING AND BOOKBINDING TRADES :—			
(a) PRIVATE FIRMS AND COMPANIES	...	602	627
(b) GOVERNMENT DEPARTMENTS	...	606	630
PRINTING AND PUBLISHING OF NEWSPAPERS AND OTHER PERIODICALS			
...	...	608	632
TYPEFOUNDING, STEREOTYPING, ENGRAVING, AND DIE-SINKING TRADES			
...	...	610	635
MANUFACTURED STATIONERY TRADES :—			
(a) PRIVATE FIRMS AND COMPANIES	...	612	638
(b) GENERAL POST OFFICE, SAVINGS BANK DEPARTMENT	...	615	641
CARDBOARD BOX TRADES	...	615	642
PEN, PENCIL, AND ARTISTS' MATERIALS TRADES	...	618	645
INK, GUM, AND SEALING WAX TRADES	...	620	647
TRADE PHOTOGRAPHY	...	622	649
SECTION X.—LEATHER, CANVAS, AND INDIARUBBER TRADES :—			
GENERAL REPORT	...	652	...
FELDMONGERY TRADE	...	656	672
LEATHER TRADE (TANNING AND DRESSING)	...	657	675
SADDLERY AND HARNESS TRADE	...	661	678
TRAVELLING BAG AND FANCY LEATHER GOODS TRADES	...	664	681
CANVAS GOODS AND SACK TRADES	...	666	684
INDIARUBBER TRADES	...	668	687
SECTION XI.—TIMBER TRADES :—			
GENERAL REPORT	...	692	...
TIMBER TRADES	...	696	719
FURNITURE, HOUSE FURNISHINGS AND UPHOLSTERY TRADES :—			
(a) PRIVATE FIRMS AND COMPANIES	...	701	722
(b) HIS MAJESTY'S OFFICE OF WORKS	...	705	725
WOODEN CRATE, CASE, BOX, AND TRUNK TRADES	...	706	726
CARRIAGE, CART, AND WAGON TRADES	...	708	729
BRUSH TRADE	...	711	732
COOPERING TRADE	...	714	735
BASKET AND WICKERWORK TRADE	...	716	738
SECTION XII.—CLAY, STONE, BUILDING, AND CONTRACTING TRADES :—			
GENERAL REPORT	...	742	...
BRICK AND FIRECLAY TRADES	...	746	769
CHINA AND EARTHENWARE TRADES	...	749	772
CEMENT TRADE	...	753	775
ASBESTOS AND BOILER COVERINGS TRADES	...	756	777
GLASS, STONE, ROOFING FELTS, AND MISCELLANEOUS TRADES	...	757	779
BUILDING AND CONTRACTING TRADES	...	761	782
HIS MAJESTY'S NAVAL ESTABLISHMENTS AT HOME (BUILDINGS)	...	766	788
HIS MAJESTY'S OFFICE OF WORKS AND PUBLIC BUILDINGS	...	766	791
THE BOARD OF PUBLIC WORKS, (IRELAND)	...	767	792
SECTION XIII.—MISCELLANEOUS TRADES :—			
GENERAL REPORT	...	796	...
SCIENTIFIC INSTRUMENTS, APPARATUS, AND APPLIANCES, TRADES	...	800	814
IVORY, BONE, HORN, PICTURE FRAME, AND FANCY ARTICLES TRADES	...	802	817
MUSICAL INSTRUMENTS TRADES	...	806	820
BILLIARD TABLE AND SPORTS REQUISITES TRADES	...	808	823
TOYS AND GAMES TRADES	...	811	826
WIG MAKING TRADE	...	812	828
SECTION XIV.—PUBLIC UTILITY SERVICES :—			
GENERAL REPORT	...	830	...
GAS UNDERTAKINGS	...	834	870
WATERWORKS UNDERTAKINGS	...	841	878
ELECTRICITY UNDERTAKINGS	...	845	883
LOCAL AUTHORITIES :—			
UNITED KINGDOM	...	850	...
ENGLAND AND WALES	...	853	891
SCOTLAND	...	857	899
IRELAND	...	860	906
CANAL, DOCK, HARBOUR, AND SIMILAR COMPANIES	...	864	913
TRAMWAY AND LIGHT RAILWAY COMPANIES	...	866	915
HIS MAJESTY'S POST OFFICE, (TELEGRAPH AND TELEPHONE UNDERTAKINGS)	...	868	918
THE NATIONAL TELEPHONE COMPANY	...	869	921
APPENDIX—EXPORTS AND IMPORTS	...	...	923
INDEX	...	...	927

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The following corrections, in addition to the Errata issued with the Final Report, should be made :—

Page 26. Table. *Read*—

1.	(b) Manufactured Goods	190·3	3·4	20·1	213·8
	Total	363·0	36·0	22·2	421·2
5.	Goods in their Final Stage, etc.	517·2	41·6	176·0	734·8

„ 27, first line of Table. *For* “5 per cent. 60 per cent.,” *read* “6 per cent. 63 per cent.”

„ „ third „ „ „ *For* “25” *read* “24.”

„ 396, fourth line after the first Table. *For* “£1,137,000” *read* “£1,139,000.”

„ 445, fourteenth line after first Table. *Delete* after “duties” to end of sentence, and *insert* “(about £33,500,000) on dutiable articles, other than those on Distillery Products valued at £4,776,000 free of duty.”

„ 465, seventeenth line from bottom. *For* “7,873,000” *read* “2,863,000” and *for* “2,863,000” *read* “7,873,000.”



# CENSUS OF PRODUCTION (1907).

## FINAL REPORT BY THE DIRECTOR OF THE CENSUS SUMMARISING THE RESULTS OF THE RETURNS RECEIVED UNDER THE CENSUS OF PRODUCTION ACT, 1906.

### SECTION I.—GENERAL REPORT.

#### INTRODUCTION.

The Census of Production Act, 1906, required that a census of production should be taken in the year 1908, in respect of the calendar year 1907. Power was given to the Board of Trade to vary this period in cases where it was found inconvenient to furnish the required particulars in respect of the calendar year 1907, and, accordingly, persons required to make Returns were informed that, if the financial year of their establishment was not the calendar year, they might furnish particulars for a period of twelve months, ending with any date not earlier than 30th June, 1907, or later than 30th June, 1908. It is believed that, taken as a whole, the Returns substantially represent the productive activity of the United Kingdom during the calendar year 1907.

The persons required to make Returns were defined in the Schedule to the Census of Production Act, as follows:—

- (A) The occupier of every factory or workshop within the meaning of the Factory and Workshop Act, 1901.
- (B) The owner, agent, or manager of every mine and quarry.
- (C) Every builder, that is to say, a person who, by way of trade or business, undertakes the construction or alteration of a building or any part thereof.
- (D) Every person who by way of trade or business executes works of construction, alteration, or repair of railroads, tramroads, harbours, docks, canals, sewers, roads, embankments, reservoirs or wells, or of laying or altering gas or water pipes, or telegraphic, telephonic, or electric lines or works, or any other prescribed works.
- (E) Every person who by way of trade or business gives out work to be done elsewhere than on his own premises.
- (F) Every person carrying on any other trade or business which may be prescribed."

Section 7 of the Act further provided that "for the purposes of this Act, the exercise and performance by a local or other public authority of the powers and duties of that authority shall be treated as the trade or business of that authority."

Schedules were, accordingly, issued to all occupiers of factories and workshops on the Home Office Register; to all owners, agents, or managers of mines and quarries in the official Mines and Quarries Lists; to all builders and contractors as ascertained from the Trade and Local Directories; to all railway companies, tramway companies, and harbour, dock, canal, and similar companies whose employees executed works of construction, maintenance, and repair on the companies' property; to givers-out of work as ascertained from the lists kept by Local Public Health Authorities; to all Local Authorities and to all Government Departments carrying on any work coming within the scope of the Census.

The Returns procured by the Census of Production Office did not cover Agriculture, but by special arrangements with the Board of Agriculture and Fisheries, and with the Department of Agriculture and Technical Instruction for Ireland, those Departments undertook a voluntary census of agriculture which covered the twelve months ended June 4th, 1908, in the case of Great Britain, and the calendar year 1908 in the case of



Ireland. The Reports of that Census have been separately published, viz., "The Agricultural Output of Great Britain" [Cd. 6277] and "The Agricultural Output of Ireland."

Certain classes of persons were wholly or mainly excluded from the Census although they carried on productive work. These embrace:—

- (1) Persons working on their own account. The village blacksmith, shoemaker, or saddler, the tailor or dressmaker working alone in a private house, were not, as a rule, required to make Returns unless they were on the Home Office lists as having been at the time of entry occupiers of workshops. When such cases were discovered, Returns were not in general enforced. Where persons in the building trades who, though working alone as carpenters, plumbers, &c., supplied their own materials, furnished Returns of their output, such Returns were accepted, but jobbing men who worked on their own account on materials supplied by the persons for whom they worked, or who worked part of their time for builders, were excused from making Returns.
- (2) Occupiers of domestic workshops.—Persons employing only members of their own families were not required to make Returns, but as a rule were treated as outworkers for the firms from whom they took out work. There is probably some duplication between this class and the preceding.
- (3) Men's workshops.—Workshops where only adult males are employed are not, as a rule, except in the case of bakeries, recorded on the Home Office lists of workshops, and consequently the occupiers were not as a rule required to make Returns. This exemption particularly affects repairing workshops in the boot and shoe, watch and clock, jewellery, saddlery, and other trades where repair work is frequently associated with retail dealing.
- (4) Givers-out of work.—Where a giver-out of work was himself a manufacturer, his Return covered the work given out, but where merchants and others, not being manufacturers, gave out work in trades not included in Statutory Orders under the Factory and Workshop Acts, it was not found practicable to issue Schedules to them.
- (5) Certain occupations were exempted by Rules made under the Act by the Board of Trade, viz., Tea Blending and Packing, Coffee Roasting, Grinding and Packing, Coffee and Chicory Mixing, Hay, Straw, Corn and Forage Merchants and Dealers, Bottle-washing, Fruit-cleaning, Seed Merchants, Florists, Packing, Labelling, and Carding of Goods, and Workshop Occupiers engaged in the Sorting and Breaking of Old Metal. These are all occupations in which any "productive" work which may be done is quite incidental to merchanting or retailing.

Where a firm had more than one establishment a separate Schedule was issued for each establishment, but the firm was permitted to make a combined Return for all its establishments in England and Wales, in Scotland, or in Ireland. The Census of Production Act provided that the figures for the three divisions of the United Kingdom should be kept separate.

Under the terms of Section 3 (1) of the Act the Board of Trade prescribed the following particulars to be stated by each person required to make a Return:—Nature of Trade or Business; Period of Return; Output; Materials Used; Work Given Out; Persons Employed; Days Worked; and Power Used or Generated.

The Questions relating to these matters were embodied in the compulsory part of the Schedule, and, in addition, in suitable cases manufacturers were requested to furnish voluntarily certain further particulars respecting output, machinery used, and coal consumed.

#### Output.

The "Output" shown in the Tables is the gross output of each trade, *i.e.*, where goods pass through the hands of several manufacturers at different stages, their quantity and value have been registered at each stage. The value of this gross output is, therefore, greater in the aggregate than the value of the goods, considered as a whole, when ready for export or consumption. For example, in the cotton trade, yarn is usually spun by one set of firms and sold to other firms who weave it into cloth; both sets of firms made Returns to the Census Office, the one set showing the value of the yarn as the value of their output, while the second set showed the value of the cloth as the value of their output, the value of the yarn being included by them in the cost of their materials.

It follows that the value of so much of the yarn as was woven into cloth was recorded twice over in the records of the Census, except in the case of yarn spun by firms that also wove it into cloth, and care should be taken not to interpret the total of the output Table for any trade as necessarily being the value of the goods at the time when they left that trade, if the trade is considered as a unit. In the following Report estimates are given of the selling value of the output of each trade and of certain important groups of trades, after deduction of the value of products included more than once in the manner explained above.

The figures entered against each class of products show the output of the products of that class in the year, whether sold or not, excluding any amount worked up in the same factory into goods of a kind separately classified. Consequently, in the case of semi-manufactured goods (*e.g.*, yarns, pig-iron, ingot steel, &c.) the entry against each class of goods does not represent the total make of that class in the year of return, but only the quantity made in the year and sold by the maker in that form or retained in stock in that form. Thus, if a steel maker made both steel and rails, he would return against steel ingots only that part of his annual make which was sold as ingots or remained in stock at the end of the period as ingots; steel made into rails would be entered not as ingots but as rails. In the case of important semi-manufactured products, manufacturers were asked to state voluntarily what was their total make in the twelve months, whether the products in question were sold or held in stock or were further worked up in the same establishment. Estimates of the quantities of such products have been made wherever the replies to the Voluntary Questions and the other information at the disposal of the Census Office proved sufficient.

Manufacturers were directed to state the quantity and value of their output in the year of return, taking it at the stage in which it left their works for sale, or remained in stock at the end of the year. Under "sale" was included transfer to another establishment belonging to the same owners, or to another department of the same works, when, in either of these two cases, a separate Return was being made for the second establishment or department. The output of any class of goods does not represent the sales in the twelve months, but the sales plus the value of the stock at the end of the period and less the value of the stock at the beginning of the period.

Section 3 (1) (c) of the Census of Production Act, 1906, provided that:— "Particulars as to the quantity of output shall not be required except in the case of articles the quantity of which is on their importation into or exportation from the United Kingdom required by the official import or export list to be entered, nor shall such particulars be required in greater detail than in those lists." For the purpose of classifying output in the Census Schedules the headings in the Import and Export Lists were adopted so far as they were applicable, and manufacturers were then required to state both quantities and values. In many cases, however, the classification followed in those lists, while suitable for merchants doing an export or import trade, was not convenient for manufacturers; in such cases a different classification was adopted and values only were then required to be stated.

Where firms made goods for sale, they were instructed to return the "net selling value" of each class of goods made. In order to effect a valuation on a common basis, the value of goods sold was taken to be the actual amount charged for the goods, less estimated deductions for discounts, agents' commissions, and out-of-pocket expenditure for carriage outwards; but the cost of cartage and delivery by a firm's own staff, and the salaries and expenses of travellers solely employed by the firm making the Return, were not deducted.

By special arrangement with the representatives of the mining industry, the value of coal and other mine-products was returned as at pit-head, the cost of carriage over private lines to a public railway line, or to the point of shipment or sale, being estimated and deducted from the selling price. With this exception, it may be said that firms making Returns stated the value of their goods at the point where they left the hands of the firms' employees. The value of flour, for example, was returned at its value at the railway station when carted to the station in the miller's carts and put into trucks by his employees, or at the mill-door when carted away by persons not directly employed by the miller. Again, the value of bread was returned as its value at the shop when taken away personally by the customer, and at the customer's door when delivered in the baker's van.

Where goods were usually sold packed for sale and the cases, &c., were not returnable, manufacturers were instructed to take as the "amount charged" their value in condition so packed; but where the cases, &c., were returnable, the amount to be taken was to be the value of the goods only, exclusive of the value of the cases, &c.



Firms making or repairing their own cases were directed to include such work as part of their output, when the value of the cases was not included in the value of the goods.

The value of goods made in the year of return, but not sold at the end of the year, was to be estimated as closely as was reasonably possible on the basis of the market prices ruling at the end of the year; but where stock was held against orders, it was to be valued on the basis of those orders.

Where firms, in addition to their manufacturing business, also bought and resold goods not of their own manufacture, they were requested to exclude transactions of the latter character from their Returns, both as regards sales and purchases, and to omit from their statements of persons employed those members of their staff who were wholly or mainly engaged in connexion with their merchanting business. In the case of certain trades, representations were made to the Census Office to the effect that manufacturers would not be able to separate their merchanting or "factoring" business from their manufacturing business. Such firms were, accordingly, permitted to include in their statements of output the selling value of the factored goods along with that of the goods made, but were asked to state separately the approximate total cost of all the factored goods so included, and also to include it in the cost of their materials. On the basis of the information furnished in the individual Returns it was found possible to adjust the statements of output, and of materials used, by the deduction of the cost of the factored goods from both. The value of the goods manufactured, as recorded in the Tables, is, however, swollen by the inclusion of the profit made on the factored goods included in the Returns, but that profit can only have been small in proportion to the total value of the manufactured goods included in the Returns for the trades in question, and the figures given in the Tables are not seriously affected by this consideration.

Firms that worked on commission, or for the trade, on materials given out to them by other firms were instructed to state as the value of their output only the amount received for such work, exclusive of the value of the materials so supplied to them. When commission work, or work done for the trade, was given out by manufacturing firms, its value was also included by those firms in the value of their output, and in order to enable the consequent duplication to be eliminated firms were required to state the total amount paid by them for work given out by them (*see post*, page 5). Where the work was done not for manufacturers but for merchants, retailers, or other persons not required to make Returns, the figures included in the Tables do not show the total selling value of all the goods of such classes made in the United Kingdom, since only the amount paid for the work has been returned to the Census of Production Office, and not the profits of the giver-out nor the cost of his materials, part of which may have been imported while part may have been included in the output recorded in the Tables.

