

Chapter I.—GENERAL EXPLANATIONS

This volume presents the statistics of the Eighth Biennial Census of Manufactures, which covered the industrial and publishing and printing activities of the calendar year 1935. The Census of Manufactures was taken decennially prior to 1899 and for each fifth year thereafter until 1919, and has since been taken at biennial intervals.

1. **Legal provision for biennial census.**—For the biennial censuses of manufactures, somewhat less detailed and comprehensive than the quinquennial censuses formerly taken, legal authority is found in section 32 of the Fourteenth Census Act and in section 17 of the Fifteenth Census Act.

2. **Area and period covered.**—The canvass covered the 48 States and the District of Columbia. The returns represent a year's operations, except for establishments that began or discontinued business within the year. In most cases they relate to the calendar year 1935, but in a few cases they cover fiscal years differing from the calendar year.

3. **The canvass.**—The questionnaires were mailed late in December 1935 and early in January 1936 to all manufacturers, printers, and publishers who had reported in the census for 1933, and to others whose names were obtained from various sources, such as trade directories. The respondents were requested to fill out the questionnaires and hold them until called for by field representatives of the Bureau. The collection was made by a force of canvassers employed primarily on the Census of Business, which was carried on as a Federal works project. These field representatives were required to make a door-to-door canvass in all cities, towns, and villages, and to obtain returns from all establishments (including those to which questionnaires had not been mailed) that had been engaged in manufacturing, printing, or publishing during any part of 1935, and whose production during the year had been valued at \$5,000 or more. (See "Establishments covered—Size," p. 5.) The usual cooperative arrangements were made with the Forest Service, of the Department of Agriculture, and the Department of Labor and Industries of Massachusetts.

4. **Revision of questionnaires.**—Because of the necessity of curtailing the work on the 1933 census, fewer "special" schedules or questionnaires (each of which calls specifically for data on the kinds or classes of products made in a single industry or in a few closely related industries) were used than in preceding censuses, the amount of detailed information called for on most questionnaires was reduced, and abridged schedules were used in canvassing the small establishments in most industries. In the 1935 census, however, the number of industries covered by special questionnaires was increased; the questionnaires were expanded so as to provide for obtaining about the same amount of production detail as in the 1929 and 1931 censuses, and more detail on consumption of materials than in the 1931 census;

and the use of the abridged questionnaire for the small establishments was discontinued. In all, 158 questionnaires were used in canvassing 291 industries, the remaining 49 industries being canvassed by the general schedule.

All practicable recommendations made by manufacturers and others were incorporated in the questionnaires, and they were harmonized, so far as practicable, with those used by the Bureau in making certain monthly and quarterly canvasses.

5. Publication of the statistics.—The more important statistics were first given out in mimeographed or multilithed press releases, issued as preliminary and subject to revision. Most of the final statistics were published in the form of printed pamphlets, but, because of the necessity of restricting the amount of census printing, some of them were issued only in multilithed form. All the reports that were issued in pamphlet form, together with some additional material, have been assembled in this volume.

Preliminary industry reports, subject to revision, each relating to a single industry, or, in a few cases, to a small group of closely allied industries, were issued in mimeographed form. The mimeographed reports covered 204 of the 340 industries recognized by the Manufactures Census classification. (See sec. 7, p. 6.) Except in a very few cases, no State or industrial-area (see sec. 25, p. 16) statistics were included in the preliminary industry reports; but the reports for 52 industries were followed at short intervals by supplemental reports giving summary statistics by States. In addition, special preliminary reports, 29 in number, gave production figures for selected commodities. After the publication of the preliminary industry statistics, the reports listed below were issued in multilithed form. With a very few exceptions, all figures in these reports were final.

Summary by Industries. (Includes summary by industry groups. Table giving summary by industries is similar to table 4, chapter II.)

Summary for Geographic Divisions and States. (Similar to table 3, chapter II.)

Wage Earners by Months. (Statistics by industries and by geographic divisions and States. Figures for most industries, by States, appear in chapter III; no geographic-division or State totals are given in this volume.)

Salaries and Salaries in Detail. (Statistics by industries and by geographic divisions and States. Figures for most industries appear in chapter III; no geographic-division or State figures are given in this volume.)

Size of Establishments by Number of Wage Earners. (Statistics by industries and by geographic divisions and States; not included in this volume.)

A series of State reports giving summary statistics by industries. (Not included in this volume.)

A series of State reports giving summary statistics by counties and for cities having 10,000 inhabitants or more. (Not included in this volume.)

A series of industrial-area reports (see sec. 25, p. 16) giving summary statistics by industries. (Not included in this volume.)

Reports for cities of New York, Philadelphia, and Chicago, each giving summary statistics by industries. (Not included in this volume.)

Summary totals for approximately 700 cities (not included in this volume) were sent to the respective chambers of commerce, by which they were given out for local publication.

The final series of industry reports, 53 in number, covering, in the aggregate, 328 industries, were issued in the form of printed octavo pamphlets, the contents of which appear in chapter III of this volume.