In the case of repair and jobbing work, the value of the output is, naturally, the gross amount charged for the work done.

Where Government Departments, Local Authorities, Railway, Canal, Harbour, and other public service companies manufactured goods for their own use and not for sale, or carried out works for their own purposes and not on order from other parties, they were instructed to state as the value of their output the cost of manufacture or construction, *i.e.*, a sum covering the cost of materials, wages, and the establishment charges appropriate to the manufactures or works. In those cases, therefore, the value of output is on a different basis from that of the output of ordinary manufacturing firms and companies, which contains the element of profit, and the two classes should not be added together or compared unless due account is taken of this fact.

#### Materials Used.

When manufactured goods pass through the hands of several manufacturers at different stages, their value has been registered at each stage, not only as output, but also, except in the last stage, as materials. Thus, the pig-iron which appears as output in the Return of an iron-making firm is included as part of the materials of the steel-making firms to whom it was sold, and the steel made by the latter is output in their Returns and materials in the Returns of the engineering firms who converted it into tools or machinery. The total shown in the Tables for any trade-group as the cost of the materials used in that trade is consequently greater than the actual cost of the materials used by that trade, taken as a whole, except in those cases (such as baking) where the finished product of the trade is wholly produced by one class of firm conducting the entire process of manufacture. All such duplication within a trade, or between different trades, is eliminated when the total of the sums returned as the cost of materials is deducted from the total of the sums returned as the value of output, the result of such

deduction being the aggregate value added by the manufacturing operations of the trade or trades concerned to the materials used by them (*see page 7, Net Output*).

Where a firm produced goods at several stages of manufacture and made one Return covering the whole output, instructions were given to include as "materials" only the materials purchased and to neglect the goods at the intermediate stages. Thus, a firm that bought wool, combed it into tops, spun the tops into yarn, and wove the yarn into cloth, would include under materials the wool purchased but not the tops or yarn made by them from the purchased wool.

Materials were defined as including all raw, semi-manufactured, and other materials and components worked up or used in producing the output; all fuel, gas, and electric current purchased; all tools (not forming part of the permanent machinery and plant) replacing those worn out in the year; non-returnable cases, casks, &c., and materials for packing; and all materials used by the firm's own workpeople in repairs to or construction of the firm's own buildings, plant, or machinery. Permanent plant or machinery bought in the year of return, wages, salaries, rent, depreciation, and similar charges were excluded.

The cost of the materials used does not correspond with purchases in the period, but represents purchases in the twelve months plus materials in stock at the beginning of the period and less materials in stock at the end of the period. Goods purchased in the year were to be taken at their net cost as delivered at works, and stocks were to be valued at the amounts at which they stood in the firm's books at stock-taking. Materials transferred to an establishment from another works belonging to the same owner were to be treated as purchased at the amount charged (and included in its Return of output to the Census Office) by the delivering department. Goods simply bought and resold without any work being done on them, or merely repacked, were not to be treated as materials or as output (*see above*, pages 2 and 4). Firms working on commission or for the trade were instructed to return as materials only goods which they themselves had purchased and used, and not the materials given out to them by the firms for whom they worked.

Under the provisions of the Census of Production Act the cost of materials was required to be stated in one sum only without any details. Manufacturers were, however, asked to state voluntarily the quantities of coal and of coke used by them, and this information was very generally given.

#### Work Given Out.

Firms working on commission or for the trade returned to the Census Office as the value of their output the amounts received by them for such work, and at the same time the manufacturing firms for whom they worked included the value of such work in the value of the finished goods which they returned to the Census Office as the value of their output. In order to enable the Census Office to eliminate such duplication, manufacturing firms were required to state the total amount paid by them to other firms for work given out to be done on materials supplied by the principal firm. Instances of this kind of work occur where a firm of cloth manufacturers gives out cloth to be bleached, dyed, or finished, where a firm of apparel manufacturers gives out cloth, &c., to be made into garments, where a firm of builders sub-lets part of a contract (*e.g.*, the steel-work or decoration), and in many other cases. In certain cases, *e.g.*, where a shipbuilder gives out a contract for constructing the engines of a ship he is building, such sub-contract work is not materially different from the purchase of the complete engines, and in some cases, therefore, the payments for contract work have been included by the persons making the Returns with the cost of materials used, while in others they have been included with payments for work given out.

#### Persons Employed.

In order to obtain an indication of the variation in employment in the course of the year, the occupiers of factories, the owners of mines and quarries, builders and contractors, and local and public authorities were required to state the numbers of persons employed on four specified days, the last Wednesdays in January, April, July, and October. It was understood that occupiers of workshops had less complete records, and consequently they were only asked to state the numbers ordinarily employed, without showing the variation in those numbers on different specified dates. Males and females were to be stated separately, and a further distinction was to be made between those under and those over eighteen years of age, except in the case of those employed in mines and quarries where the age was taken as sixteen, the former being the upper limit of the age for young persons fixed by the Factory and Workshop Act, 1901, and the latter of the age fixed



by the Mines and Quarries Regulation Acts. Separate particulars were also required to be given as to "wage-earners," "salaried persons," and "outworkers."

The number required to be stated (except as regards outworkers) was the approximate numbers at work on the four specified days, including all the persons employed on each shift if more than one shift was worked in the 24-hour day. If on any such day there was a total or partial cessation of work owing to strikes, holidays, &c., the nearest normal day was to be taken in lieu thereof; the date taken in such cases was also to be stated. When the workshop or factory was connected with a wholesale distributive business, or with a retail shop, persons exclusively engaged in such business or shop were not to be included.

"Wage-earners" were defined to include all persons employed by the firm on the specified days, whether paid wages or not, who belonged to the class usually entered on the weekly pay-sheet, including those engaged in mining, quarrying, or building, or on public works, or in any manufacturing process, or in cleaning or repairing the building or machinery, or about the engines, or in the immediate superintendence of the operative staff, or as warehousemen or carters, or in any other work connected with the manufacturing process, or with mining, quarrying, building, &c.

Under the general heading of "Salaried Persons," Returns were required of all clerks at factory and offices; all travellers, salesmen, and buyers (but not shop assistants) in the sole employment of the firm; and the management staff.

"Outworkers" were defined as persons doing work on materials supplied by the firm making the Return but not working on that firm's premises. If any such person employed workpeople, his or her employees were not to be included. The numbers required to be stated were the numbers included in the half-yearly lists of outworkers sent to the Local Public Health Authority, where such lists were required to be sent under Section 130 of the Factory and Workshop Act, 1901, and the numbers borne on the books of the employing firms in those trades where such lists were not required to be sent.

The distinction which it was sought to establish between salaried persons and wage-earners has not been uniformly maintained, partly because different manufacturers had different views as to the classification of their staff, and partly because working employers, especially in small businesses, very frequently classed themselves as wage-earners.

#### *Days Worked.*

Manufacturers and others were directed to state the number of calendar days on which the establishment was open for production, excluding days on which no production was carried on but only a few men were in attendance to effect repairs, or to keep engine fires alight, or to do similar work. Saturday was to be reckoned as a full day. In trades where it was usual to employ workpeople in production on Sundays, the persons making the Returns were asked to state the percentage of wage-earners at work on Sundays, in order to prevent an exaggeration of the Return where only a small proportion of the staff was so employed.

As in the answers to this Question no account is taken of the length of the working day, or of the number of shifts worked, or of overtime, or of short time, the replies give only a very general indication of the state of trade or employment. Consequently, while the information furnished was of use in the examination of the individual Returns, it has not been found practicable to utilize the particulars obtained in any of the Tables annexed to this Report.

#### *Engines and Electricity.*

In order to obtain a record of the engine equipment of the various industries, manufacturers and others were instructed to state the horse-power of the engines owned by them, irrespective of the purpose for which they were used or of the fact that some of them might be at times idle. The engines were grouped into Steam Engines (distinguishing between Reciprocating Engines and Steam Turbines), Internal Combustion Engines (Gas and Oil together), Water Power, and Other Power. The capacity to be stated was defined to be the horse-power which the engines were built to produce; where an indicator was used, the capacity was to be measured by the indicated horse-power for continuous working.

Further, information was required as to the capacity (in kilowatts) of dynamos or generators used to produce electricity, grouping them into three classes according as they were driven by reciprocating steam engines, by steam turbines, or by other power. The electricity generated (in Board of Trade units) by each of these three classes of dynamos

was also required, but owing to their records being defective many manufacturers were unable to furnish replies. The extent to which it has been found possible to utilise the Returns is shown on pages 15 to 18. Finally, a statement was required of the number of units of electricity purchased in the year of Return, without making any distinction between electricity purchased for power and that purchased for lighting. A number of small firms stated the amount paid instead of the number of units purchased, but an approximate estimate of the quantities was made in the Census Office, and the total figures may be regarded as substantially accurate.

Where firms paid an inclusive rent for room and power they were instructed not to answer the Question, but to give the name and address of the landlord from whom they rented their power. Separate Schedules were then issued to such landlords requiring them to furnish information as to the capacity of their engines and dynamos and the quantity of electricity generated or purchased. The Returns received have been tabulated, but as the same landlord frequently supplied power to several sub-tenants engaged in different industries in the same building, the particulars furnished can only be summarised in the mass without being distributed among the various trades otherwise summarised separately.

#### *Voluntary Questions.*

Manufacturers and others were also asked to furnish voluntarily information on various points, the chief being:—

1. Value of Output in 1906. In order to have some figures for comparison with those of the censal year, owners of mines under the Coal Mines Regulation Act and manufacturers owning factories and engaged in the following branches of industry were asked to state in one aggregate sum the value of their output in the twelve months preceding the period for which they had furnished the compulsory information:—Cotton Trade; Woollen and Worsted Trades; Iron, Steel, and Tinplate Trades; Engineering and Electrical Engineering Trades; Shipbuilding Trade; Leather Trade.
2. Semi-manufactured Products. In order to obtain a measure of a number of important industries at one stage, manufacturers were asked to state the quantity of certain semi-manufactured goods (*e.g.*, yarns, tops, pig-iron, &c.) made in the year of return, whether sold, or held in stock, or further worked up in the same establishment.
3. Quantity of Output. Where the value of output was required to be given in a different classification from that adopted in the Export and Import Lists, manufacturers were asked to furnish voluntary statements regarding the quantities of various classes of goods made.
4. Further Details of Output. In some instances manufacturers were asked to supply voluntarily a classification of their output on a different basis from that adopted in the compulsory part of the Schedule, so as to bring out some additional information which, it was understood, would be useful to the trades concerned.
5. Machinery and Plant. Wherever the conditions permitted, manufacturers were asked to give certain particulars as to the capacity of their plant and the number of machines used.
6. Fuel Consumed. Manufacturers were asked to state the quantities of coal and of coke used by them in the year of return.

Workshop-occupiers were not as a rule asked these questions.

The information given has been tabulated in all cases, and, so far as it has been furnished to an extent to render it of service, it has been utilized in the Reports on the separate trades.

#### *NET OUTPUT.*

It has already been pointed out that where goods pass through the hands of several firms at different stages of manufacture, and these firms include in their Returns to the Census Office the value of the goods at that stage at which they form the output of such firms, there must be considerable duplication, alike in the total value of the gross output of the trade and in the total cost of materials as shown in the Tables. This duplication exists not only within the same trade but also between different trades. Further, there is duplication between the Returns made by firms working on commission or for the trade and those furnished by the principal firms for whom they work. All this duplication is eliminated when—for any industry or group of establishments the total cost of



materials used and the amount paid to other firms for work given out to them are deducted from the value of the gross output. The figure resulting from this operation may, for convenience, be called the "net output" of the industry or group. It expresses completely and without duplication the total amount by which the value (at works) of the products of the industry or the group, taken as a whole, exceeded the cost (at works) of the materials purchased from outside, *i.e.*, it represents the value added to the materials in the course of manufacture. This sum constitutes for any industry the fund from which wages, salaries, rent, royalties, rates, taxes, depreciation, advertisement and sales expenses, and all other similar charges have to be defrayed, as well as profits.

It is to be observed that (omitting cases of commission work) the net output is ascertained by deducting the cost of materials *at works* from the value of the output *at works*, that is to say that there is deducted not only the cost of materials as it was included in the statements of output made by the firms producing such materials (*i.e.*, their factory cost), but also the merchants' charges and the expenses of carriage incurred in getting the materials from their place of production to the place where they were used. In eliminating duplication more has been deducted than the production-cost of materials and the amount paid for commission work, but this fact does not alter the character of the net output considered as a fund or the nature of the charges specified above as charges on that fund.

#### PERSONS EMPLOYED.

According to the Population Census of 1901 the number of persons in the United Kingdom describing themselves as engaged in the trades (other than agriculture) and fisheries) covered by the Census of Production was 8,629,102, to which should be added a proportion of the "commercial or business clerks" (439,972 in all) in respect of clerks engaged in the offices of factories, workshops, mines, &c., raising the total to about 8,800,000 persons. Assuming that the growth of population between 1901 and 1911 was uniform, and that the rate of growth between 1901 and 1907 in the number of persons covered by the Census of Production was approximately the same as in the population as a whole, the total number of persons (apart from those engaged in agriculture) coming within the scope of the Census of Production in 1907 was about 9,250,000 persons.

In 1901 these persons were classified as follows, dealers being excluded so far as they were separately recorded :

—	Employers.	Working for Employers.	Working on own account.	"Others or No Statement."	Total.
England and Wales...	192,836	6,249,965	380,796	31,632	6,855,229
Scotland ... ..	30,391	936,814	39,986	528	1,007,719
Ireland ... ..	—	—	—	—	529,020
Laundries (United Kingdom).	—	—	—	—	237,134
Total ... ..	—	—	—	—	8,629,102

Detailed figures for Ireland, and for the United Kingdom in respect of laundries, are not given. If, however, a calculation be made on the following basis, *viz.* :—(a) that the distribution between employees and employers in Ireland was similar to that for Great Britain ; (b) that laundry workers described as working at home were employed on their own account ; (c) that the distribution of the remaining persons engaged in laundry work was similar to that ascertained for those firms that made Returns under the Census of Production Act ; and (d) that the class of "others or no statement" consisted mainly of persons working on their own account—it may be estimated that the 9¼ million persons who probably came within the scope of the Census of Production in 1907 (excluding agriculture and fisheries) were distributed as follows :—

Employers ... ..	260,000
Working for employers ... ..	8,390,000
Working on their own account ... ..	600,000
Total ... ..	9,250,000

The total number so estimated may be somewhat in excess of the actual number, as it is generally believed that the number of persons engaged in commerce, transport, and distribution has increased more than the total number of persons engaged in manufacturing and extractive industries. On the other hand, the rate of growth of the adult population was somewhat in excess of that of the population of all ages.

The Returns made to the Census of Production Office showed the numbers actually at work on four specified days (the last Wednesdays in January, April, July, and October in the year of return) in factories, mines, quarries, building and contracting works, and on works of construction, maintenance, and repair carried out by the employees of public authorities and of railway, canal, and similar companies, together with the numbers ordinarily employed in workshops in the year of return and the numbers of outworkers employed on the 1st February and 1st August, 1907, by the firms making Returns. The average number thus recorded in the industries (other than agriculture and fisheries) covered by the Census was 7,087,123, distributed as follows :—

Salaried Persons ... ..	491,847
Wage-earners ... ..	6,493,129
Outworkers ... ..	102,147
Total ... ..	7,087,123

The average number of wage-earners employed in factories, mines, building works, &c., was 5,953,942, and the maximum number at work on any of the four specified days was 6,071,160 ; for salaried persons the numbers were 402,691 and 405,689, respectively. The number of wage-earners returned as "ordinarily employed" in workshops was 539,187, and the number of salaried persons was 89,156. Assuming that the latter figures represent approximately the average numbers employed in workshops, and that the variation in employment in workshops was similar to that in factories, mines, &c., the maximum number of persons employed in connexion with the production of the output shown in the Census of Production Returns would be about 7,219,000. This figure, however, is subject to a small reduction in respect of migrant fish-curers who have been counted more than once at different stations.

The figures of persons employed in industry, as recorded in the Census of Population and as returned to the Census of Production Office, are not directly comparable, either in the aggregate or for the several industries separately.

(1) In the Population Census the records are based on the statements of persons who described themselves as engaged in industry, but it is known that persons who have ceased to work at a trade often describe themselves, for the purposes of the Census of Population, as still belonging to that trade. In this connexion it may be observed that, in addition persons returned as pensioned or retired, there were about 868,000 persons of 55 years of age and upwards recorded in the Census of Population for 1901 as engaged as manufacturers, and their employees in the trades covered by the Census of Production, of whom about 272,000 would be over 65 years of age. Calculating on the same basis as before, there would be about 914,000 such persons over 55 in 1907, of whom about 286,000 would be over 65. Most of the persons over 65 and a large number of those between 60 and 65 would be only nominally "employed," or would be doing only some casual work. Further, a large number were employed more or less irregularly during the year, and many of them may not have been at work on all, if on any, of the days to which the Returns made to the Census of Production Office relate. The average extent of unemployment and of sickness among the workers covered by the Census of Production must also be taken into account, since persons absent from these causes would be included in the Census of Population, but not in the Census of Production Returns. Account has also to be taken of persons not working owing to strikes. Thus, a considerable deduction, amounting probably to from one-half to three-quarters of a million persons, should be made from the number of persons described in the Census of Population as belonging to the industries covered by the Census of Production in order to arrive at the average number at work on the four selected days.

(2) The Census of Population includes as working in their respective trades a large number of persons (such as carpenters, smiths, wheelwrights, fitters, bricklayers, &c.) employed by warehouses, shops, cartage contractors, and other



firms or persons not making Returns in connexion with the Census of Production. A deduction should be made from the Population Census figures in respect of such workers before comparisons can be made with the Census of Production figures.

- (3) Census of Production Schedules were only sent to those workshop proprietors who were on the Home Office list. Persons who do not employ young persons or women are not, as a rule (except in the case of bakers), on the Home Office list, and therefore "men's workshops," where men only are employed, have generally escaped record. Further, the 600,000 persons estimated to be working on their own account were either excluded from the Census of Production (except in so far as some may have been returned as outworkers), or if, as happened with many jobbing men in the building trades, Schedules were sent to them, such Schedules were cancelled on discovery of the facts. It is also known that there were about 80,000 persons to whom Schedules were sent who either returned Schedules unfit for tabulation, or, owing to "want of records," were unable to fill up their Schedules; such persons were generally in a small way of business, employing not more than two or three wage-earners each.

It appears reasonable to estimate that if complete Returns had been received with regard to the production carried on in 1907, about  $8\frac{1}{4}$  to  $8\frac{1}{2}$  million persons would have been recorded as employed in the trades coming within the scope of the Census of Production, excluding those engaged in agriculture and fisheries, while the output of about 7,250,000 of these is accounted for in the Returns made to the Census of Production Office. The remaining 1 to  $1\frac{1}{4}$  million persons were engaged chiefly in the clothing, boot and shoe, laundry, and building trades, and over 300,000 of them were women. In the main they consisted of persons working on their own account, who worked more or less intermittently and, after paying for rent and work-room expenses, earned but a moderate remuneration. The net output of these persons cannot be put at more than £50,000,000 per annum, and approximately that amount should be added to the aggregate net output (£712,000,000) shown by the Returns made to the Census of Production Office, in order to obtain a full representation of the net output of the industry of the country as covered by the Census of Production.

It will have become apparent from the preceding observations that the occupation statistics of the Population Census cannot be compared in detail with the numbers of persons employed in individual industries as returned to the Census of Production. In the Population Census a man is grouped according to the nature of the occupation by which he has described himself, irrespective of the character of the output of the firm employing him, while for the purposes of the Census of Production a man is classed, not by the nature of the work he does, but according to the kind of goods made by the establishment in which he works. Thus, an engineer working in a cotton mill is, for the purposes of the Population Census, classed as an engineer, but for the purposes of the Census of Production he is classed as a person engaged in the cotton industry.

Statistics of employment have also been collected by the Home Office, annually under the Coal Mines Regulation Act, the Metalliferous Mines Regulation Act, and the Quarries Act, and periodically under the Factory and Workshop Act. These figures, as returned to the Home Office for the year 1907, to which the Census of Production applied, cannot be compared in detail with those returned to the Census of Production Office, for a number of reasons:—(1) The Home Office figures relate to the numbers "ordinarily employed" in the calendar year 1907, "whether during the whole year or for a shorter term," and, in the case of seasonal trades, to those "ordinarily employed during the employment season of the year 1907," whereas the Census of Production figures do not in all cases relate to the calendar year 1907, but may cover part of the year 1906 or part of the year 1908, and in the case of factories are based on the numbers actually at work on four specified days. (2) Salaried persons, carters, and warehousemen are excluded from the Home Office statistics. (3) The Home Office figures do not include persons engaged in the construction, maintenance, and repair of buildings, railways, tramways, canals, docks, roads, drains, and other public works except in so far as they are employed in factories or workshops under the Factory and Workshop Act; in that case they are classified under the trades to which they belong. On the other hand the Home Office figures cover certain trades excluded from the Census of Production, e.g., packing, carding, and making up goods for sale, chaff and straw cutting, sorting old iron, bones, rags, &c., seed cleaning, portrait photographers, &c. (4) In the Home Office statistics persons are classed, as in the Census of Population, according to their occupation, whereas the Census of Production Returns showed only the aggregate of

persons employed in each establishment and did not distinguish between the various occupations of such persons. For example, the machinery and engineering group of the Home Office includes not only engineers returned to the Census of Production Office on the Schedules for the engineering trades but also those returned on Schedules for other trades and classified together with the other persons engaged in those trades. Again, the persons classified by the Home Office in the group "plumbing, heating, gas fitting, ventilating, sanitary, and water appliances" are divided by the Census of Production Office between the "building trades," the "heating, ventilating, and sanitary engineering trades," and "gas undertakings." Further, persons engaged in the manufacture of motor-cars are included partly in the engineering trade and partly in the cycle and motor trade in the Census of Production classification, whereas in the Home Office statistics they form a group along with persons engaged in building locomotives. Again, in the Census of Production Reports it was found desirable to include persons engaged in the manufacture of ordnance in the engineering trades, while the making of small arms, swords, &c., is treated as a separate trade; but in the Home Office statistics "ordnance, small arms, swords, &c.," constitute one group.

The following statement gives the comparison of the figures so far as that is possible. For the purposes of this comparison the Home Office figures for shallow quarries and salt works, included with "Non-Textile Factories" and "Workshops," have been grouped with "Mines and Quarries," and those relating to flax-scutching works, velvet and fustian cutting works, rope works, rag sorting and grinding works, lace warehouses, and bleaching, dyeing, and printing works (except job dyeing and dry cleaning), also included with "Non-Textile Factories" and "Workshops," have been grouped with "Textile Factories and Workshops." The figures relating to employment in "chaff cutting, &c.," have been deducted from the Home Office figures, and 806 persons employed in attending engines by factory owners who leased out power have not been included in the Census of Production figures:—

	Home Office figures.		Census of Production figures.		
	Wage-earners ordinarily Employed in		Factories, Mines, &c. Wage-earners actually at Work.		Workshops. Persons ordinarily Employed.
	Factories, Mines, and Quarries.	Workshops.	Maximum.	Average.	Average.
Mines and Quarries ... ..	1,064,555	—	965,438*	947,178*	—
Textile Factories and Workshops	1,220,321	26,624	1,196,620	1,190,648	20,129
Other Factories and Workshops ...	3,260,046	611,645	2,940,776	2,880,518	519,058
Building and Contracting... ..	†	†	521,232	496,367	—
Railways, Tramways, Canals, &c.	†	†	247,093	244,249	—
Local Authorities and Waterworks	†	†	199,189	194,176	—
	5,544,922	638,269	6,070,348	5,953,136	539,187
	6,183,191		Maximum ...	6,609,535	
			Average ...	6,492,323	

\* Including a maximum of 1,550 and an average of 1,481 persons engaged in the manufacture of briquettes, which is included in the Home Office figures under "Other Factories."

† Included under "Other Factories and Workshops," so far as such persons worked in factories or workshops.

The difference between the figures for mines, quarries, and works connected therewith as shown by the Home Office and the figures shown in the Census of Production Returns is due to the exclusion from the latter of persons not at work on the four specified days and of persons employed on private branch railways connected with mines and quarries, and to the fact that persons engaged in quarries worked for their own purposes by builders, road contractors, railway companies, local authorities, &c., were classed for Census of Production purposes not under "quarries" but under "building and contracting trades," "railway companies," &c. In the textile group the Home Office figures include persons engaged in lapping and making up yarns and piece goods, occupations which do not come within the scope of the Census of Production, while in the figures relating to fish-curing, included in "other factories and workshops," migrant fish-curers are believed to be reckoned more than once at different curing centres from which Returns were made to the Census of Production.

In the following Table the number of persons employed as returned to the Census Office is distributed by sex and age and according as they are wage-earners or salaried



persons; a column is also added showing the number of outworkers returned as borne on the books of the employing firms:—

Group of Trades.	Average Number of Persons Employed.								Outworkers.	
	Wage-earners.				Salaried Persons.					
	Males.		Females.		Males.		Females.		Males.	Females.
	Under 18 years of age.	Over 18 years of age.	Under 18 years of age.	Over 18 years of age.	Under 18 years of age.	Over 18 years of age.	Under 18 years of age.	Over 18 years of age.		
Mining and Quarrying* ...	63,616	877,452	811	5,299	725	17,115	5	207	—	—
Iron and Steel, Engineering, and Shipbuilding Trades.	157,508	1,200,346	21,322	53,313	11,378	87,817	1,531	6,200	1,650	2,029
Metal Trades, other than Iron and Steel.	12,610	66,988	6,137	15,952	844	8,869	775	2,298	2,793	425
Textile Trades ...	103,009	383,416	176,356	547,996	3,740	35,011	697	2,819	1,157	12,991
Clothing Trades ...	30,756	163,946	111,992	374,611	3,647	37,087	3,685	30,742	20,804	53,773
Food, Drink, and Tobacco Trades.	34,117	236,784	31,979	97,737	3,767	52,539	919	5,809	—	—
Chemical and Allied Trades	7,476	82,101	5,463	15,067	1,638	14,432	229	1,436	1	116
Paper, Printing, Stationery, and Allied Trades.	34,252	146,762	33,684	72,524	3,596	28,985	1,133	4,539	9	1,606
Leather, Canvas, and India-rubber Trades.	6,419	49,005	4,802	15,440	699	7,455	165	739	184	932
Timber Trades ...	32,227	161,164	5,315	16,058	1,654	21,078	247	1,452	378	2,428
Clay, Stone, Building and Contracting Trades.	60,286	577,323	9,446	27,524	3,113	44,492	513	2,543	—	—
Miscellaneous Trades ...	5,513	24,481	4,248	7,890	309	3,473	158	802	304	567
Public Utility Services ...	6,415	306,069	19	1,297	1,206	27,137	19	329	—	—
Factory Owners—Power only	8	798	—	—	—	—	—	—	—	—
Total ...	554,212	4,276,635	411,574	1,250,708	36,316	385,540	10,076	59,915	27,280	74,867

\* In this group persons employed were classified as under or over 16 years of age, except in the case of briquette works, shale oil works, and salt mines and works.

In all trades 93.0 per cent. of the persons employed were wage-earners and 7.0 per cent. were salaried persons (including principals).

Of the wage-earners, 74.4 per cent. were males and 25.6 per cent. were females.

Of the salaried persons, 85.8 per cent. were males and 14.2 per cent. were females. Of the total number employed other than in mining and quarrying 12.6 per cent. of the male wage-earners and 24.8 per cent. of the female wage-earners were under 18 years of age; and 8.6 per cent. of the male salaried persons and 14.6 per cent. of the female salaried persons were under 18 years of age.

According to the special Report on the Agricultural Output of Great Britain, prepared by the Board of Agriculture and Fisheries, there were in Great Britain in 1908 about 500,000 occupiers of holdings, and in addition to them, but including members of their families (502,000), permanent labourers (671,000), and temporary labourers (167,000), 1,340,000 persons engaged in agriculture. According to the Report on Agriculture prepared by the Department of Agriculture and Technical Instruction in Ireland there were engaged in agriculture in 1908 in Ireland 984,358 persons, of whom 577,292 were farmers or farmers' sons, 184,084 male permanent labourers, 109,987 male temporary labourers, and 112,995 women and girls.

In the year 1907 there were regularly engaged in sea-fishing in Great Britain and Ireland 73,188 persons and there were also 34,235 persons occasionally employed (Annual Statement of the Navigation and Shipping of the United Kingdom for 1907 [Cd. 4256]).

There were, consequently, in the period covered by the Census of Production, about 2,824,000 persons engaged in agriculture, about 107,000 persons engaged in fishing, and about 8½ to 8¾ million persons engaged in other industries coming within the scope of the Census of Production, or altogether from 11 to 11½ million persons. Some deduction should, however, be made from this total in respect of persons occasionally engaged in agriculture or fishing and also recorded as employed in other industries.

#### NET OUTPUT PER HEAD OF PERSONS EMPLOYED.

One method of comparing different industries with each other is to take the net output in relation to the number of persons employed. When this is done wide differences between the different trades are at once apparent. As the net output is the fund out of which all charges on industry, except the cost of materials as delivered at the works, are met, it will naturally vary with the amount of those charges.

(1) A large average net output per head is usually associated with high average wages, and, therefore, is more generally found in men's trades than in women's trades. Thus, the

net output of textile factories (cotton, wool, jute, hemp, linen, silk, lace, hosiery, elastic webbing, and sundry textiles) amounted to £83,334,000 or £73 per head of the 1,135,541 employees, of whom 62 per cent. were females, while the net output of the iron and steel, tinplate, iron tube, wire, shipbuilding, and engineering industries, where less than 3 per cent. of the 970,861 employees were females, amounted to £105,395,000 or £109 per head. In the textile trades, where the proportion of females is always high, the net output varies both with the level of men's wages in the trade and also with the ratio of males to females, as the following Table shows:—

	Census of Production.		Earnings and Hours Enquiry.	
	Net Output per head.	Percentage of Females Employed.	Earnings of Females as a Percentage of Total Earnings.	Average Annual Earnings All Employees.
	£	Per cent.	Per cent.	£ s.
Lace ...	98	55.5	23.8	54 10
Cotton ...	79	61.5	49.4	45 0
Wool and Worsted, Carpet, Flock, and Shoddy	70	56.7	45.3	40 0
Elastic Webbing ...	68	62.5	44.1	37 0
Hosiery ...	61	74.6	59.3	38 10
Silk ...	55	68.7	56.2	34 10
Linen, Jute, and Hemp (Spinning and Weaving)	61	67.9	56.3	31 10

The particulars as to wages are taken from the "Report of the Earnings and Hours Enquiry: I. Textile Trades in 1906" [Cd. 4,545]. With these figures for textile factories may be compared the figures for the allied industry of bleaching, dyeing, printing, and finishing of textile goods. Here the proportion of females employed is only 18 per cent., and the net output per head is £101, while the earnings of females were only 9.4 per cent. of the total earnings and the average annual earnings of all workpeople were £54 10s. In this case the lower level of wages, both of males and females, as compared with the lace and cotton trades, is offset by the greater proportion of men employed.

(2) A high net output per head is also associated with heavy capital expenditure, and thus it will generally be higher in trades in which the need for expensive equipment throws the trade mainly into the hands of large firms than in those in which small firms predominate. Thus, we can compare the following pairs of trades, those in the first series being mainly trades of large businesses, and those in the second, trades with a considerable number of small firms:—

	Net Output per head.		Net Output per head.
	£		£
Iron and Steel Smelting, Rolling, and Founding.	115	Cutlery Making ...	73
Copper Smelting, Rolling, and Founding.	137	Brass Finishing ...	89
Leather Tanning and Dressing ...	117	Boot and Shoe Making ...	71
Gold Refining ...	197	Plate and Jewellery Making ...	94
Paper Making ...	111	Printing and Bookbinding ...	88
Grain-Milling ...	178	Baking ...	104
Railway Carriage and Wagon Building	123	Carriage and Cart Making ...	82

It should also be observed that a considerable number of outworkers was employed in the brass, boot, and plate trades, and that the net output has been calculated per head of persons employed, excluding outworkers.

(3) A large net output per head is also found in cases where the output consists chiefly of patented or proprietary articles or of articles protected by trade marks or by the reputation of the makers, and there is a heavy expenditure by the manufacturers on advertising and other sales expenses. For example, the following trades may be taken:—

	Net Output per Head.
	£
Spirit Compounding ...	354
Ink, Gum, and Sealing Wax Making ...	280
Spirit Distilling ...	227
Paint and Varnish Making ...	198
Oil Distilling and Mixing ...	189
Chemicals and Drugs, Making and Compounding ...	183
Farinaceous Products Making ...	174
Cattle Foods Making ...	158
Tobacco Preparing ...	155
Fertilizers, Making and Mixing ...	154



In sugar-refining, where the net output per head is £506, and brewing, where it is £485, duty is included in the net output. It should be noted that in several cases the influence both of heavy capital expenditure and heavy sales expenses should be taken into account, and that in the tobacco trade where the net output is the lowest of the group the proportion of females employed is considerable.

(4) The net output per head will vary also with the magnitude of other establishment charges, being, for example, much lower in the case of a "private" dressmaker employing a few girls in a private house than in the case of a West End dressmaker who has to provide for a heavy rent out of net output; in West End houses, moreover, both wages and profits are higher.