6. Scope of the census.—The census statistics are compiled primarily for the purpose of showing (1) the production of each important class or kind of manufactured commodities and the increase or decrease therein; (2) the absolute and the relative magnitude of the various manufacturing industries covered, and their growth or decline; (3) the monthly and long-time trends in industrial employment; and (4) the industrial importance of individual States and other areas.

a. General and detailed statistics.—The general statistical items in regard to which data were compiled in the biennial census for 1935 are as follows: Number of proprietors and firm members; number of salaried persons, classified as salaried officers of corporations, supervisory employees, technical employees, and clerical employees; number of wage earners, by months; amounts paid during year in salaries and wages to the respective classes of employees; cost of materials, supplies, and containers for products; cost of fuel; cost of purchased electric energy; value of products. In addition, as explained in section 15, data in regard to the quantities and values of individual kinds of products were collected from establishments in most industries, data on quantities and cost of principal materials consumed were collected for many of the more important industries, and data on numbers, sizes, and capacities of machines and other equipment in use were collected for a few industries.

b. Establishments covered—Definition.—As a rule, the term “establishment” signifies a single plant or factory.

In some cases, however, it refers to two or more plants operated under a common ownership and located in the same city, or in the same county but in different municipalities or unincorporated places having fewer than 10,000 inhabitants. On the other hand, separate reports are occasionally obtained for different lines of manufacturing carried on in the same plant, in which event a single plant is counted as two or more establishments. In every industry, however, the difference, if any, between the number of establishments and the actual number of plants or factories is negligible.

c. Establishments covered—Type.—The censuses are confined, in general, to manufacturing industries proper. Data are collected for a few industries, however, whose activities are not manufacturing in the sense in which the term is generally understood, the most important example being printing and publishing. The following classes of establishments are not covered by the Census of Manufactures:

(1) Establishments which were idle throughout the year or reported products valued at less than \$5,000. (See sec. d, below.)

(2) Establishments engaged principally in the performance of work for individual customers, such as custom tailor shops, dressmaking and millinery shops, and repair shops. (This does not apply to large establishments manufacturing to fill special orders.)

(3) Establishments in the building industries, other than those manufacturing building materials for the general trade.

(4) Establishments in the so-called neighborhood industries and hand trades, in which little or no power machinery is used, such as carpentry, blacksmithing, tinsmithing, etc.

(5) Cotton ginneries.

(6) Small grain mills (gristmills) engaged exclusively in custom grinding.

(7) Wholesale and retail stores which incidentally manufacture on a small scale, particularly where it is impossible to obtain separate data for the manufacturing and for the mercantile operations.

(8) Educational, eleemosynary, and penal institutions engaged in manufacturing. (Data for the production of binder twine in penal institutions and of brooms in institutions for the blind are, however, collected.)

Most of the establishments of classes 3 and 4 also fall into class 2, their work being done mainly to individual order.

d. Establishments covered—Size.—No data are collected from establishments with products valued at less than \$5,000. The exclusion of data for these small establishments reduces considerably the number to be canvassed, but does not materially impair the accuracy of the statistics except for the single item “Number of establishments.”

(In the census for 1919, when the minimum limit was \$500, 99.5 percent of the total wage earners and 99.7 percent of the total value of products were reported by establishments whose production was valued at \$5,000 or more.)

7. **Classification of industries.**—Although there are thousands of more or less distinct lines of manufacturing activity, manufacturing establishments have been classified for census purposes into 340 industries. (Because of changes resulting from the establishment of new industry classifications and the combination or abandonment of old ones, the number varies somewhat from census to census.)

The production of each specific class of finished commodities, however small, might be looked upon as a separate industry; and in some cases certain of the distinct processes in the manufacture of a single commodity might be treated as separate industries, as, indeed, is sometimes actually done in the census reports. Manifestly, however, there must be some grouping of commodities and processes, not only in order to bring the number of industries within reasonable compass, but also in order to avoid the extensive overlapping which would result from an attempt to distinguish so large a number of industries. Each establishment must, as a rule, be treated as a unit, and the data reported by it must be assigned in toto to some one industry. In many cases an establishment manufactures several related articles or commodities, or performs several related operations. It is desirable, therefore, that the classification be broad enough to cover all the activities—or, at least, the principal activities—of such establishments.

The effort has been made to distinguish, so far as practicable, each well-defined or well-recognized industry. The classification has been based on prevailing conditions as to the actual organization of industry and the distribution of the various branches of production among individual establishments. It has been necessary, however, in some cases to combine the data for two or more industries which are usually considered fairly distinct from one another, because of the considerable amount of overlapping among them. Such cases arise where, although the majority of the establishments concerned confine their business to one or another of the industries, a few important establishments combine the activities of two or more industries to such an extent as to render it impracticable to obtain separate data for the different lines of activity.

8. **Classification of establishments.**—Each establishment as a whole (a single plant being counted as two or more establishments in certain cases, as explained in sec. 6*b*) is assigned, on the basis of its product or group of products of chief value, to some one industry classification.

The "general statistics" (those for number of establishments, employees, salaries and wages, cost of materials, fuel, etc., value of products, and value added by manufacture) for any particular industry cover the total manufacturing activities of the establishments classified in that industry. Many of the establishments make secondary products which normally belong to other industries. For example: Some of the establishments classified in the "Cheese" industry manufacture butter as a secondary product, and both butter and cheese are made as secondary products by some of the plants classified in the "Condensed and evaporated milk" industry.

The treatment of each establishment as a unit and its assignment to some one industry according to its product of chief value sometimes results in overrating the importance of certain industries and underrating that of others. For example: The industry classified as "Wire drawn from purchased rods" embraces, as its title signifies, only those establishments which draw wire from rolled rods purchased from other establishments. Many rolling mills operate wire-drawing departments; and wire and wire products are also manufactured in considerable quantities by establishments classified under the designations "Nonferrous-metal alloys; nonferrous-metal products, except aluminum, not elsewhere classified" and "Electrical machinery, apparatus, and supplies." The total output of wire and wire products by the establishments in the "Wire drawn from purchased rods" industry in 1935 was valued at \$118,755,961, whereas the total value of wire and wire products manufactured by all establishments which drew wire in 1935 amounted to \$304,077,973. Thus the output of the "Wire" industry represented less than two-fifths of the value of wire and wire products manufactured in all wire-drawing establishments. On the other hand, it should be noted that the \$304,077,973 reported as the total for all establishments engaged in drawing wire does not represent the value of wire alone but includes a considerable value of manufactures of wire, such as wire fencing, wire nails and spikes, and wire rope and strand—products similar to those manufactured from purchased wire by establishments under other classifications.

9. **Classification by industry groups.**—To facilitate the comparison of one broad class of manufacturing industries with another, the industries as constituted for census purposes are distributed into 16 general groups, for which summary statistics are given in the table on page 22.

This grouping is based in most cases on the character of the principal materials used, but several of the groups are constituted on the basis of the purpose or use of the chief products, and two, "Printing, publishing, and allied industries" and "Chemicals and allied products," on the character of the processes employed. It is of course necessary in some cases to include in a particular group certain industries that use considerable quantities of materials or manufacture considerable quantities of products other than those treated as basic for the group. For example: The "Furniture, including store and office fixtures" industry, included in the "Forest products" group, embraces the manufacture of metal as well as of wood furniture.

10. **Salaried personnel and salaries.**—Salaried employees and salaries have been reported in all quinquennial and biennial censuses of manufactures with the single exception of that for 1931. The figures for salaried personnel in this report do not include data for persons employed in central administrative offices. For the first time, separate data on the number and the compensation of technical employees have been collected. (At prior censuses such employees had been reported in some cases as administrative and in others as clerical.) Because of the practical impossibility of defining clearly the meaning of the word "technical" in its application to the reporting of employment data, and because some employees with technical training may function chiefly in an administrative capacity, it is by no means certain that technical employees were correctly reported in all cases, and therefore the figures for this class of the personnel, as given in a footnote to table 1 of the report for each industry (ch. III), must be accepted as only approximately correct.

11. **Wage earners and wages.**—Wage earners are defined as all time and piece workers employed in the plant (including the power plant and maintenance, shipping, warehousing, and other departments). Working foremen and "gang and straw bosses" are treated as wage earners, but foremen whose duties are primarily supervisory are classed as supervisory employees.

The questionnaires called for the number of wage earners on the pay rolls for the week that ended nearest the 15th day of each month, if that was a normal week, or for some normal week in the month. The average number of wage earners for 1935 as given in the tables presenting wage-earner statistics by months in the reports for the respective industries, appearing in chapter III (table 3 for most industries) is based on the figures for the twelve months of the calendar year, whereas the corresponding averages in tables 1 and 2 are based to some extent on data from returns covering business or fiscal years differing from the calendar year. (In the census for 1935, for the first time, wage-earner employment was reported for the calendar year in all cases, and for fiscal years also in cases in which production was reported for fiscal years.) The 1933 average was calculated by dividing the sums of the numbers reported for the several months on the standard questionnaire by twelve and on the abridged questionnaire by four (see sec. 4), and combining the two quotients.

The wage-earner averages given as United States totals in tables 3 and 4, chapter II, and in tables 1, 2, and 3 of each of the industry reports in chapter III are not necessarily identical with the sums of the averages for the several industries and the several States, as given in the respective tables, because each average (being a quotient, usually ending in a fraction, obtained by dividing the total of the corresponding monthly figures by 12) is correct only to the nearest unit.

The average for the year exceeds somewhat the number that would have been required for the work performed if all had been continuously employed through-

out the year, because of the fact that it is impracticable to take into account the extent to which some or all of the wage earners may have been on part time or for some other reason may not actually have worked on a full-time basis during the entire week covered by the entry for a given month. Moreover, in cases in which a plant was in operation during only a part of a month, the number of wage earners reported for the week selected would almost certainly be above the average for the month. The quotient obtained by dividing the amount of wages (the total amount paid to wage earners during the year) by the average number of wage earners cannot, therefore, be accepted as representing the average wage received by full-time wage earners. In making comparisons between the figures for 1935 and those for earlier years, the likelihood that the proportion of part-time employment varied from year to year should be taken into account.

12. Cost of materials, etc.—The 1935 questionnaire called for data on cost of (a) materials, mill and shop supplies (lubricating oil, minor replacements, etc.), and containers for products, (b) fuel, and (c) purchased electric energy. The schedules used in the 1933 and 1931 censuses called for combined data on cost of materials, containers for products, fuel, and purchased electric energy and did not provide for including cost of mill and shop supplies in this item. The schedule for 1929 called for data on cost of (a) materials and containers for products, (b) fuel, and (c) purchased electric energy, and did not provide for reporting cost of mill and shop supplies. The schedules for 1927 and prior census years directed the manufacturers to include data on cost of mill and shop supplies with those for materials, etc. As a result of these changes, the increase in the cost of materials, etc., for the period 1933–1935, as given in table 2, p. 18, is slightly overstated and that for the period 1927–1929 is slightly understated.