(5) Where the raw material is subject to speculative changes in price, net output will be affected, being high where the manufacturer has been able to purchase materials on favourable terms and sell on a rising market, and low where he has had to buy his materials at a high price and sell his goods in a falling market. This may be illustrated by the case of the metal trades, and the following Table shows the variation in the price of lead, tin, and copper, as quoted in the *Economist*, during the period covered by the Census:—

Dates for Quotations.	Lead. English Pig.	Tin. English Bars.	Copper. Tough Cake.
	£ s. d.	£ s. d.	£ s. d.
July 1st, 1906 ... ..	16 18 9	184 5 0	87 5 0
January 1st, 1907 ... ..	20 3 9	197 0 0	106 17 6
July 1st, 1907 ... ..	20 10 0	192 10 0	104 0 0
January 1st, 1908 ... ..	14 7 6	123 10 0	63 15 0
April 1st, 1908 ... ..	14 12 6	145 10 0	63 15 0
July 1st, 1908 ... ..	12 18 9	127 10 0	61 0 0

Oil-seeds and hides are also subject to speculative influences. The relatively high net output per head in 1907 in such trades as seed crushing (£180), copper smelting (£137), lead, tin, and zinc working (£133), and leather tanning and dressing (£117) appears to indicate that the favourable conditions of buying and selling outweighed on the whole the unfavourable conditions, though it may be pointed out that both favourable and unfavourable movements were indicated by different groups of Returns in the same trades.

(6) Where the trade for the year has been bad the net output may be expected to fall below the average of trades of a similar structure. Thus, in 1907, the shipbuilding industry was in a depressed condition, and the net output per head was only £98 compared with £109 in engineering, and £115 in iron and steel smelting, rolling, and founding.

(7) Where work is intermittent or limited to one season of the year, the net output per head will be low compared with that in trades which are active for the whole of the year. Examples are flax-scutching (£19) and fish-curing (£30), which are occupations confined to quite short periods, and velvet and fustian cutting (£32) where employment is exceedingly irregular.

(8) In some cases, the net output per head as shown is high because certain elements included in the calculation in ordinary cases are omitted. Thus, in the printing and publishing of newspapers the net output per head is shown as £190, but this is a fictitious figure, since only the editorial, management, permanent reporting, and printing staffs are included in the persons employed and contributors not solely and fully employed on the newspaper are excluded. Again, in coal-mining the net output is £127 per head and in iron-mines under the Metalliferous Mines Act the net output per head is £155, but the value of the coal and iron ore in the mine is not included in the cost of materials, an omission which is only partly compensated by the inclusion in the net output of the royalties which have to be paid in respect of such coal and ore.

Although illustrations have been given of the different types of variations in the net output, it must be remembered that they are seldom found in isolation. Thus, the employment of females, low capital expenditure, and intermittent employment coincide with a low net output in the clothing trades, while in the textile trades the employment of women balances the heavy capital expenditure in its effect on net output.

The average net output per head gives a somewhat fictitious representation of the condition of a trade. Few industries are so simple in structure that the same conditions apply with little variation throughout, and to obtain a true picture of their economic condition it would be necessary to break them up into their component sections. Thus, the clothing and millinery trades include the following divisions: Factories engaged in

the wholesale manufacture of ready-made suits, costumes, blouses, &c.; West-End tailors and dressmakers doing a high class order trade; other tailors and dressmakers doing a bespoke trade of various grades; drapers with workrooms where goods purchased in their shops are made up; workshops working for the trade on materials given out to them by factories, wholesale houses, or retail drapers; tailors and dressmakers working individually on their own account mainly on materials supplied by their private customers. The output of the last class does not come within the scope of the Census at all. The millinery trade may be similarly divided, with the additional complication that it is sometimes associated with dressmaking or retail drapery and sometimes not. All these classes vary in the rates of wages and salaries paid, in the amount of rent and other establishment charges, in the capital outlay, in the credit given, in the regularity of work, and in the amount of profit expected. It would be possible to analyse the industry into a number of groups with net outputs ranging from about £35 per head (out of which the establishment charges of a small workshop would have to be met) to some hundreds of pounds per head in cases where wages and establishment charges were both very high.

Again, in the gold, silver, electroplate, and jewellery trades some firms make for sale through their own retail shops, others for sale to wholesale dealers or factors (the Birmingham trade), others for sale direct to shopkeepers (the London trade); others work "for the trade" for manufacturers who give out material to be worked up; others, again, do a repairing business, either solely or in conjunction with a retail shop; and others again combine two or more of these classes. Here there is a great variety in the capital outlay and sales expenses, and, taking the industry as a whole, the net output of the larger and better-class firms is weighed down by the great number of small businesses where the employer's gains afford him little more than the wages of skilled labour and the rent of his premises.

It should also be noted that the net output per head as shown in the Tables fails to register the true condition of a trade in those cases where the average of the numbers of persons employed on the four specified days does not give the true average for the year. For example, in seasonal trades where the four selected days do not yield a fair representation of the slack and the busy seasons a false average will be shown.

Accordingly, it must be remembered that while the net output for a trade represents a fact, *i.e.*, the value added to materials by capital and labour, the average net output per head of persons employed is only a rough measure by which to compare different trades and should only be used for this purpose with great caution.

#### THE POWER EQUIPMENT OF INDUSTRY.

Manufacturers were required to state (a) the capacity of the engines owned by them, (b) the capacity of dynamos driven by such engines, (c) the amount of electricity generated by such engines, and (d) the amount of electricity purchased. Firms that rented all or part of their power were not required to furnish particulars of such rented power but only to give the name of the landlord or other person from whom power was obtained. A special Schedule was then addressed to those factory owners and lessees who furnished power to their tenants requiring them to state the kind and capacity of their engines and the number of persons employed about the engines. As those tenants were frequently engaged in different trades, and sometimes in occupations not coming within the scope of the Census of Production, it is not possible to distribute power rented between the various industries. The great majority of factories renting power were engaged in the textile trades.

Manufacturers were instructed to include all engines at their works whether in actual use or "stand-bys," and to state as their capacity either (a) the horse-power which the engines were built to produce, or (b), where an indicator was used, the indicated horse-power at full load.

The total horse-power owned by firms and authorities with a gross output valued at £1,574,441,000, or by factory owners, &c., who let out power, was, as returned to the Census of Production Office, 10,578,475 horse-power. This figure does not include road rollers, locomotives, &c., of 167,192 horse-power owned by public authorities, or the power (mainly wind or water power), used by small firms with a total gross output valued at £2,269,000, that were not able to state the capacity of their water-wheels, windmills, or other power. Further, factories with a gross output valued at £3,302,000 owned engines of 9,342 horse-power and rented the remainder of their power, while factories with a gross output valued at £27,736,000 rented all their power. The gross output of those establishments which used no mechanical power was returned as valued at £157,618,000.



The capacity of the engines owned by factory owners and others who supplied power to their tenants was only 102,198 horse-power or less than 1 per cent. of the total capacity returned. Altogether there was returned from all sources 10,755,009.

The total amount of electricity purchased was returned as 444,473,000 Board of Trade units, of which 17,000 units were purchased by firms that rented part of their power. In a number of cases, firms (mostly small firms) stated the amount they paid instead of the number of units purchased, and in such cases estimates of the quantities had to be made in the Census of Production Office; the amount so estimated did not exceed two per cent. of the whole.

Out of the 444,473,000 units of electricity purchased about 125,000,000 units were used by railway and tramway companies for traction purposes. The remainder—about 320,000,000 units—represents the quantity of electricity purchased and used for power and lighting purposes by manufacturers and others making Returns to the Census of Production Office, but such persons and firms were not required to distinguish in their Returns between electricity purchased for power purposes and electricity purchased for lighting. The total quantity of electricity produced by electricity supply undertakings was returned as 1,432,101,000 Board of Trade units (free from duplication), of which 240,138,000 units are known to have been sold in 1907 for power purposes (excluding traction). The greater part of this quantity was, in the nature of the case, sold to the manufacturing firms that made Returns of the amount of electricity purchased by them, but a part, comparatively small, would also be sold to warehouses, offices, &c., for operating lifts and other purposes. Deducting the amount known to have been sold for power from the total amount of electricity purchased for lighting and power (excluding traction), there remains about 80,000,000 units, but it is not possible to say how much of this quantity was used for power and how much for lighting, since the Returns of supply undertakings included about 195,887,000 units in regard to which no information was furnished as to the purposes for which they were sold.

The total capacity of dynamos owned by the firms (including electricity supply undertakings) making Returns of their output to the Census of Production Office was stated to be 1,747,672 kilowatts, viz. :—

Capacity of Dynamos driven by :	Kilowatts.
Steam Engines, Reciprocating ... ..	1,285,243
Steam Turbines ... ..	350,586
Other Engines ... ..	111,843
<b>Total ... ..</b>	<b>1,747,672</b>

Particulars regarding dynamos were not asked for in the case of Gas and Water Undertakings and of Local Authorities (except in the case of their electricity departments). Local Authorities and, however, stated that, in connexion with the construction and maintenance work covered by their general Returns, they owned electric motors of 5,945 horse-power.

The capacity of the engines by which the dynamos were actuated is included in the total engine power shown above, so that (taking 1,000 horse-power as equivalent to 746 kilowatts, and allowing on the average about 10 per cent. for losses in conversion) about one-quarter of the total engine capacity measured at 10,587,817 horse-power was used in driving dynamos for the production of electrical energy, and about three-quarters were used directly for driving machinery. The total quantity of electricity generated by those dynamos cannot be stated, as in many cases manufacturers were unable to furnish the required information on account of the imperfection of their records. It appears from the Returns, however, that dynamos with a capacity of 1,551,122 kilowatts were used to produce 2,388,660,000 units of electricity. The relation between capacity of dynamos and production of electricity is in practice not uniform, since in some cases the dynamos were used for the continuous production of power and in other cases only when light was required, so that it would be unsafe to calculate the total amount of electricity generated from the information given in those Returns that furnish particulars. Electricity supply undertakings generated 1,432,101,000 units (a complete Return in respect of their dynamos of 1,020,312 kilowatts capacity), railways and tramways generated 229,819,000 units, and industrial firms generated 726,740,000 units for their own consumption, that being the production from dynamos of 418,344 kilowatts capacity out of a total capacity of 613,984 kilowatts for all the dynamos owned by those firms.

To complete this survey, it may be added that, according to the special Report on Agriculture prepared by the Board of Agriculture and Fisheries, the number of engines or motors used on farms in Great Britain in 1908 for driving machinery or implements (exclusive of engines temporarily hired) was 34,450 engines of 213,525 horse-power, viz. :—

	Number.	Horse-Power.
Steam Engines ... ..	16,959	106,460
Oil Engines ... ..	12,807	84,240
Petrol Engines ... ..	1,347	5,041
Gas Engines ... ..	1,855	9,504
Other and Unclassified Engines ... ..	1,482	8,280
<b>Total ... ..</b>	<b>34,450</b>	<b>213,525</b>

In Ireland, in 1908, according to the special Report of the Department of Agriculture and Technical Instruction, there were 554 gas, oil, and steam engines employed in farm work and 22,524 threshing mills, but their engine-capacity is not stated.

The following Tables summarise for the chief groups of trades the particulars furnished respecting engine-equipment, electricity purchased, dynamos owned, and electricity generated.

#### I. CAPACITY OF ENGINES OWNED AND AMOUNT OF ELECTRICITY PURCHASED.

Group of Trades.	Gross Value of Output.	Steam Engines.			Internal Combustion Engines (gas, oil, &c.).	Water Power.	Other Power.	Total Capacity of Engines.	Electricity Purchased.
		Reciprocating.	Steam Turbines.	Total Steam Engines.					
(a) Factories with their own engines.									
	£000.	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.	1,000 B.T. Units.
Mines and Quarries ... ..	144,551	2,415,841	3,560	2,419,401	23,191	8,295	44,247	2,495,134	3,405
Iron and Steel, Engineering, and Shipbuilding Trades.	367,159	2,109,631	69,577	2,179,208	215,252	21,181	21,800	2,437,441	233,879
Metal Trades, other than Iron and Steel.	90,081	55,612	480	56,092	20,110	7,707	—	83,909	3,877
Textile Trades ... ..	295,077	1,873,169	13,665	1,886,834	39,972	51,612	110	1,978,528	20,883
Clothing Trades ... ..	65,604	46,352	1,727	48,079	35,338	972	417	84,806	11,242
Food, Drink, and Tobacco Trades.	259,744	266,299	3,252	269,551	65,891	42,722	2,007	380,171	24,538
Chemical and Allied Trades...	72,561	182,456	734	183,190	25,709	4,490	1,381	214,770	39,813
Paper, Printing, Stationery and Allied Trades.	59,077	179,762	3,498	183,260	43,192	11,077	44	237,573	31,828
Leather, Canvas, and India-rubber Trades.	31,066	45,613	31	45,644	8,330	870	47	54,891	1,581
Timber Trades ... ..	38,143	113,187	907	114,094	54,293	5,348	78	173,813	7,957
Clay, Stone, Building and Contracting Trades.*	74,716	347,647	6,257	353,904	74,875	4,042	163	432,984	13,564
Miscellaneous Trades ... ..	6,215	3,900	—	3,900	5,274	178	65	9,417	1,561
Public Utility Services†	70,447	1,379,376	427,204	1,806,580	67,630	18,318	312	1,892,840	50,148‡
Factory Owners—Power only	—	99,973	—	99,973	1,120	1,095	10	102,198	175
<b>Total ... ..</b>	<b>1,574,441</b>	<b>9,118,818</b>	<b>530,892</b>	<b>9,649,710</b>	<b>680,177</b>	<b>177,907</b>	<b>70,681</b>	<b>10,578,475</b>	<b>444,456</b>

#### (b) Factories renting part of their power.

	£000.	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.	1,000 B.T. Units.
Iron and Steel, Engineering, and Shipbuilding Trades.	23	40	—	40	—	—	—	40	—
Metal Trades, other than Iron and Steel.	53	65	—	65	—	—	—	65	—
Textile Trades ... ..	3,221	8,627	310	8,937	50	250	—	9,237	17
<b>Total ... ..</b>	<b>3,302</b>	<b>8,732</b>	<b>310</b>	<b>9,042</b>	<b>50</b>	<b>250</b>	<b>—</b>	<b>9,342</b>	<b>17</b>

\* In addition to these particulars, the Board of Public Works, Ireland, returned the following :—

	H.P.
Road Rollers, Locomotives, &c. ... ..	6
Other Engines ... ..	279
Electric Motors ... ..	10
<b>Total ... ..</b>	<b>295</b>

† In addition to these particulars, Local Authorities returned the following :—

	H.P.
Road Rollers, Locomotives, &c. ... ..	22,064
Other Engines ... ..	138,888
Electric Motors ... ..	5,945
<b>Total ... ..</b>	<b>166,897</b>

‡ Excluding current purchased by certain Electricity Undertakings from other Electricity Undertakings.



Group of Trades.	Gross Value of Output.		
	(c) Other Factories and Workshops.		
	Factories renting all their Power.	Power not recorded.	Workshops.
	£	£	£
Mines and Quarries ... ..	—	—	3,475,000
Iron and Steel, Engineering, and Shipbuilding Trades	1,317,000	—	6,692,000
Metal Trades, other than Iron and Steel	287,000	—	3,044,000
Textile Trades ... ..	24,159,000	—	11,104,000
Clothing Trades ... ..	497,000	—	41,882,000
Food, Drink, and Tobacco Trades ...	112,000	737,000*	26,853,000
Chemical and Allied Trades ... ..	175,000	—	2,296,000
Paper, Printing, Stationery, and Allied Trades.	205,000	—	2,026,000
Leather, Canvas, and India-rubber Trades.	195,000	—	3,667,000
Timber Trades ... ..	317,000	—	7,930,000
Clay, Stone, Building and Contracting Trades.	209,000	1,532,000	40,235,000
Miscellaneous Trades ... ..	263,000	—	1,810,000
Public Utility Services ... ..	—	—	6,604,000
Total ... ..	27,736,000	2,269,000	157,618,000

\* Of this amount \$50,000 represents the output of grain mills using only wind or water power.