The cost of fuel covers coal, fuel oil, gasoline, etc., used for power purposes, for heating buildings, and for smelting and other forms of industrial heating, but does not cover the cost of coal and oil used as materials in the manufacture of gas and coke.

13. Cost of contract work.—The term “contract work”—which does not necessarily imply the existence of a formal contract—is applied both to work done outside the establishment reporting on materials owned by it and to work done in the establishment on materials not owned by it.

Payments made and amounts received for such work are shown separately only in the reports for those few industries—such as the Clothing, Leather Glove, and Printing and Publishing industries—in which it is important. In the great majority of manufacturing industries the contract work is small in amount, and in many cases it is merely incidental; that is, it is not a normal nor a necessary part of the industry's activity.

14. Value of products.—For years other than 1929, the amounts under this heading are the selling values, *at the factory or plant*, of all commodities produced (or, for some industries, receipts for work done) during the census year, whether sold, transferred to other plants, or in stock, and consequently, under normal conditions, the total value of products covers the cost of production (including overhead expenses) and profits. It also covers selling expenses except in cases where separate sales departments are operated, in which cases the values at which the products are turned over to the sales departments are reported. For 1929 the value of products was, for the majority of the industries, the selling value, *f. o. b. factory*, of products *shipped or delivered* during the year, but for 76 industries, including some of the most important ones, it represented products manufactured, whether sold or not.

The value of products is not a satisfactory measure of the importance of a given industry, because only a part of this value is actually created within the industry. Another part, and often a much larger one, is contributed by the value of the materials used. The aggregates for cost of materials and value of products include large amounts of duplication due to the use of the products of some industries as materials by others. (See secs. 16 and 18.) Furthermore, in the cases of several industries the value of products includes considerable amounts representing receipts for contract work. (See sec. 13.)

Some manufacturers sell their products at prices that include freight and other delivery charges, but these transportation charges are deducted wherever possible.

Railroad repair shops manufacture few if any products for sale, their work being done or their products manufactured solely or principally for the use and benefit of the railroads operating them. Since no market value is assigned to the work or the products of railroad repair shops, the value reported by them usually represents the operating cost or the cost of production.

Somewhat akin to the case of the railroad repair shops is that of establishments which make partly finished products, or containers and auxiliary articles, for the use of other manufacturing establishments under the same ownership. For example: A blast furnace produces pig iron for use in the production of steel in plants under the same ownership. In such cases the "transfer value" assigned by the manufacturer is accepted as the value of the product in question. This transfer value is usually based on market prices or on the cost of manufacture, but sometimes it is purely arbitrary.

Primary and secondary products.—The products made by the establishments in a given industry, on the one hand, usually include minor products different from those covered by the industry designation, and, on the other hand, may not include the entire output of products normally belonging to the industry, because some of this class of commodities may be made as secondary products by establishments classified in other industries. In the case of each industry, the value of the minor or secondary products normally belonging to it is offset to a greater or a less extent by that of commodities normally belonging to it but made as secondary products by establishments engaged primarily in other lines of manufacture. In most cases, therefore, the total value of the products of an industry, as reported, does not differ greatly from the value of the total output, in all industries, of the classes of products covered by the industry designation. (See "Classification of establishments," p. 6.)

In most of the product tables in this volume (table 4 in the reports for most industries) a separate item entitled "Other products (not normally belonging to the industry)" represents the production of commodities which normally are primary products of other industries. It has been necessary in some cases to distinguish between these secondary products normally belonging to other industries and minor or miscellaneous products of the industry covered by the report.

15. Detailed statistics for products, materials, and equipment.—For most industries data as to the quantities and values—or where quantity figures would have no particular significance, for the values only—of the separate classes of products are collected and compiled. For some, but not all, of these industries the quantities and cost of principal materials used are reported; and for a few industries detailed data on equipment in use were also collected.

While it is generally impracticable for a manufacturer to assign the proper proportions of the wage earners, wages, etc., to the various lines of manufacturing industry carried on in his establishment, most manufacturers are able to distinguish, exactly or approximately, the quantities and values of the several classes of products made. Special schedules calling for detailed information in regard to products were therefore sent to the establishments in 291 industries, and in some cases two or more special schedules were filled out for a single establishment whose manufacturing activities were of a varied character. The "General" schedule, which was sent to the manufacturers in the remaining 49 industries, also provided spaces for listing the quantities and values of the leading products separately, but in many cases only the total values of products were reported.

The tables giving detailed statistics on the products of a given industry include data for the production of similar commodities normally belonging to that industry but made as secondary products by establishments classified in other industries. In a few cases this secondary production is shown in footnotes. (See sec. 14, "Value of products—Primary and secondary products.")

Detailed data as to materials used are collected from establishments in many industries, including Bread and other bakery products, Flour and other grain-mill products, Gas, Confectionery, the Rubber industries, and the Textile industries; and special statistics on equipment are compiled for a number of industries, including the Textile industries, Blast-furnace products, Steel-works and rolling-mill products, and Wire drawn from purchased rods.

16. Duplication in cost of materials and value of products.—In making use of the statistics for cost of materials and value of products for groups of industries or for all industries taken as an aggregate, it must be remembered that they include a large amount of duplication due to the use of the products of some establishments as materials by others. The net value of all manufactured products is estimated to have been approximately two-thirds of the gross value for 1929. (See table 7, p. 36, Vol. II of reports for that year.) No corresponding estimate has been made for subsequent years.