## II.—CAPACITY OF DYNAMOS AND AMOUNT OF ELECTRICITY GENERATED.

Group of Trades.	Capacity of Dynamos.				Electricity Generated.	
	Driven by Steam Engines Reciprocating.	Driven by Steam Turbines.	Driven by Other Power.	Total.	Capacity of Dynamos covered by Returns furnishing particulars.	Quantity Generated.
	Kilowatts.	Kilowatts.	Kilowatts.	Kilowatts.	Kilowatts.	Thousand B.T. Units.
Mines and Quarries ... ..	109,224	2,585	2,791	114,600	10,008	16,813
Iron and Steel, Engineering, and Shipbuilding Trades.	258,608	37,507	50,558	346,673	307,164	540,724
Metal Trades, other than Iron and Steel.	7,903	402	6,677	14,982	14,002	49,817
Textile Trades ... ..	73,153	4,969	4,164	82,286	58,351	63,933
Clothing Trades ... ..	5,759	1,089	3,203	10,051	7,366	5,605
Food, Drink, and Tobacco Trades	25,039	1,569	4,467	31,075	23,892	34,850
Chemical and Allied Trades ... ..	19,836	336	8,703	28,875	27,202	94,013
Paper, Printing, Stationery, and Allied Trades.	17,712	2,621	6,358	26,691	20,687	37,894
Leather, Canvas, and India-rubber Trades.	5,989	4	467	6,460	4,406	5,772
Timber Trades ... ..	8,332	297	1,689	10,318	5,021	4,515
Clay, Stone, Building and Contracting Trades.	12,490	3,962	3,220	19,672	17,908	35,979
Miscellaneous Trades ... ..	1,129	—	484	1,613	1,394	2,689
Public Utility Services* ... ..	738,572	295,245	18,988	1,052,805	1,052,783	1,495,118
Factory Owners—Power only ...	1,497	—	74	1,571	938	938
Total ... ..	1,285,243	350,586	111,843	1,747,672	1,551,122	2,388,660

\* Exclusive of Gas Undertakings, Waterworks Undertakings, and Local Authorities.

## PRODUCTION IN THE SEVERAL DIVISIONS OF THE UNITED KINGDOM.

The following Table summarises the principal particulars returned to the Census of Production Office regarding the output of the three divisions of the United Kingdom, respecting which the Census of Production Act requires that separate statistics shall be published:—

Group of Trades.	Gross Output.	Materials Used.	Work Given Out.	Net Output	Number of Persons Employed	Net Output per head	Engines Owned.
	Selling Value or Value of Work Done.	Cost.	Amount Paid to Other Firms.	(Excess of Column (1) over Columns (2) and (3)).	(excluding Outworkers).	of Persons Employed (excluding Outworkers).	Total Horse-Power.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	£	£	£	£		£	H.P.
England and Wales	1,490,749,000	868,319,000	19,436,000	602,994,000	5,808,269	104	9,097,869
Scotland ... ..	207,840,000	116,937,000	4,539,000	86,364,000	885,403	98	1,397,733
Ireland ... ..	66,777,000	43,090,000	910,000	22,777,000	291,304	78	259,407
United Kingdom	1,765,366,000	1,028,346,000	24,885,000	712,135,000	6,984,976	102	10,755,009

In addition to the number of persons employed as shown in the Table, about 102,147 outworkers were returned as borne on the books of the employing firms, *i.e.*, 89,966 in England and Wales, 2,792 in Scotland, and 9,389 in Ireland. This total does not represent as many individual persons, many outworkers being on the books of more than one firm. On the other hand, it is probable that the persons actually working for a firm include, in certain cases, members of outworkers' families in addition to the outworkers actually on the firm's books. For these reasons, and as most outworkers are not in constant employment, they have not been taken into account in calculating the net output per head of persons employed, but in comparing the figures given above an allowance should be made for them.

As under the provisions of the Census of Production Act it is necessary to avoid the disclosure of particulars relating to individual firms or entailing the risk of injury to a trade, it has in many cases been found necessary in the Reports on individual trades either to incorporate the particulars relating to Ireland with those for England and Wales or to publish only undivided particulars for the United Kingdom. The same reasons have equally made it impossible even to publish the particulars shown above for some of the groups of industries into which related trades have been arranged, but such particulars as can be given, subject to these conditions, are shown in the following statement.

Group of Trades.	Gross Output.			Average Number of Persons Employed		
	Selling Value or Value of Work Done.			(excluding Outworkers).		
	England and Wales.	Scotland.	Ireland.	England and Wales.	Scotland.	Ireland.
Mines and Quarries ... ..	£ 125,151,000	£ 22,617,000	£ 258,000	829,371	132,096	3,763
Iron and Steel, Engineering, and Shipbuilding Trades.	307,809,000	61,573,000	5,814,000	1,270,913	230,691	37,811
Metal Trades, other than Iron and Steel.	91,493,000	1,790,000	182,000	108,138	5,555	780
Textiles, except "Other Cotton Manufactures."	279,565,000	29,154,000	15,836,000	984,813	141,184	92,355
"Other Cotton Manufactures" ...		9,006,000*			34,692*	
Clothing Trades ... ..	94,056,000	8,737,000	5,190,000	638,159	75,899	42,408
Food and Drink Trades ... ..	205,177,000	31,064,000	27,335,000	319,502	70,968	35,583
Tobacco Trade ... ..		23,870,000*			37,648*	
Chemical and Allied Trades (except Explosives and Ammunition).	63,303,000	6,591,000	1,191,000	103,238	9,274	2,586
Explosives and Ammunition ...		3,947,000*			12,744*	
Paper, Printing, Stationery, and Allied Trades.	50,845,000	8,771,000	1,692,000	268,476	44,440	12,559
Leather and Canvas Trades ...	22,849,000	2,945,000	226,000	53,473	6,208	1,004
India-rubber Trade ... ..		8,908,000*			24,039*	
Timber Trades (except "House Furnishings not of Wood").	31,418,000	7,590,000	1,279,000	180,848	34,480	7,706
"House Furnishings not of Wood"		6,103,000*			16,161*	
Clay, Stone, Building and Contracting Trades.	101,443,000	12,831,000	2,418,000	626,138	80,557	18,545
Miscellaneous Trades ... ..	7,615,000	599,000	74,000	42,584	3,940	350
Public Utility Services ... ..	67,538,000	6,609,000	2,904,000	280,673	29,395	32,423
Factory Owners—Power only ...	—	—	—	806	—	—
Total ... ..	1,490,749,000	207,840,000	66,777,000	5,808,269	885,403	291,304

\* In the case of these trades separate particulars for the several divisions of the United Kingdom are not given in order to avoid the possible disclosure of information relating to certain firms. In the total figures for all trades for England and Wales, for Scotland, and for Ireland separately a distribution of these amounts and numbers has been included.



It has already been pointed out (*see* page 10) that there should be added to the net output of the United Kingdom the sum of about £50,000,000 in respect of about 1,000,000 persons whose output was not returned to the Census Office.

The special Reports on Agriculture (*see* page 1) do not present the agricultural output on quite the same basis, output for Great Britain being taken to mean produce sold off the farm, whereas in the case of Ireland food consumed by farmers' households is also taken into account; in both cases the value of seed and stock-food have been deducted. Certain estimates to make good the missing data, are discussed on pages 23 and 24, but the following statement sets forth only the particulars contained in those Reports:—

	Agricultural Produce. £	Persons Employed.
England and Wales ... ..	127,650,000	1,128,000*
Scotland ... ..	23,150,000	212,000*
Ireland ... ..	45,574,000	984,000†
United Kingdom... ..	196,374,000	2,324,000

In the period covered by these Reports Irish cattle, sheep, pigs, and poultry to the value of about £7,000,000 were sold to Great Britain for subsequent re-sales. Further, dairy produce valued at £5,534,000 (*viz.*, England and Wales £1,916,000, Ireland £3,618,000) is duplicated in the Agricultural Returns and in the Census of Production Returns for creameries and cheese factories.

Particulars as to Fisheries are contained in the Annual Report of Proceedings under Acts relating to Sea Fisheries for the year 1907 (Cd. 4800), the Twenty-Sixth Annual Report of the Fishery Board for Scotland for the year 1907 (Cd. 4125), the Report on the Sea and Inland Fisheries of Ireland for 1907 (Cd. 4298), and the Annual Statement of the Navigation and Shipping of the United Kingdom for 1907 (Cd. 4256). The following statement shows the value of the fish and shell-fish landed and the number of persons regularly or occasionally employed:—

	Value of Fish Landed. £	Persons Employed.	
		Regularly.	Occasionally.
England and Wales ... ..	8,156,000	36,210	7,464
Scotland ... ..	3,221,000	28,951	10,366
Ireland ... ..	341,000	8,027	16,405
United Kingdom ... ..	11,718,000	73,188	34,235

Persons employed in gutting, curing, &c., are not included as persons engaged in fisheries.

\* Excluding occupiers numbering about 500,000 in Great Britain.

† Including farmers.

### THE OUTPUT OF THE UNITED KINGDOM TAKEN AS A WHOLE.

The chief particulars furnished to the Census of Production Office respecting the industries of the United Kingdom are summarised in the following statement, in which the information is classified by groups of allied trades:—

Group of Trades.	Gross Output. — Selling Value or Value of Work Done.	Materials Used. — Cost.	Work Given Out. — Amount Paid to other Firms.	Net Output. — Excess of Column (1) over Columns (2) and (3).	Average Number of Persons Employed, (excluding Out- workers).	Horse- Power of Engines at Mines, Factories, &c.
	(1)	(2)	(3)	(4)	(5)	(6)
	£	£	£	£		H.P.
Mines and Quarries ...	148,026,000	28,495,000	—	119,531,000	965,230	2,495,134
Iron and Steel, Engineer- ing and Shipbuilding Trades.	375,196,000	212,224,000	9,890,000	153,082,000	1,539,415	2,437,481
Metal Trades, other than Iron and Steel.	93,465,000	81,341,000	231,000	11,893,000	114,473	83,974
Textile Trades ... ..	333,561,000	235,038,000	4,189,000	94,334,000	1,253,044	1,987,765
Clothing Trades ... ..	107,983,000	58,185,000	2,125,000	47,673,000	756,466	84,806
Food, Drink, and Tobacco Trades.	287,446,000	197,734,000	198,000	89,514,000	463,701	380,171
Chemical and Allied Trades.	75,032,000	53,466,000	9,000	21,557,000	127,842	214,770
Paper, Printing, Stationery, and Allied Trades.	61,308,000	26,611,000	1,047,000	33,650,000	325,475	237,573
Leather, Canvas, and India-rubber Trades.	34,928,000	26,229,000	81,000	8,618,000	84,724	54,891
Timber Trades ... ..	46,390,000	24,780,000	166,000	21,444,000	239,195	173,813
Clay, Stone, Building, and Contracting Trades.	116,692,000	49,679,000	6,557,000	60,456,000	725,240	433,279
Miscellaneous Trades ...	8,288,000	3,778,000	67,000	4,443,000	46,874	9,417
Public Utility Services ...	77,051,000	30,786,000	325,000	45,940,000	342,491	2,059,737
Factory Owners—Power only.	—	—	—	—	806	102,198
Total ... ..	1,765,366,000	1,028,346,000	24,885,000	712,135,000	6,984,976	10,755,009

The aggregate of the values returned for the gross output of the various trades is £1,765,366,000, which does not include the output of agriculture and fishery. This aggregate, as has been explained, involves a large amount of duplication, and in the Reports which follow an attempt is made to show within as narrow limits as possible the value of the output of each trade, free from such duplication. As the Returns furnished under the Census of Production Act contained no information regarding materials used except their aggregate value, it is not possible to proceed directly to the elimination of duplication between trades, *e.g.*, between the textile trades and the clothing trades, and thus to determine the value of the goods at the stage at which they passed to the final purchasers in the United Kingdom, or were exported, or were added to stock at the end of the census year.

The value added to materials in the course of the processes of manufacture is known from the Returns, being expressed by the net output, and the addition of this net output to the cost of materials obtained by each trade from outside its own borders, were the latter known, would yield the desired information as to the value of the output of each trade, free from duplication, and a like procedure would yield the value of the total output of any group of trades, or of all trades taken together. The cost of materials needed for such a calculation is their cost as delivered at the works where they are worked up, while such information as is available does not show this cost, but in the case of materials obtained from native extractive industries (agriculture and mining) the value has been determined at the place of production, and in the case of imported materials, whether raw or semi-manufactured, the value declared and recorded is the value at the port of landing. The cost of merchanting such goods, and of their conveyance from the port of landing or place of production to the place of manufacture, has not been returned to the Census Office. Further, certain agricultural products, whether native, like oats, or imported, like maize, pass in part directly into consumption, without going through any adaptive process in the United Kingdom, and the value of the products so consumed directly is not accurately known. Consequently, the formation of an estimate of the value of the materials purchased from outside sources by the trades covered by the Census of Production, and hence the value of the output of those trades as a whole, is a problem which must be attacked indirectly. This is attempted in the succeeding paragraphs.



In the first place it will be useful to separate those trades\* which work up at first hand the produce of agriculture and fisheries from the remaining trades covered by the Census Returns. The estimated value of the output of this group of food, drink, and tobacco trades, after deducting the cost of coal used, is a little over 199 millions sterling, free from duplication, the value of the net output being about £62,000,000. Some of the products of this group of trades are dutiable, but duty has been included in the value of the output only in the cases of beer, sugar, and glucose. Deducting the amount of the duties (£15,291,000) in order to reduce all trades to the same basis of valuation, the value of the products of the primary food industries becomes about £184,000,000.

For the remaining food and drink trades (*e.g.*, baking, confectionery, &c.), and the other industries covered by the Returns made to the Census Office, the value of the materials acquired from outside sources may be estimated as stated below. The term materials is here applied to goods which are used in further processes of production covered by the Returns, and all goods are treated as finished products at that stage of record in the Returns after which they go through no further process of manufacture:—

Value at place of production of raw materials of United Kingdom origin, produced by trades not covered by the Census of Production ( <i>i.e.</i> , timber, wool, flax, hides, and skins; old iron, steel, copper, brass, lead, bones, paper, and rags†) retained in the United Kingdom ... ..	£ 18,500,000
Value at port of landing of imported raw and semi-manufactured materials (including bullion) used in industries other than primary food industries ...	310,700,000

To the value of materials, namely, £329,200,000, there should be added the net output of all trades except those in the group already discussed, that is to say about £650,100,000. To the resulting total of about £979,300,000 should also be added the net output of workers coming within the scope of the Census of Production, but in respect of whom Returns were not secured (*see* page 10), or about £50,000,000. The values assigned in this statement to native and imported materials of industry are those which were recorded at the places of production and at ports of landing respectively. To obtain their value at the places where they were worked up there must be added landing charges on imported materials, carriage of materials from the port of landing or place of production to the works where they were used, carriage of partly manufactured materials between one works and another until they reach what, for the purposes of the Census, is their final form, and the charges and profits of merchants at the various stages. Thus, the merchants dealing in raw cotton, in yarn, and in cloth, are all involved where cotton piece goods are in question, and carriage in that case includes carriage from port to spinning mill, from mill to weaving shed, and thence to the bleacher, dyer, or printer. In the case of wool goods, carriage of imported wool from the port to the manufacturing district, carriage between the works of the comber, spinner, weaver, dyer, and finisher, and carriage of the cloth to London and other centres of population where it is made into apparel, have all to be taken into account, besides the charges of the wool stapler and the cloth merchant.

It is not possible to state with exactitude the sum which should be added for all these elements of carriage and for merchants' charges and profits. Whatever its amount, being included in the value of materials as received at the works, it is not included in the net output. Accordingly, in calculating the final value of the completed goods, there should be taken into account not only the value of materials in the stage at which they are first handled by any of the firms making Returns to the Census Office and the value added in the manufacturing processes (*i.e.*, the net output), but also the equivalent of these transportation and mercantile charges on materials, both raw and semi-manufactured, native and imported.

So far as transportation is concerned, it may be noted that the total railway receipts from goods traffic amounted in 1907 to £59,700,000, *i.e.*, £29,400,000 from minerals and £30,300,000 from general merchandise. What fraction of this total is concerned with the materials now under consideration can only be roughly estimated, while charges for materials (such as coal) used in the railway service and accounted for as output of sundry

\* Milling, cocoa manufacture, fruit preserving, butter and cheese making at creameries, fish-curing, bacon-curing, meat preserving, pickle and sauce making, sugar refining, brewing, spirit distilling, making of cider, British wines, and sundry beverages, and tobacco manufacture.

† The old iron, steel, copper, brass, lead, bones, paper and rags included above represent in the main the refuse of consumption and are not included in the Returns made to the Census Office.

industries in the Census Returns should be taken into account in estimating the part of the gross receipts which represents in the case of railway services the element corresponding to what has been designated "net output" in manufacture. In addition to carriage by railway, the cost of canal carriage, of coastwise shipments, and of general cartage must also be taken into account, subject to corresponding deductions for materials derived from industries covered by the Census, in arriving at the total amount spent on the transport of goods. Merchants' charges and profits appear to range from 2½ to 10 per cent. of the value of the goods handled.

Deducting the value of imported bullion (*see* page 25) from the total of £329,200,000 specified above as the value of materials including bullion, there is left £285,600,000, and it appears reasonable to add from 10 to 15 per cent. of this sum to cover carriage to and between works and merchants' charges and profits. The resulting allowance of from 28 to 43 million pounds sterling for carriage and merchandising of materials cannot be regarded as excessive, since no further addition is made for like charges on semi-manufactured goods of native origin which are worked up in other establishments than those in which they are produced. With this addition, the "selling value at works" of the goods at present under consideration may be estimated as lying between 1,057 and 1,072 million pounds sterling. The value of the products of the primary manufactured food trades, £184,000,000, being added, the value at works of the final products of the industries within the scope of the Census of Production may be estimated to be between £1,241,000,000 and £1,256,000,000 (exclusive of duties).

In this total there is included (1) the selling or contract value of all goods made or work done by manufacturers, miners, builders, contractors, public authorities, &c., and (2) the amount returned to the Census Office as received from merchants and private persons for work done on materials supplied by them (the value of the materials being also included as products of manufacture or as imports). The equivalent of the manufacturers' profit, which would have resulted if the goods so made for merchants had been made for manufacturers, is not included; and it is not possible to estimate its amount.

The net output realised, after deducting the duty on beer, sugar, and glucose, and including the estimate of £50,000,000 in respect of persons for whom Returns were not secured, was nearly £747,000,000.

The goods whose value, free from duplication, is expressed by the total of £1,241,000,000 to £1,256,000,000, include (*a*) all mineral products, all raw materials other than agricultural and fishery products for direct consumption, and all manufactured goods taken at the stage in which they were consumed, exported, or warehoused at the end of the censal year, and (*b*) all building and public works executed by private firms, local authorities, and railway and similar companies. It may be pointed out that, in making this calculation, a building is regarded as a final product, while the bricks, timber, &c., used in its construction are treated as semi-manufactured products. In instituting comparisons between home production and foreign trade, it might appear proper to exclude such domestic industries as those engaged in building, but in view of the fact that bricks, timber, and other structural materials can be, and are, exported and imported, and that the building trade competes for capital and labour with trades directly engaged in producing for export, such an exclusion has not been made on pages 25 and 26. Similar considerations may be applied to such cases as the production of gas, water, and electricity, and to the laundry and the newspaper printing trades.

Having arrived at an estimate of the total output of industries included in the Returns made to the Census Office, it remains to consider the output of agriculture and fishery. For Great Britain the Board of Agriculture and Fisheries undertook an enquiry on a voluntary basis, and for Ireland the Department of Agriculture and Technical Instruction procured the necessary information, also without compulsory powers. In the special Reports on these Agricultural Enquiries the value of agricultural produce of all kinds sold off the farms of Great Britain is estimated to be £150,800,000 and for Ireland £45,574,000, the latter figure including the estimated value of the products consumed by the households of the producers as well as of similar products sold. As cattle and other animals and poultry were sold from Ireland to British farmers for fattening, a sum of about £7,000,000, representing their value, is included in both amounts. Further, dairy products to the value of £5,534,000, included in the Returns for agriculture, were also included in the sum of £6,562,000 representing the output of such products by creameries and cheese factories as returned to the Census of Production Office. It will be convenient to exclude this last sum from the industrial total, and transfer the whole to the agricultural total, the addition of the balance of £1,028,000 (less the cost of the milk required for its production, which is included in the agricultural output and may be estimated at about £680,000) thus producing an aggregate of £189,700,000.



In considering this total it should be observed that, as appears from the Report on the Agricultural Output of Great Britain, it excludes (a) the value of dairy produce and cider consumed by farmers' households in Great Britain, which may be estimated at about £3,500,000; (b) the value of the hides of cattle and of horses which died in the censal year, estimated to amount at about £300,000; (c) the output of farm, market-garden, and fruit crops from holdings not exceeding one acre; (d) the production of certain crops under glass; (e) the production of pigs, poultry, and eggs from holdings not exceeding one acre, or in towns or by cottagers and others not coming within the definition of occupiers of agricultural holdings; and (f) the poultry and eggs consumed by the families of their owners. No precise calculation can be made of the amount which should be added in respect of the last four items, but it appears not unreasonable to estimate the value of the total agricultural and garden output of the United Kingdom at about £210,000,000.\*

Utilising the information available for the formation of estimates of the value of the hides and skins of animals sold off farms for slaughter, of the hides of cattle and of horses used in agriculture which died in the censal year, and of the "skin wool" on sheep and lambs killed in the year of return, the following analysis of agricultural produce raised in the United Kingdom may be presented:—

	Value at Farms.
	£
Food and Fodder Products, Flowers, Seeds, and Plants	195,700,000
Horses and Animals not for food	3,400,000
Hides and Skins...	6,000,000
Wool	3,600,000
Timber	900,000
Flax	400,000
Total	£210,000,000

The value of fresh fish and shell fish landed in the United Kingdom is returned as £11,718,000 (Annual Report of Proceedings under Acts relating to Sea Fisheries for the year 1907, Cd. 4,800, page 53).

Bringing together the totals already obtained, and adjusting for the transfer of butter and cheese from the industrial total to the agricultural, we have, for the value of the output:—

	Million £ sterling.
Output of Industry	... 1,234 to 1,249
„ „ Agriculture	... About 210
„ „ Fisheries	... About 12

or a total of £1,456,000,000 to £1,471,000,000.

In the output of Agriculture there are included items amounting in the aggregate to £30,600,000 which represent materials for the manufactured food trades, and £9,400,000 which represent materials for other trades. In the output of Fisheries there is included £2,000,000 representing fish which served as materials for the fish-curing industry; in the output of Industry there is included £26,600,000 representing manufactured animal foods and £2,200,000 representing manufactured manures used in agriculture, and £100,000 representing materials used in fishery. Thus a total of £70,900,000 is recorded twice in the total, and after adjusting for this double record, the output of the United Kingdom may be estimated at a sum lying between £1,385,000,000 and £1,400,000,000. This sum represents, so far as it relates to goods which pass through the hands of merchants, whether wholesale or retail, the value of such goods before handling by such merchants. The processes of tea blending and packing, coffee roasting, grinding, and packing, coffee and chicory mixing, grinding and mixing provender, blending spirits, bottle-washing, cleaning and sorting of fruit and seed, sorting and breaking of old metal, and the packing, labelling, and carding of goods have been treated as incidental to the selling of the goods, and the trades where these occupations were carried on were excluded from the Census. Consequently, the value added to goods by these processes is not included in the amount stated above as the aggregate value of the products, nor are the profits and charges of merchants, wholesale and retail, in respect of the finished goods, nor the cost of carriage of those goods from the place of manufacture to the place of final sale for consumption, nor are Excise or Customs duties

\* This estimate is supported by the figures given in Mr. R. H. Rew's paper on "The Nation's Food Supply," read before the British Association in September, 1912, where the value of the home produce consumed as food in 1911 is estimated at £180,000,000.

on the goods or their materials included. The total represents the "factory value" or the value at the point where the mining, agricultural, manufacturing, or other processes are completed, after which such of the goods as are exported undergo no change of nature, and any change undergone by the goods consumed in the United Kingdom is due to the work of consumers themselves or the members of their households, or of the staffs of hotels, restaurants, hospitals, &c., where goods are prepared for consumption in such enlarged households.

The aggregate value of the produce of the United Kingdom, as stated above, lies between 1,385 and 1,400 million pounds sterling, taken at point of production. The exports of the produce and manufactures of the United Kingdom in 1907 were valued at £426,000,000, free on board, and the net imports (*i.e.*, imports less re-exports) of foreign and colonial merchandise in the same year were valued at £553,800,000 at port of landing. The exports however include £1,500,000 in respect of scrap iron and rags which are mainly not by-products of manufacturing industry but waste collected from domestic consumption; consequently, they should be deducted when a comparison is made. Secondly, the exports and imports of coin and bullion are not included in the values stated above for exports and imports. The value of unrefined gold bullion and of silver bullion which formed part of the materials of the gold and silver refining trades (the products of which were included in the Returns made to the Census Office) is estimated to be about £43,600,000 and this sum should be added to the value of imports as shown above. There should also be added to the exports £39,400,000, the estimated value of gold and silver bullion refined in the United Kingdom and exported, and of British gold and silver coin exported (on balance), less the net imports of foreign and colonial silver coin (valued as bullion), so far as these may be taken to represent the produce of the imports refined in private works, whether they subsequently passed through the Mint or not. These sums of £43,600,000 and £39,400,000 are not the total imports and exports of gold and silver, such coin and bullion being excluded as appear to have been exported in the same condition as that in which they were imported. After the foregoing adjustments have been made the value of the exports is raised to £463,900,000 and the value of the net imports to £597,500,000. The imports of diamonds not being included in the Trade Returns, and their polishing, &c. not being included in the Census of Production Returns, no account is taken of the diamond industry in the above discussion.

In the following Table there are presented figures comparing the value of the output of the United Kingdom (using the lower figure of the preceding estimates) with that of exports and of net imports (*i.e.*, imports less re-exports). The figures are arranged in groups within which the effects of duplication have been eliminated so far as each group by itself is concerned. Thus, in "agriculture" the value of crops used for stock-food and of grain used for seed has been deducted, and in "mines and quarries" the value of coal used in the operation of the mines and quarries has also been deducted.

	Output.				Net Imports.*
	Value at place of Production.	Sold for Direct Use or Consumption.	Sold as Materials for Other Groups.	Exported. Value, free on board.	
	£ million.	£ million.	£ million.	£ million.	£ million.
1. Agriculture	210·0	165·6	40·0	4·4	208·1
2. Fishery	11·7	9·0	2·0	·7	·8
3. Mines and Quarries	128·6	39·0	47·6	42·0	64·0†
4. Manufactures, Buildings, and Public Works.	1,165·9	707·5	41·6	416·8‡	324·6
Total	1,516·2	921·1	131·2	463·9	597·5

\* *I.e.*, imports less re-exports.

† Including net imports of unrefined gold bullion and of silver bullion for use in industry.

‡ Including exports of gold and silver bullion refined in the United Kingdom, and exports (on balance) of British gold and silver coin, less the net imports of foreign and colonial silver coin (valued as bullion).

Deducting the total sold to other groups (and so duplicated in the value of the output of those groups) from the total value of the output, there is left £1,385,000,000 as already shown.

It will be of interest to re-arrange the figures given in the foregoing Table so as to distinguish between food and other produce and also between raw materials or natural products, semi-manufactured materials, and finished goods, irrespective of whether those products or goods are derived from agriculture, fishery, mines, or manufactures. This



fresh analysis is given in the Table below, and in considering it the following points should be borne in mind:—(1) The group of "Agriculture" in the preceding Table has been distributed between the headings of "Food, &c.: Natural Products," "Animals not for Food," and "Other Raw Materials," the latter heading covering hides, skins, wool, timber, and flax (all transferred from "Agriculture"), as well as old iron, steel, copper, brass, lead, bones, paper, and rags collected from consumption and used in the British metal and paper trades. (2) The group "Fishery" has been combined with "Natural Products" and the group of "Mines and Quarries" has been split up into "Coal" and "Other Mine and Quarry Products." (3) The group "Manufactures, Buildings and Public Works" has been split up into "Food, Drink, &c.: Manufactured Goods," "Semi-Manufactured Goods," and "Goods in their Final Stage, Buildings, and Public Works." (4) Each line in the new Table is free from duplication within itself, but contains items which are duplicated under other headings. Thus, the output of "Food, &c.: Natural Products" (£207,400,000) includes grain, fish, &c., to the value of £32,600,000 which are also included in the value of "Food, &c.: Manufactured Goods."

	Produced in the United Kingdom.				Net Imports. (Imports less re-exports.)		
	For Direct Con- sumption or Use.	Used as Materials.	Exported.	Total.	For Direct Con- sumption or Use.	Used as Materials.	Total.
1. Food, Drink, and Tobacco; Fodder; Seeds, Plants, and Flowers:—	£	£	£	£	£	£	£
(a) Natural Products... ..	million.	million.	million.	million.	million.	million.	million.
(b) Manufactured Goods ... ..	172.7	32.6	2.1	207.4	107.4*	62.7	170.1*
Total ... ..	208.5	3.4	20.1	232.0	61.5	13.1	74.6
2. Animals not for Food ... ..	381.2	36.0	22.2	439.4	168.9	75.8	244.7
3. Raw Materials:—	1.9	—	1.5	3.4	.3	—	.3
(a) Coal ... ..	—	—	—	—	—	—	—
(b) Other Mine and Quarry Products ... ..	38.8	35.6	40.2	114.6	—	—	—
(c) Other Raw Materials ... ..	.2	13.0	1.8	15.0	1.1	62.9	64.0†
Total ... ..	—	18.5	1.5	20.0	—	128.1*	128.1*
4. Semi-manufactured Goods ... ..	39.0	67.1	43.5	149.6	1.1	191.0	192.1
5. Goods in their Final Stage, Build- ings, and Public Works ... ..	—	‡	220.7	220.7	—	110.1	110.1
General Total ... ..	499.0	41.6	176.0§	716.6	49.7	6	50.3
	921.1	144.7	463.9	1,529.7	220.0	377.5	597.5

\* £867,000 the estimated value of the hides on cattle imported for slaughter has been transferred from the value of animals to the value of other raw materials.

† Including net imports of unrefined gold bullion and of silver bullion for use in industry.

‡ The value of the semi-manufactured goods made and used for further manufacture in the United Kingdom cannot be stated; only part of those goods was sold at the semi-manufactured stage.

§ Including exports of gold and silver bullion refined in the United Kingdom and exports (on balance) of British gold and silver coin, less the net imports of foreign and colonial silver coin (valued as bullion).

|| *i.e.*, manures sold to agriculture and explosives and other materials sold to mines and quarries.

The sum of £1,385,000,000 for the total output of the United Kingdom, free of duplication, may, as already calculated, understate the value of the output by an amount which may be as great as £15,000,000, the cost of transport of materials and of merchandising not being determinable within a limit of approximately that amount. The value of output is recorded as at place of production, while the value recorded for exports is their value free on board, *i.e.*, including carriage to the port of shipment and other charges. Consequently, the value of products made or grown in, and consumed in, the United Kingdom (obtained by deduction of the value of exports from the value of the total output), which is shown in the foregoing Table as £921,100,000, is too small and should be increased by the amount by which the free-on-board value of the exports exceeds their value at place of production. A sum probably lying between 34 and 54 million pounds should be added on this account.

It appears from the above Tables that the value (at port of shipment) of the exports of United Kingdom produce and manufactures in 1907 was approximately 33 per cent. of the value (at place of production) of the output of the United Kingdom, taken as a whole and free from duplication. Similarly the imports of the year, less re-exports, valued

at port of landing, amounted to about 43 per cent. of the value (at place of production) of the output of the United Kingdom. It must be remembered, however, that about 57 per cent. of the exports and about 63 per cent. of the retained imports consist of classes of goods (including coal) which, whether raw or partly manufactured, are materials for manufacture, building, &c. In the gross value of the United Kingdom output such goods are included in all cases in which they were sold at a stage when the manufacturing process was not complete, but in the Table on page 26 and in the total already given for the output of the United Kingdom as a whole (£1,385,000,000 to £1,400,000,000) such goods are only included when they were sold for export, the value of the remainder being included in the value of finished goods that underwent no further process of manufacture in this country.

Owing to the difficulty of determining in some cases whether the materials of exported goods were native or imported, a figure bearing to exports a relation similar to that borne by "net output" to the estimate made of the value of the output of the United Kingdom as a whole cannot be satisfactorily calculated. It is, however, of interest to note that the value (at port of shipment) of the exports of United Kingdom produce in 1907 was approximately 23 per cent. of the gross value (at place of production) of the output of the United Kingdom, and that similarly the imports of the year (less re-exports), valued at port of landing, represented a total which amounted to about 30 per cent. of the gross value of the output of the United Kingdom, including industry, agriculture, and fishery.

Probably the difficulty in regard to the selection of figures relating to oversea trade and to production which are really comparable may be best met by bringing together for comparison only the figures relating to goods of one or other of the classes separately grouped in the Table on page 26. The following statement sets forth the more salient of such figures:—

	Percentage of United Kingdom Output.	
	Exports (1907).	Net Imports (1907).
1. Food, Drink, Fodder, Seeds, Plants, Flowers, and Tobacco (Natural and Manufactured Products, omitting duplicated items).	5 per cent.	60 per cent.
2. Raw Materials of Industry ... ..	29	128
3. Finished Products of Industry ... ..	25	7

The omission of the group of semi-manufactured goods has already been explained. The exports of food products (chiefly manufactured goods) in 1907 represented only 5 per cent. of the output of such products in the United Kingdom, while the net imports amounted to about three-fifths of that output. Over 30 per cent. of the imports of food products consisted of materials to be further worked up in the United Kingdom.

The exports of "raw materials of industry" in 1907 consisted almost entirely of coal which represented about 92 per cent. of the total value, while the imports of coal were trifling. Part of the exported coal was for domestic consumption abroad, and a further part was for the use of steamships (largely British) in foreign waters. The imports of raw materials in 1907 amounted in value to nearly three-tenths more than the value of the raw materials of industry produced in the United Kingdom.

The exports of finished products of industry constituted in 1907 nearly 38 per cent. of the exports of the United Kingdom and were nearly 3½ times the value of the net imports of similar goods, which in turn constituted only about one-twelfth of the value of net imports of all classes.