This duplication occurs, as a rule, between different industries and is not found to any great extent in individual industries. To illustrate: Manufacturers classified in the "Rubber tires and inner tubes" industry sell a part of their output to manufacturers in the "Motor-vehicles" industry for installation on new cars and trucks. Thus the value of these tires is included in the total values of products of two industries.

The occasional occurrence of duplication between different establishments in the same industry is exemplified in the case of "Meat packing," where certain packing establishments purchase fresh meat from slaughterhouses for use as their material. The total value of products reported for the industry, therefore, includes the factory value of products which pass through further manufacturing processes in other establishments.

17. Relation of wages to cost of materials and value of products.—In making comparisons between the wages paid in manufacturing industries and the cost of materials and value of products of these industries, it should be borne in mind that whereas the material and product totals for industry groups or for all industries taken as an aggregate contain large amounts of duplication (see sec. 16), the wage figures are free from duplication.

Moreover, the cost of materials, excluding the duplication therein, is made up in considerable part of wages paid to wage earners in nonmanufacturing industries, such as agriculture, mining, fisheries, and transportation. For example: The iron ore used as a material in blast furnaces comes from iron mines and is transported to the furnaces by rail or by water. The cost of the ore at the mines consists in part of the miners' wages, and the cost of the ore delivered at the furnace includes also the wages paid to the employees of the navigation or railroad company which transported it. The pig iron produced by the blast furnaces is used as a material by steel mills. Thus the cost of this material is made up in part of the miners' wages, in part of the wages paid to the transportation employees, in part of the wages of the blast-furnace employees, and in part of other items. The wages paid the blast-furnace employees are included in the total wages shown by the manufactures' reports, but the miners' wages and the wages of the transportation employees are not included. Moreover, the cost of the pig iron used as a material by the steel mills includes that of the iron ore, fuel, and supplies used by the blast furnaces. If the steel mill and the blast furnace were treated as a single establishment, this duplication would be eliminated and the cost of materials would be that of the iron ore, etc., used by the blast furnace, and the corresponding duplication in value of products would also disappear. If the mine, the transportation company, the blast furnace, and the steel mill were operated under a single ownership and treated as a single establishment, the cost of materials would be reduced to the value of the ore in the ground and the cost of fuel and supplies; the value of products would be a net amount representing the output of the steel mill alone instead of being made up of the value of the steel-mill products plus the value of the blast-furnace products; and the wage item would cover all wages instead of being limited to the wages paid in the blast furnace and the steel mill.

Thus, if the aggregate amount of wages paid both in manufacturing industries and in those industries which supply the raw materials used by manufacturers were compared with the net cost of materials, fuel, etc., or with the net value of manufactured products in the form in which they reach the ultimate consumer, the ratio of the first amount to the second or to the third would be much larger than the ratio of the wages paid in manufacturing industries alone to the gross cost of materials or to the gross value of manufactured products.

18. Value added by manufacture.—For some purposes, the most satisfactory measure of the importance of an industry is the "value added by manufacture"—that is, the increment created by the manufacturing processes. This measures the net addition to the value of commodities in existence—i. e., raw materials, semimanufactured materials, and fuel—and is almost entirely free from the duplication that is a factor in the total value of products. (See sec. 16.)

It is calculated, for most industries, by subtracting the cost of materials, supplies, containers, fuel, and purchased electric energy used from the value of products. (The cost of purchased energy is included in the amount deducted, because it has not been reported separately in most censuses.) The cost of contract work (which represents a part of the cost of materials delivered at the respective factories) is also included in the amount subtracted in the cases of those industries in which this cost item is equal to 10 percent or more of the combined cost of materials, fuel, etc. (The value added in the shops in which the contract work is done is accounted for, being calculated by subtracting the small sums expended for materials, supplies, etc., by such shops from their receipts for work done.) For the sake of consistency, the cost of contract work has been thus taken into account in calculating the value added by manufacture for all industries in each "related-industry group" in Group 2 (see "Changes in Classification," p. 227) that includes any industry or industries in which the cost of contract work is equal to 10 percent or more of the cost of materials, fuel, etc. The value added by manufacture has been calculated by this special method for a considerable number of industries in Group 2 and for four industries in Group 5. The method employed is explained by a footnote or footnotes on table 1 of the report for each industry.

The amounts paid as processing taxes on the materials consumed and the amounts of internal-revenue taxes paid on the products made in certain industries are, in most cases, included in the values of products as reported to the Bureau of the Census, and therefore these have been added to the cost of materials in order to permit the calculation of the true value added by manufacture.

Because of the exclusion of data for cost of mill and shop supplies from the cost-of-materials figures for 1929, 1931, and 1933 (see sec. 12), the increase in value added by manufacture for the period 1933–1935, as given in table 2, p. 18, is slightly understated, and that for the period 1927–1929 is slightly overstated.

In comparing manufacturing industries with one another the relation between the value of finished products and the cost of materials should be kept constantly in mind. The products of one industry may be valued at the same amount as those of another, but the one may have added several times as much value to the materials as the other, and may therefore have been of correspondingly greater economic importance.

19. Production as measured by physical volume.—Because of price changes, the cost of materials, values of products, and values added by manufacture for different census years are not properly comparable. Statistics of the actual physical quantities of products manufactured provide the most trustworthy measure of the growth or decline of manufactures, but they are not available for all industries.