It may again be repeated that, for the purpose of the above comparisons of exports and imports with production, those exported or imported goods alone have been treated as "finished" which correspond to goods classed as "finished" in the summaries of the Returns of output, in which no goods used as materials in a further process of production or construction are classed as "finished." The classification of exports and imports in the foregoing Tables differs, therefore, from that adopted for the purposes of the Annual Trade Returns. A comparison of the two classifications is given in the Appendix on pages 923 to 926.

As already stated, the value of the output of the United Kingdom has been calculated free from duty. The Customs duties on goods used in manufacture in the United



Kingdom and the Excise duties on excisable goods made in the United Kingdom were as follows :—

	£.
Sugar, British refined, entered for Home Consumption ...	1,980,000
Molasses, British made ... ..	73,000
Glucose, British made ... ..	121,000
Saccharin, British made ... ..	14,000
Sugar, Refined and Unrefined, and Molasses, imported for use in industry (estimated) ... ..	1,650,000
Glucose, imported ... ..	129,000
Saccharin, imported ... ..	36,000
Cocoa, Raw, imported ... ..	186,000
Tobacco, Raw, imported, less drawbacks on British Manufactured Tobacco (including duty on Cavendish manufactured in bond) ... ..	13,216,000
Beer, British made ... ..	13,117,000
Spirits, British made ... ..	17,706,000
Perfumed Spirits, imported ... ..	35,000
Total ...	48,263,000

The duties on British-made sugar and molasses and on imported cocoa, glucose, saccharin, and perfumed spirits are those collected in the calendar year 1907, the other amounts relate to duties collected in the twelve months ended 31st March, 1908, less drawbacks on exports. The value of goods sold for use within the country being inclusive of duties, the value of the output of the United Kingdom, reckoned at the point where the agricultural, mining, manufacturing, or other processes are completed and distribution for final consumption or export begins, may be estimated at a sum lying between £1,433,000,000 and £1,448,000,000, viz., £1,385,000,000, to £1,400,000,000, as already stated, plus about £48,000,000 for duties.

The goods whose value at the place of production (including duties) has been estimated above as lying between £1,433,000,000 and £1,448,000,000, together with such imported commodities as pass into consumption without undergoing any previous manufacturing process (whose value at port of landing amounted to £220,000,000), constitute the supply of commodities from which the material needs of the population are met and the exports to other countries (valued at £463,900,000, free on board) are provided. Allowing for the difference between factory values and export values (see below), the value of the goods consumed in the United Kingdom would thus appear to be expressed by a sum lying between £1,223,000,000 and £1,258,000,000. This sum, however, though it covers the whole of the goods available for consumption, does not represent their value when they pass into the hands of the consumers, but their value at the factory or port. Though the goods produced are the goods consumed, subject to the deduction of exports and the addition of certain imports as mentioned above, the expenditure of the consumers in procuring supplies of material goods for consumption is not measured by the value of those goods at the place of production. The cost of distribution, including transportation from the works or ship to the place of consumption and the charges and profits of the merchants through whose hands they pass, as well as the cost at the works or ship, is covered by the charges made to the consumer. In view of the fact that, apart from any variations in the stocks of finished goods which occurred in the census year, the output furnishes the material equivalent of the expenditure of the income of the inhabitants, it appears desirable to indicate the extent of the additions to value in distribution, even though the indications given must be treated as tentative only owing to the absence of exact information on many of the points involved.

(i) With regard to the exports, valued free on board at £463,900,000, the transport charges between works and port of shipment and the profits and charges of merchants may be taken to be covered by from 10 to 15 per cent. of the value of the goods (except in the case of new ships, coin, and bullion), so that the value at works of the exported goods may be taken as lying between £410,000,000 and £430,000,000. There thus remains, of the goods produced in the United Kingdom, a value of between £1,003,000,000 and £1,038,000,000 after deduction of exports. These goods consist of the following three classes :—

(ii) (a) Goods included in the Returns to the Census Office of such a nature as to be ready for consumption without passing through merchants' or retailers' hands, and as

not subject to outside charges for carriage, *i.e.*, gas, water, electricity, job printing, bread, laundry work, ships, building and contracting work; warships, ordnance, buildings, etc., constructed by Government Departments; works of construction, upkeep, and repair executed by the employees of local authorities and of railway, tramway, canal, dock, and similar companies; and farm and garden produce consumed by the families of the cultivators. The total value of such goods, so far as they have been identified in the Returns to the Census Office or have been estimated in the case of agriculture, is about £310,000,000.

(b) Goods which usually pass through merchants' hands and are subject to transport charges, but which do not as a rule pass through retailers' hands, such as certain classes of machinery. Their value at works, so far as they can be identified in the Returns to the Census Office, is about £105,000,000; and they may be estimated to cost the final purchasers about £120,000,000.

(c) Consumption goods passing through merchants' and retailers' hands. As the goods of the two preceding classes have been valued at £415,000,000 at works, there remains for this third class a value lying between £588,000,000 and £623,000,000. To this sum should be added carriage from manufacturer to merchant, from merchant to retailer, and from retailer to consumer, merchants' charges and profits, and retailers' charges and profits. After taking cost of carriage into account it appears reasonable to assume that a sum between 300 and 400 million pounds sterling, *i.e.*, an addition of one-half to two-thirds to the works value of goods passing through retailers' hands, will express the limits between which the total cost (including profits) of distribution of such goods lies. This assumption is borne out by various limited enquiries which have been made and by other evidence, but it must be pointed out that it is not susceptible of exact proof.\* The cost to their ultimate purchasers of consumption goods made and retained in the United Kingdom may thus be roundly estimated as between £900,000,000 and £1,000,000,000.

We thus get the following statement :—

Value at works :	£ million.
Export Goods ... ..	430 to 410
Goods made and consumed in the United Kingdom...	1003 to 1,038
	1,433 to 1,448
Value added in transport and distribution :	
To Export Goods ... ..	34 to 54
To Goods made and consumed in the United Kingdom	315 to 415
	1,782 to 1,917

Taking all the above elements into account, it may be estimated that the value of the output of the United Kingdom in 1907 when finally sold for consumption or export lay between £1,782,000,000 and £1,917,000,000, and that the value of goods of United Kingdom manufacture sold for consumption in the United Kingdom lay between £1,318,000,000 and £1,453,000,000.

There still remain imported goods not for further manufacture but for consumption, valued at port of landing at £220,000,000. From this sum must be deducted about 3 million pounds sterling in respect of imported grain and manures directly consumed in agriculture and duplicated in the value of agricultural products. On the other hand there must be added a sum of £15,200,000 for customs duties on imported goods, not already taken into account, together with the merchants' profits on that expenditure. On the same basis as above the value to the final purchaser of the imports now under consideration (allowing only carriage and wholesale profits and expenses on £8,000,000 of goods, corresponding to class (ii) (b) above) may be estimated to lie between £345,000,000 and £380,000,000.

\* The accounts of the English Co-operative Wholesale Society show that the expenses of their wholesale business range from  $1\frac{1}{2}$  per cent. on purchases in the case of grocery (where the transactions are on a very large scale) to 5 or 8 per cent. in the case of other goods. The Wholesale Society does not work for a commercial profit. Examination of the accounts of a considerable number of large distributive co-operative societies, working in competitive districts, shows that profits and expenses together run between 20 and 35 per cent. of the cost of purchases, from 8 to 12 per cent. representing expenses. Enquiries made by the Census of Production Office regarding ordinary retail trade show that, when allowance is made for certain cases where the sum required to cover retailers' expenses and profits may fall as low as 10 per cent. of the cost of the goods to the retailer, and for other cases where that sum may rise above 50 or even 100 per cent. of the cost, an addition of from 25 to 40 per cent. to the cost of goods to the retailer will, for the great bulk of trade, express the range within which the expenses and profits of retailers lie.



The total cost to consumers of the goods consumed in the United Kingdom in 1907 (including as "consumed" goods converted into fixed forms such as buildings or machinery, whether used in making good the effects of wear and tear or in enlarging the supply of buildings and machinery) thus appears to lie between £1,663,000,000 and £1,833,000,000.

These rough estimates must only be used with caution, but they are believed to lie within a range from which gross inaccuracy is excluded.

#### PRODUCTION, CONSUMPTION, AND INCOME OF THE UNITED KINGDOM.

In the preceding part of the Report, the value of the material goods consumed in 1907 in the United Kingdom, as delivered to consumers, has been estimated at somewhat over £1,700,000,000. As explained, the word "consumed" is here used in a somewhat broad sense, and includes, as consumed, those goods which are used in the maintenance and repair of machinery and plant, and those applied to extensions of such equipment, as well as the goods consumed, in the narrower sense, that is to say, used for the satisfaction of immediate needs on the part of the consumer. In so far as regards industry (as separate from agriculture and fishery) it has already been pointed out that the addition of values created in the year over the cost of materials used amounts to £747,000,000 (excluding duties).

In order that misunderstanding may not arise in regard to the significance of the figures, it is essential that attention should be directed to the fact that what has been classed as net output includes certain elements other than the new values added by the year's efforts to the materials employed.

Thus the value added to cotton or wool yarn by the weaving process represents in part a value of textile fabrics which replaces the wear and tear and the progress of obsolescence of the looms and driving machinery used in the process of weaving. The net output must therefore not be interpreted as representing a disposable income immediately divisible among the various interests concerned. Only after it has been charged with the cost of maintaining the plant, &c., used in its creation do we arrive at the truly disposable portion of the output, that is, the part from which current needs for consumption are met and additions to the capital of the community are provided.

The Returns made to the Census of Production Office do not contain the full information from which alone the proportion of the net output required for the upkeep of capital can be precisely determined. The matter is of fundamental importance for the interpretation of the results of the Census, and, as it appears possible to arrive at an estimate, within relatively moderate limits, of the magnitude of the sum involved, the following paragraphs are concerned with a brief discussion of this and of the closely associated question of the extent of the annual additions made to capital in the United Kingdom. It should be borne in mind, however, that a larger measure of estimate enters into the calculations which are made in the following paragraphs than was necessary in the preceding part of the Report, and that the Returns made to the Census Office have had to be supplemented by other information to a greater extent than in that part.

It is possible, by an examination of the Returns made to the Census of Production Office, to separate the various classes of output into such as are adapted for the personal use of consumers, and such as, by their nature, must be employed in making or repairing machinery, plant, or buildings. Making a corresponding analysis of the Trade Accounts, it is found that the value at works or port of landing of the goods made or imported for use in the United Kingdom in making or repairing plant and machinery, together with the value of buildings and other works of construction, maintenance, and repair carried out by private firms and companies, public utility companies, and Government departments and local authorities, was about £320,000,000 to £325,000,000, and additions for carriage, merchants' profits, &c., may have raised the total value of those products, as placed at the disposal of their users, to about £350,000,000 to £360,000,000. From this total, repairs, maintenance, and replacement of capital, both in industries covered by the Census of Production Returns and in other industries, including transport, must necessarily be met, the excess above what is required for these purposes being available for additions to capital, though not

necessarily to manufacturing capital. It is possible to identify a total of some 130 to 135 millions sterling returned as the cost of repair or maintenance work included in the above-mentioned sums. The work of construction, maintenance, and repair included in these figures as done by employees of Government departments and local authorities (excluding their gas, water, and electricity undertakings) amounts to about £32,000,000, of which about £20,000,000 were for repairs.

The total of 130 to 135 millions sterling does not cover the full amount assignable to wear and tear of industrial plant, &c., and in the absence of precise information as to the actual total it would appear that some guidance as to the approximate magnitude of the sum required might be obtained from a consideration of the value of the total capital employed. This total, though, like the wear and tear total, it is unknown, appears to be capable of estimation with moderate accuracy, and a discussion of the basis of such an estimate is given in a note to this Section (*see* pages 35 and 36), in which the total of the capital directly employed in the industries covered by the Census of Production is computed as lying between £1,400,000,000 and £1,600,000,000.

Basing a calculation on a figure of this approximate magnitude, it would appear that from the net output of the industries covered by the Census a sum lying between £75,000,000 and £85,000,000 must be assigned as a wear and tear allowance, absorbing from 10 to 12 per cent. of the net output of £747,000,000. Of this wear and tear allowance about £10,000,000 have already been taken into account as the cost of materials used in repairs executed by the employees of industrial firms on the firms' own buildings, plant, &c. A consideration of the corresponding requirements in respect of capital employed in agriculture and in transport and trade indicates that the maintenance of the capital of the United Kingdom in 1907 would require a sum roughly estimated as lying between £170,000,000 and £180,000,000.

Taking this estimate in connexion with the figures given on the preceding page for the consumption of goods which, by their nature, are used in replacements and extensions of capital, there remains a sum of from £170,000,000 to £190,000,000 available for new capital investments within the United Kingdom in 1907. To this sum additions must be made in respect of any increase of stocks of goods ready for consumption, whether in the hands of makers, dealers, or users, since it is not possible to distinguish from the Returns received whether the goods made are actually consumed or held ready for consumption. So far, however, as stocks held by makers and dealers are concerned, there is a growing tendency to reduce stocks and to depend in a larger degree than formerly on the elasticity of the productive processes in meeting sudden demands. Increase of stocks in the hands of users covers that form of saving which consists in providing larger supplies of clothes, furniture, &c., or in adding to the accumulation of such things as pictures, books, and the like. In reference to this latter point, examination of the Returns made to the Census Office shows that the value of goods for personal use, but of a durable character, such as furniture, musical instruments, carriages, motors, cycles, plate, jewellery, hardware, hollow-ware, china, earthenware, &c., made in, or imported into, the United Kingdom and retained, amounted to about £65,000,000. So much of this as was not required for replacements of similar goods worn out, or otherwise passed out of use, constitutes a form of saving. A supplement of some importance may, therefore, be necessary to the total assigned above for additions within the United Kingdom to material resources for production or for enjoyment.

It must, however, not be overlooked that the new investments do not constitute as a whole a net addition to capital values. Even in cases in which plant, machinery, buildings, &c., are maintained in good physical condition, their value may be reduced owing to the fact that changes in the requirements of the community are in progress, and that the methods of production are undergoing continuous modification, so that obsolescence destroys the value of capital even though its physical condition be maintained. The rate of growth of the value of the capital engaged in production, transport, and distribution may, therefore, be considerably less than that which would correspond to the extent of new investment estimated above.

There is, further, some apparently new investment which does not, in reality, correspond to extensions of the capital of the community. The annual sum assigned above for wear and tear and replacement of manufacturing and mining capital, viz., £75,000,000 or £85,000,000, is only in part dissipated in current repairs and renewals. The reserve funds of individual businesses, provided out of this total, are invested either outside of or in the businesses themselves, and are to a large extent designed to provide for the ultimate substitution of fresh forms of capital for the capital now existing rather than for the current maintenance of such capital.



The allocation of the new capital of the United Kingdom between different forms of investment cannot be made with any precision on the basis of existing information. The erection of houses on land on the borders of urban areas absorbs much new capital. The gross profits from the ownership of houses, as shown in the reports of the Inland Revenue Commissioners, were greater by £3,155,000 in 1907-8 than in 1906-7, and a further increase of £3,113,000 was shown for 1908-9. Capitalising the indicated increase in revenue at 15 years' purchase, there is an addition of about £47,000,000 to capital in the form of houses (including sites). Thus a large fraction of the total new investment would appear to take the form of house property. The issued capital of railways in the United Kingdom increased from £1,286,883,000 in 1906 to £1,294,066,000 in 1907, and £1,310,553,000 in 1908. The outstanding loans of local authorities amounted in 1906-7 to £573,212,000, in 1907-8 to £584,870,000, and in 1908-9 to £595,335,000.

Taking into account only the three classes of home investment particularised above, there was left in the censal year for additions to capital in mining and quarrying, in manufacturing industries, in agriculture, in wholesale and retail distribution, and in shipping something between £95,000,000 and £115,000,000.

Besides the additions to capital within the United Kingdom, there are additions to investments outside the United Kingdom to be brought into account. The amount of these was estimated by Sir George Paish\* at £89,322,000 in the twelve months ending 30th June, 1907, and at £110,144,000 in the succeeding twelve months, so that for the year 1907 a total of about £100,000,000 would appear to be a reasonable estimate. In part this addition is provided from the output of the United Kingdom in the year, in part from funds accruing abroad to the credit of United Kingdom owners and reinvested. It may be recalled in this connexion that Sir George Paish assigns no less a sum than £140,000,000 as the annual revenue from foreign investments owned in the United Kingdom, and that the earnings of shipping and mercantile and other services rendered abroad are believed to account for a further sum now little if at all short of £100,000,000† in excess of corresponding payments due from this country. It must be remembered, however, that these figures are of the nature of estimates, and no definite conclusion as to the proportion of the new investment abroad which was provided from the savings of home production can be drawn from them.

The preceding discussion of the results which follow from the necessity of qualifying the meaning to be attached to the word "consumption," as applied to the value resulting from the returns of production made and the estimated charges of handling the produced goods, yields the following general summary of the position:—

	Million £
Goods used for personal consumption ... ..	1,248 to 1,408
Goods applicable to capital purposes:—	
(1) Maintenance of existing capital ... ..	170 ,, 180
(2) Investments at home ... ..	170 ,, 190
Goods used to maintain or increase stocks of consumable goods, about ... ..	65
Goods exported, including such as afforded means of payment for new investment abroad... ..	464

The last item in this list is made up of two parts, the one constituting a means of payment for imported goods, which latter are already included, so far as they are consumed at home, either without further manufacture or after undergoing some process of adaptation, in the earlier items of the list. The other part constitutes the means of furnishing the funds for creating new capital, or acquiring ownership of additional amounts of existing capital, abroad. The total savings of the community are made up of the third item in the list, an unknown part of the fourth item, and about £100,000,000 for the estimated increase in foreign investments, in all an amount lying between £320,000,000 and £350,000,000, while the value of the material goods available for personal consumption in the year was, with rough approximation, about four times as great.

The consumption of these material goods, and the saving of the estimated additions to capital, are not done exclusively by the classes engaged in production, distribution, and transport. Other classes share in the consumption and in the saving, and these acquire the ownership of the material goods consumed or saved by the exchange of services of various kinds for such goods. It may be noted in passing that there is also an exchange of services of one kind for services of another kind, *e.g.*, medical services for legal services, as well as the exchange of services for commodities, all these exchanges being effected by

\* Journal of the Royal Statistical Society, September, 1909.

† *cf.* Cd. 1761 of 1903, pp. 99-104.

the sale of services for money, and the purchase of services or goods with the money thus provided. The total income of the country is made up of the value of the goods consumed or saved, and of the services not embodied in material goods which are rendered by some of its inhabitants to others for payment. The value of services (such as those of mothers to their families), which are not rendered in return for a stipulated money payment, cannot be estimated even roughly.

The classes of income to be included in the total of the remunerated services now to be brought into account include mainly the following:—

- i. The income arising from ownership of dwelling-houses, hotels, restaurants, lodging-houses, hospitals, schools, &c., which, on the basis of the figures for Inhabited House Duty for 1907, may be estimated at about £150,000,000. Income from ownership of lands, business premises, and royalties is already covered by the value of the goods produced.
- ii. Railway revenue from passenger service, which amounted in 1907 to £50,975,000, subject to deduction of the value of coal, &c., consumed and of expenses of business firms' travellers, the latter being defrayed out of the value of the goods handled.
- iii. Tramway and light railway receipts for passenger service, which, as shown in the Return on Tramways and Light Railways (H. of C. 268/1908), amounted to £12,440,000 in 1907-8. A deduction should be made from this sum in respect of coal and electricity used and returned to the Census Office as output.
- iv. Postal service, yielding in 1907-8 a gross revenue of £22,300,000, part of which, however, is already covered by the value of the goods in respect of which business correspondence was carried on or which were distributed by parcel post.
- v. The wages of about 2,400,000 persons engaged in the year of return in domestic, hotel, and restaurant service. The aggregate amount of money wages may be estimated at about £50,000,000 annually. To this should be added a sum of about 30 or 40 millions sterling, which may be regarded as the equivalent of the board provided for such servants by their employers in addition to their money wages.
- vi. Central and local government services, the receipts for which (exclusive of rents, post office, water, gas, electricity, tramways, loans, and sales of property) amounted in 1907-8 to about £216,000,000, about £81,000,000 of this total being loan charges and repayment of loans. Out of the remaining £135,000,000, however, £69,300,000 represents Customs and Excise duties and licences included in the value of goods, and £30,000,000 is covered by value of work included as output for Census of Production purposes.
- vii. The income of the professional and artistic classes, other than doctors, teachers, &c., in the employment of the State or of local authorities—that is, the clerical, medical, teaching, literary, scientific, artistic, musical, and dramatic professions; and the engineering, surveying, banking, insurance, and legal classes, except in so far as their services were rendered to manufacture or distribution and have already been taken into account.
- viii. The income of certain classes not coming within the purview of the Census of Production, and not included in agriculture, fishery, transport of goods, or distribution (*e.g.*, chimney-sweeps, hairdressers, cabdrivers, &c.).

There are no sufficient data on which the income of the professional classes and of certain classes omitted from the Census can be satisfactorily estimated, but, in order to gauge the significance of the results of the Census of Production, a figure which is a very rough approximation may be tentatively used, and for this purpose it is proposed to estimate the total value of goods and services consumed by the classes engaged in supplying the services enumerated above at a figure of about 350 to 400 million pounds sterling. In this figure the savings of these classes are not included, and there are no data justifying the allocation among the various groups contributing to it of the total savings of the country, already estimated as a whole at £320,000,000 to £350,000,000.

The total income of the United Kingdom in 1907 may now be roughly estimated as follows:—

	Million £
Goods consumed or exchanged for services by classes engaged in production and distribution... ..	1,248 to 1,408
Goods consumed or exchanged for services by classes engaged in supplying services ... ..	350 to 400
Additions by all classes to savings and investments	320 to 350
Total ... ..	1,918 to 2,158



Bearing in mind that there is some doubt as to the net output of the persons in respect of whom Returns were not furnished to the Census of Production Office (see page 10), the above range of income may be expressed as lying between 1,900 and 2,150 million pounds sterling.

It may be noted that the recent estimates of the amount of the aggregate of the incomes of the inhabitants of the United Kingdom have ranged about the round figure of £2,000,000,000, as Professor A. L. Bowley's latest published estimate is that "the total estimated value of services rendered to, or commodities consumed by, the members of the nation, together with the addition to savings"\* is about £1,800,000,000, while in the columns of the "Statist" an estimate for the present time of £2,250,000,000 has been given, a total which is understood to apply to the current year and to include an allowance for the unremunerated services of married women as housekeepers for their families; the latter figure is thus greater than the corresponding total for the year 1907 would be. The foregoing examination of a mode by which the problem may be approached from the side of the Census of Production Returns yields a total which may be put approximately at about £2,000,000,000 for 1907.

Census of Production Office,  
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A. W. FLUX.

NOTE ON CAPITAL EMPLOYED IN THE UNITED KINGDOM IN INDUSTRIES COVERED BY THE CENSUS OF PRODUCTION.

Although no Return has been obtained of the amount of capital employed in the various mines, quarries, factories, and workshops whose production was reported to the Census of Production Office, it appears to be possible to estimate within a moderate margin of error the aggregate value of such capital. For the purpose of determining the significance of the figures of output, and particularly of estimating roughly how much of that output is required for the current maintenance of capital against wear and tear and obsolescence, a precisely accurate figure of capital is not essential, although the estimates of depreciation might be improved considerably were accurate figures available regarding capital employed. The following statement shows how an approximate estimate of capital used in industries covered by the Census of Production may be arrived at.

(i.) So far as concerns mining and quarrying, an estimate may be based on the usual assumption of 10s. of capital per ton of coal and ironstone raised, and on information derived from the *Stock Exchange Year Book*. By this method a capital of about £153,000,000 is reached for mining and quarrying.

(ii.) Particulars as to the outstanding capital of gas, electricity supply, and water undertakings in the United Kingdom in 1907 are obtainable from the Local Taxation Returns for 1907-8, from the Return issued by the Board of Trade (H. of C. 180 of 1909), from Garcke's "*Manual of Electrical Undertakings*" for 1908, and from the *Municipal Year Book* for 1909.

From these sources the value of capital may be estimated as follows:—

	£
Gas Undertakings ... ..	118,283,000
Electricity Undertakings ... ..	74,516,000
Water Undertakings ... ..	157,384,000

or a total of £350,183,000.

(iii.) For other productive work than that covered in the preceding two paragraphs, the material for directly estimating the capital employed in such work in the United Kingdom is very incomplete. An indication of the approximate total of capital may be arrived at by an examination of the results of the enquiries conducted, in connexion with the Census of the United States, into the amount of capital employed in the industries of that country. The comparison of capital with output in the United States yields a figure which, applied to the output of the United Kingdom, will afford an approximation to the capital employed in this country in the industries concerned. In some cases, United States industries may be conducted on a smaller capital per unit of output, in others it is practically certain that the capital used there is greater for a given value of output than is needed here. On the whole, the resulting total may be taken as a rough estimate of the magnitude of industrial capital in the United Kingdom. The year 1907, to which the Census of the United Kingdom Production applies, being a year of exceptional activity, would be likely to show a higher ratio of net output to capital than ordinary years. Further, as is pointed out in the Reports on the 1905 Census\* in the United States, the activity displayed in the consolidation of certain plants under a single management, after 1899, was accompanied by considerable inflation of the capital returned. The results of the application to the figures of net output of United Kingdom manufacturing industry of the proportion of capital to net output shown in the United States Census Reports is to give an aggregate of about £900,000,000 if the figures of 1899 be taken, and about £1,100,000,000 if the figures of 1909 be taken, while an intermediate figure is afforded by the Returns of 1904.

Adding the £350,000,000 estimated as the capital of gas, electricity, and water undertakings, and the £153,000,000 estimated for mining and quarrying, we arrive at a total of from £1,400,000,000 to £1,600,000,000 as a rough estimate of the value of capital employed in industries covered by the Census of Production. In view of what has been said above as to the inflation of the United States figures in the later years, it seems probable that the higher figure may be taken as overstating the value of the United Kingdom industrial capital.

It may be observed that an estimate of the capital employed in the cotton industry, so far as concerns the spinning and weaving branches, may be based on the estimated capital per spindle and per loom, for which figures are given in a recent paper by Professor S. J. Chapman.† The capital as thus estimated amounts to about £95,000,000 for 1907, or  $2\frac{1}{2}$  times the net output shown in the Census of Production Returns. In the United States the ratio of capital to net output in the spinning and weaving of cotton was 2.8 to 1 in 1899,  $3\frac{1}{2}$  to 1 in 1904, and 3.2 in 1909.

Again, the result of a special investigation of a large group of firms engaged in the iron, steel, and engineering industries of the United Kingdom shows that the ratio of the face value of capital of all kinds outstanding in 1907 to the net output of those firms in that year was about as  $2\frac{1}{4}$  to 1. In the United States, for the whole group of trades manufacturing "iron and steel and their products," the ratio was as 1.9 to 1 in 1899, as 2.3 to 1 in 1904, and as 2.6 to 1 in 1909.

It may be observed that the ratio of capital to net output in the cotton and iron and steel trades in the United States was higher than for the aggregate of all industries.

These particular cases support the view that the industrial capital of the United Kingdom is not likely to be, on the whole, greatly different, in proportion to net output, from that of the United States.

In determining the amount probably necessary for the depreciation allowance on industrial capital, it may be remembered that it is commonly held by cautious manufacturers that provision should be made in business accounts for the renewal of buildings and plant in ten years.

The aggregate value of all industrial capital arrived at above, viz., £1,400,000,000 to £1,600,000,000, includes both the value of land, buildings and plant, and the value of the working capital used in the various enterprises. For the purpose of calculating the amount required for depreciation and renewals, these various divisions of the aggregate capital must be considered separately. It would appear that the value of buildings and plant may be estimated at nearly two-thirds of the total capital employed, that proportion representing a rough average of widely varying figures for different industries, the relative importance of the capital engaged in those industries being taken into account

\* "An Elementary Manual of Statistics" (Macdonald & Evans, London, 1910, page 171).

† Cf. *inter alia* Special Reports, Manufactures, Part I., p. lxx.  
† Cf. Journal of the Royal Statistical Society, February, 1912.



in arriving at the average. If that proportion be taken and an allowance made for the probability that the higher estimate of capital is too great, the provision for repairs and renewals would relate to a total of about £900,000,000 to £1,000,000,000. On a 4 per cent. basis, an annual charge of between £75,000,000 and £85,000,000 would be required for the renewal every ten years of capital of this total value. The consideration that part of the capital does not require renewal in so short a period as ten years may be set off, not only against the fact that more speedy renewal is required in other cases, but also against the fact that the provision which is the subject of the present estimate is required to cover current repairs as well as renewal of outworn plant.

Of this annual charge, only about £65,000,000 to £75,000,000 is required to be provided for out of the net output, since materials used in repair and construction work carried out by employees of the firms owning the plant and buildings are included in the aggregate of materials used to a value of about £10,000,000.

To estimate the sum needed for wear and tear and renewal of agricultural capital, note may be taken of the results of Mr. Robert J. Thompson's "Inquiry into the Rent of Agricultural Land in England and Wales during the Nineteenth Century,"\* in which the amount required to provide a sinking fund for permanent improvements is placed at a quarter of the rent; and of the estimate of farmers' capital contained in Mr. Primrose McConnell's "Agricultural Note Book," viz., £320,000,000, of which £194,000,000 is assigned to live-stock and £36,000,000 to implements, tenants' fixtures, &c. The annual charges for maintenance of agricultural capital would thus amount to between £12,000,000 and £13,000,000 for permanent improvements and about £3,500,000 for tenants' fixtures, implements, &c. The renewals of stock are provided for by natural increase and by the treatment of fodder crops as materials in the estimates of the value of agricultural output.

The total of £15,000,000 allowed for maintenance of capital in agriculture includes the value of tiles and other goods used in such work but not included in the total of £135,000,000 which represents the value of the repairs actually ascertained from the Census of Production Returns to have been executed in 1907.

The Report of the Commissioners of Inland Revenue for the year 1908-9 (Cd. 4868) shows that the sum of about £33,000,000 was allowed in respect of 1907-8 by way of deduction in respect of repairs to houses; a small portion of this sum is doubtless included in the amount allowed for industrial repairs, but on the other hand, repairs executed by house-owners whose incomes fell below the exemption limit were not included.

According to the Returns made to the Census of Production Office the cost of repairs of ships, &c. amounted to about £8,500,000 in 1907, and the cost of repairs and new construction of railways to £34,710,000. The Annual Railway Returns indicate that the expenditure of railway companies in 1907 on maintenance of way, works, &c., and on repairs and renewals of engines, carriages, and wagons was about £21,000,000. Repair and maintenance work carried out by local authorities and by tramway, canal, and harbour companies in 1907 amounted to about £17,500,000.

Consideration of these various elements of the total expended on repairs and maintenance, and of the items of this character not specifically discussed above, has led to the adoption of the estimate of £170,000,000 to £180,000,000 as the amount applicable to wear and tear and renewals out of the goods destined to capital uses included in the output of 1907.

Estimates of the total capital of the United Kingdom have been made in two different ways. The well-known figures of Sir Robert Giffen were based on Income-Tax Returns, the proportion of income under the various headings shown in the Income Tax Commissioners' Reports which may be regarded as due to capital, and therefore to serve as the basis of capitalisation, being matter of estimate in each case. Proceeding from statistics of successions, derived from returns of death duties, Mr. Bernard Mallet† has arrived at an aggregate figure by examining the average interval between such successions. The latter figure is substantially less than those based on the former method which have been computed by Mr. F. W. Hirst and by Mr. R. A. Macdonald‡, and this fact suggests that the proportion of revenue derived from capital, or the rate of capitalisation, or both, may have been taken at too high figures by Sir R. Giffen, or may have changed since his calculations were made. The aggregates arrived at by Mr. Hirst, who has modified several of the rates of capitalisation used by Sir R. Giffen, are, for 1905, £13,036 millions, and, for 1909, £13,986 millions, while those given by Mr. Macdonald, using Sir R. Giffen's rates of capitalisation, are, for 1900, about £13,500 millions, and for 1909, £15,800 millions. It may be noted, as affording some explanation of the discrepancy between the figures derived from Income-Tax Returns and those based on successions, that, in the former, in the Returns of public companies, the holdings of securities of other companies as investments leads to duplication of the total capital. On the other hand it has been suggested by various authorities that property passing at death may not be fully represented in the assessments for death duties.

The mode in which Sir R. Giffen's capital estimates were compiled admits of the separation of the capital engaged in manufacture and mining, transport, and distribution from the total. It would appear that the total under these heads was estimated as about one-third of the entire capital wealth of the country, or about £4,200,000,000 to £5,000,000,000 in 1907, according to the estimate adopted; in this railways are included for an amount of about £1,050,000,000.

If a figure of about £1,500,000,000 be taken as the approximate representation of manufacturing capital, there remains for capital used in distribution a sum of £1,600 millions by the one estimate or £2,400 millions by the other, amounts so large in proportion to that arrived at for manufacture that it may be suggested that the difference between the results of applying the methods of Sir Robert Giffen and that of Mr. Bernard Mallet may be in no small part due to the uncertainty necessarily attaching to the proportion in which the income under Schedule D is derived from capital, and the resulting possible overestimate of the corresponding capital involved in applying Sir Robert Giffen's mode of calculation.

\* Cf. Journal of the Royal Statistical Society, December, 1907.

† Cf. Journal of the Royal Statistical Society, March, 1908.

‡ Cf. The Progress of the Nation, by G. R. Porter. New edition, revised by F. W. Hirst, 1912, page 701. Journal of the Royal Statistical Society, 1912.