The number of wage earners employed is also a fairly satisfactory standard, but it must be remembered that, on the one hand, in some industries mechanical processes have displaced hand labor to such an extent as to make possible a marked increase in production with no increase in the number of wage earners, while, on the other hand, the average number of hours of labor per week has been decreasing for many years.

A study of the physical volume of output as disclosed by census figures was made for the Bureau of the Census by Edmund E. Day and Woodlief Thomas, and the results were published in 1928 under the title "The Growth of Manufactures," as one of a series of Census monographs.

The index numbers of physical output given in table 1, page 17, for 1899 to 1925, inclusive, are the Day-Thomas figures for those years. The indexes for subsequent years have been computed by the same method—those for 1927, 1929, and 1931 by Miss Aryness Joy, of the Federal Reserve Board, and those for 1933 and 1935 by Mr. V. S. Kolesnikoff, of the Central Statistical Board.

The figures in the second column of table 1, representing the total volume of wage-earner employment in 1899 and each subsequent census year, are a series of relatives computed by dividing the number of wage earners (average for the year) employed in manufacturing establishments in 1899 into the average number for each census year and multiplying the quotient by 100. "Production per wage earner" (fourth column), determined by dividing the index of physical output for each census year by the wage-earner index in the second column, indicates the general trend in output per wage earner.

20. Profits and production costs.—As the census statistics do not show total production costs, they cannot be used as a basis for the calculation of profits.

Costs for which data have not been collected comprise depreciation, interest, insurance, rent, taxes (except internal-revenue and processing taxes for certain industries), and other miscellaneous items.

The deduction of the sum of salaries, wages, and cost of materials, containers, fuel, and purchased electric energy from the value of products leaves a miscellaneous item (equal to the remainder obtained by subtracting the salary and wage items from "value added by manufacture") representing all other manufacturing expenses plus manufacturing profits (or minus manufacturing losses), but no basis exists in census data for distributing this amount among the constituent items of expense and profits. In fact, the books of a manufacturer who actually operated at a loss might nevertheless show a considerable excess of value of products over the sum of the expense items reported to the Census Bureau.

21. Statistics for earlier census years.—For the purpose of general comparison of industrial activity in different census years, a summary covering the period from 1849 to 1935 is given in table 2, Chapter II; and comparable figures for the last 4 census years are given in table 1 of the reports for most industries, in Chapter III.

Although the manufacturing industries of the country were canvassed in the censuses taken in 1810, 1820, and 1840, the results were not comparable with those of the manufactures inquiries made in 1850 (covering, in the main, industrial activities in 1849) and subsequent census years. The manufactures data collected in the decennial censuses taken during the period from 1850 to 1900, inclusive, covered the so-called "hand and neighborhood" industries in addition to the factory industries. (See sec. 6c.)

22. Adjustments in figures for earlier years.—It is sometimes necessary, for various reasons but chiefly because of changes in census classifications, to make adjustments in the figures for earlier census years. When such adjustments are of considerable magnitude, they are explained in headnotes or in footnotes; and when they are insignificant, and do not affect the comparableness of the statistics, the change is indicated by the footnote "Revised."

23. Disclosure of data for individual establishments.—The Bureau of the Census is prohibited by law from publishing any statistics that might disclose data relating to individual establishments.

For this reason it is necessary to omit all the State figures for a few industries and to include, in the "Other States" items in practically all the industry reports and in the "Other industries" items in all the State and industrial-area reports (multilithed), the data for certain States and for certain industries, respectively, that are more important than some of those for which separate figures are presented.

In general, separate figures are published in cases where a given industry in a given State or area is represented by three or more establishments. It sometimes happens, however, that one or two establishments produce a very large proportion of the combined output of three or more establishments in a particular

State or area, and in such cases separate figures are not given. To illustrate: Suppose that the combined production of two manufacturers amounted to 90 percent of the total for a group of five. Under such conditions either of the two manufacturers in question, knowing that he had only one important competitor in his State or industrial area, could subtract the value of his products from the combined value for the group of five and thus obtain an amount which would not greatly exceed the value of the products of his principal competitor. In cases like this the figures for the group in question are included in the "Other States" items in the industry table or in the "Other industries" items in the State or industrial-area table. In the table giving wage-earner statistics by months (table 3 in the reports for most industries, Chapter III), however, separate figures are given for every State in which as many as three establishments (under separate ownership) were located.

24. Changes in industry groups, classifications, and titles.—The following changes in classification and industry titles were made at the Census for 1935:

GROUP 1.—FOOD AND KINDRED PRODUCTS

Canned and cured fish, crabs, shrimps, oysters, and clams.—Formerly "Canned and preserved fish, crabs, shrimps, oysters, and clams."

Canned and dried fruits and vegetables; canned and bottled juices; preserves, jellies, fruit butters, pickles, and sauces.—Formerly "Canned and dried fruits and vegetables; preserves, jellies, fruit butters, pickles, and sauces."

Flavoring extracts, flavoring sirups, and related products.—Formerly "Flavoring extracts and flavoring sirups."

Liquors, distilled.—Formerly "Liquors, distilled, and ethyl alcohol." Production of ethyl alcohol, formerly included in this industry, now classified in "Chemicals not elsewhere classified," Group 6. A few rectifiers and blenders were also canvassed and assigned to this industry in former censuses.

Liquors, rectified and blended.—New classification. With very few exceptions, liquor rectifiers were not canvassed in prior censuses.

Poultry dressing and packing, wholesale.—Formerly "Poultry killing, dressing, and packing, wholesale."

GROUP 2.—TEXTILES AND THEIR PRODUCTS

The census classification for this group, which formerly embraced 52 industries, was revised and rearranged to comprise 22 "related-industry groups" which in turn comprise 82 industries. The reclassification included the following inter-group transfers of industries:

Straw hats, men's.—Transferred from Group 16 to Group 2.

Wool pulling.—Transferred from Group 2 to Group 16.

GROUP 3.—FOREST PRODUCTS

Boxes, cigar, wooden and part wooden.—Formerly "Boxes, cigar, wooden."

Synthetic-resin, cellulose-plastic, vulcanized-fiber, and molded and pressed pulp fabricated articles, not elsewhere classified.—Formerly "Pulp goods and molded composition products."

GROUP 4.—PAPER AND ALLIED PRODUCTS

No change.

GROUP 5.—PRINTING, PUBLISHING, AND ALLIED INDUSTRIES

Engravers' materials.—Abandoned as a separate classification; combined with "Printers' machinery and equipment," in Group 13.

Printers' supplies.—Abandoned as a separate classification; combined with "Printers' machinery and equipment," in Group 13.

GROUP 6.—CHEMICALS AND ALLIED PRODUCTS

Ammunition and related products.—Manufacture of railroad fuses and torpedoes, safety fuses, and miners' squibs, formerly included in this industry, now classified in "Fireworks and allied products."

— **Drugs and medicines.**—New classification. Comprises parts of former “Druggists’ preparations” and “Patent or proprietary medicines and compounds” industries.

— **Druggists’ preparations.**—Abandoned as a separate classification; part now included in “Drugs and medicines” and part in “Insecticides and fungicides, and industrial and household chemical compounds not elsewhere classified.”

— **Fireworks and allied products.**—Formerly “Fireworks.” Includes manufacture of railroad fuses and torpedoes, safety fuses, and miners’ squibs, formerly classified in “Ammunition and related products.”

— **Insecticides and fungicides, and industrial and household chemical compounds not elsewhere classified.**—New classification; comprises parts of former “Patent or proprietary medicines and compounds” and “Druggists’ preparations” industries.

— **Patent or proprietary medicines and compounds.**—Abandoned as a separate classification; part transferred to “Drugs and medicines” and part to “Insecticides and fungicides, and industrial and household chemical compounds not elsewhere classified.”

GROUP 7.—PRODUCTS OF PETROLEUM AND COAL

— **Lubricating greases, not made in petroleum refineries.**—Formerly “Lubricating oils and greases, not made in petroleum refineries.”

GROUP 8.—RUBBER PRODUCTS

No change.

GROUP 9.—LEATHER AND ITS MANUFACTURES

— **Boot and shoe cut stock and findings.**—New classification; comprises former “Boot and shoe cut stock, not made in boot and shoe factories” and “Boot and shoe findings, not made in boot and shoe factories” industries.

GROUP 10.—STONE, CLAY, AND GLASS PRODUCTS

— **Gypsum products.**—New classification; formerly included in “Wallboard, insulating board, gypsum and other plasters, and floor composition.”

— **Marble, granite, slate, and other stone, cut and shaped.**—Formerly “Marble, granite, slate, and other stone products.”

— **Wallboard and plaster (except gypsum), building insulation, and floor composition.**—New classification. Includes part of former “Wallboard, insulating board, gypsum and other plasters, and floor composition” industry, together with manufacture of mineral wool, formerly classified in “Steam and other packing, pipe and boiler covering, and gaskets, not elsewhere classified” industry.

— **Wallboard, insulating board, gypsum and other plasters, and floor composition.**—Abandoned as a separate classification. (See “Gypsum products” and “Wallboard and plaster (except gypsum), building insulation, and floor composition,” above.)

GROUP 11.—IRON AND STEEL AND THEIR PRODUCTS, NOT INCLUDING MACHINERY

— **Stamped and pressed metal products; enameling, japanning, and lacquering.**—Transferred from Group 12.

GROUP 12.—NONFERROUS METALS AND THEIR PRODUCTS

— **Stamped and pressed metal products; enameling, japanning, and lacquering.**—Transferred to Group 11.

GROUP 13.—MACHINERY, NOT INCLUDING TRANSPORTATION EQUIPMENT

— **Agricultural implements (including tractors).**—Formerly “Agricultural implements.” Includes manufacture of tractors, formerly classified in “Engines, turbines, tractors, water wheels, and windmills.”

— **Boiler shops.**—New classification; formerly included in “Foundry and machine-shop products not elsewhere classified.”

— **Cash registers, adding and calculating machines, and other business machines except typewriters.**—Formerly “Cash registers and adding, calculating, and

card-tabulating machines." Includes manufacture of duplicating, manifold, and check-writing machines, formerly classified in "Foundry and machine-shop products not elsewhere classified."

Cranes, and dredging, excavating, and road-building machinery.—New classification; formerly included in "Foundry and machine-shop products not elsewhere classified."

Elevators and elevator equipment.—Abandoned as a separate classification; included in new classification, "Machinery not elsewhere classified."

Engines, turbines, water wheels, and windmills.—Formerly "Engines, turbines, tractors, water wheels, and windmills." (See "Agricultural implements," above.)

Foundries.—New classification; formerly included in "Foundry and machine-shop products not elsewhere classified."

Foundry and machine-shop products not elsewhere classified.—Abandoned as a single classification; divided into six classifications, namely, "Boiler shops," "Cranes, and dredging, excavating, and road-building machinery," "Foundries," "Machine shops," "Printers' machinery and equipment," and "Machinery not elsewhere classified."

Machinery not elsewhere classified.—New classification; includes—

Part of former "Foundry and machine-shop products not elsewhere classified" industry.

Former "Elevators and elevator equipment" industry.

Manufacture of gas generators, formerly classified in "Meters (gas, water, etc.) and gas generators" industry.

Machine shops.—New classification; formerly included in "Foundry and machine-shop products not elsewhere classified."

Meters (gas, water, etc.) and gas generators.—Abandoned as a separate classification. Manufacture of gas generators now assigned to "Machinery not elsewhere classified," and manufacture of gas meters and of meters for measuring flow of water and other liquids now classified in "Instruments and apparatus, professional, scientific, commercial, and industrial," Group 16.

Printers' machinery and equipment.—New classification; includes—

Part of former "Foundry and machine-shop products not elsewhere classified" industry.

Former "Engravers' materials" industry, in Group 5.

Former "Printers' supplies" industry, in Group 5.

GROUP 14.—TRANSPORTATION EQUIPMENT, AIR, LAND, AND WATER

No change.

GROUP 15.—RAILROAD REPAIR SHOPS

Railroad repair shops, steam.—Now restricted to "classified shops"—those engaged in making general and heavy or "classified" repairs; formerly covered both classified shops and small shops engaged solely in making light and running repairs.

GROUP 16.—MISCELLANEOUS INDUSTRIES

Artists' materials.—Manufacture of crayons, formerly included in this industry, transferred to "Pencils, lead (including mechanical), and crayons."

Beauty-shop equipment, except furniture.—New classification. Most of the establishments in this industry were formerly classified either in "Electrical machinery, apparatus, and supplies," Group 13, or in "Miscellaneous articles not elsewhere classified," Group 16.

Combs and hairpins, not made of metal or of rubber.—Formerly "Combs and hairpins, not made from metal or rubber."

Dentists' equipment and supplies.—Formerly "Dentists' supplies and equipment, except instruments."

Hats, straw, men's.—Transferred from Group 16 to Group 2.

Instruments and apparatus, professional, scientific, commercial, and industrial.—Formerly "Instruments, professional and scientific, and gauges, except machinists' gauges." Includes manufacture of gas meters and of meters for measuring flow of water and other liquids, formerly classified in "Meters (gas, water, etc.) and gas generators," Group 13.

Pencils, lead (including mechanical), and crayons.—Formerly "Pencils, lead (including mechanical)." (See "Artists' materials," above.)

Steam and other packing, pipe and boiler covering, and gaskets, not elsewhere classified.—Manufacture of mineral wool, formerly included in this industry.

now classified in "Wallboard and plaster (except gypsum), building insulation, and floor composition," Group 10.

Window shades (textile and paper) and fixtures.—Formerly "Window shades and fixtures

Wool pulling.—Transferred from Group 2 to Group 16.

Tobacco (chewing and smoking) and snuff.—Formerly "Tobacco: Chewing and smoking, and snuff."

25. Industrial areas.—Because of the fact that the area of which an important city is the business and industrial center usually extends some distance beyond the municipal boundaries, manufactures statistics for the city alone do not present a true picture of its industrial importance. For this reason 33 "industrial areas" have been established for census purposes. Each of these includes an important manufacturing city, or two or more such cities, and comprises the entire county or counties in which the city or cities are located, together with any adjoining county or counties in which there is considerable concentration of manufacturing industry. The manufacturing and printing and publishing industries in each of these industrial areas employed more than 40,000 wage earners in 1929 and more than 30,000 in 1935, and the industries in the 33 areas taken together accounted for 55.4 percent of all wage earners employed in manufacturing and printing and publishing industries in the United States in 1935.

Statistics by industries have been published in a series of multilithed reports for 32 of the industrial areas. In the case of one of them—the Dayton area, consisting of Montgomery County, Ohio—however, it is impossible to publish figures for the most important industry without disclosing approximations of data pertaining to a single company; and those industries for which it would be possible to publish separate figures without disclosing exact or approximate data for individual establishments accounted for less than 50 percent of the total number of wage earners employed in all industries in the area. No report for this area has, therefore, been issued.

The industrial area must not be confused with the "metropolitan district," as established for population-census purposes, which includes, together with the central city or cities, all the adjacent civil divisions having at least 150 inhabitants per square mile. Each industrial area comprises one or more entire counties, whereas all metropolitan districts include parts of counties.

26. Other industrial census statistics.—In addition to the census of manufactures, the Bureau makes special inquiries in regard to production, sales, shipments, stocks, consumption, new orders, etc., of a large number of commodities or classes of commodities.

The reports on these inquiries are issued at intervals ranging from a month to a year, each presenting statistics on some one class of commodities or on some specific industrial trend, service, or condition. They cover such subjects as production of shoes and other footwear, gloves, men's clothing, cotton and leather garments, and wheat flour; orders for electrical goods and air-conditioning equipment; volume of automobile financing and public merchandise warehousing; manufacturers' sales of automobiles and of paint, varnish, and lacquer; wool consumption, stocks of wool on hand, and activity of wool machinery; production and shipments of paperboard, hosiery, underwear, and malleable castings; and shipments and stocks of structural clay products and oil burners. These reports are intended to be of current rather than of historical value and are issued within a very short time after the collection of the data.