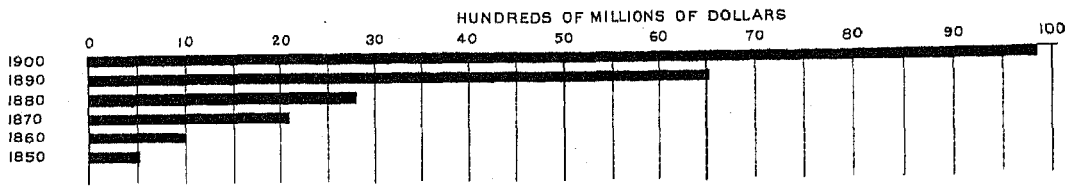
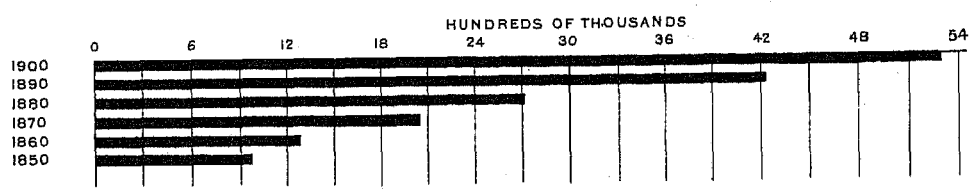
THE CENSUS OF MANUFACTURES.

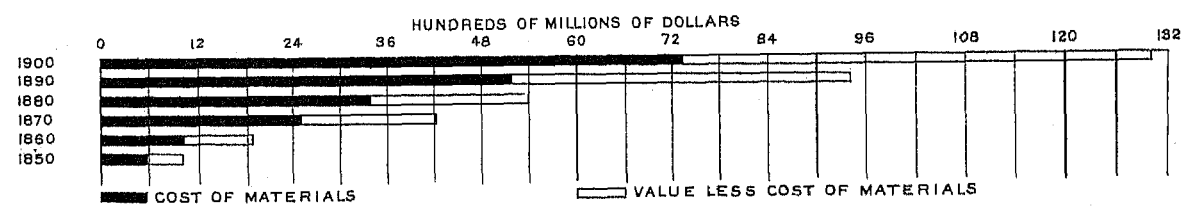
CAPITAL INVESTED AT EACH CENSUS: 1850 TO 1900



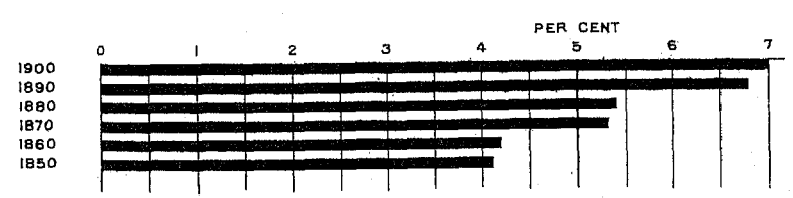
AVERAGE NUMBER OF WAGE EARNERS EMPLOYED IN MANUFACTURES AT EACH CENSUS: 1850 TO 1900



VALUE OF PRODUCTS AT EACH CENSUS: 1850 TO 1900



PROPORTION OF AVERAGE NUMBER OF WAGE EARNERS EMPLOYED IN MANUFACTURES TO POPULATION AT EACH CENSUS: 1850 TO 1900



THE CENSUS OF MANUFACTURES.

CHAPTER I.

PLAN, METHODS, AND SCOPE OF THE TWELFTH CENSUS OF MANUFACTURES.

It seems proper to preface the discussion of the statistics of manufactures of the Twelfth Census with an account of the methods and scope of the work, and of the difficulties encountered in its compilation, accompanied by some discussion of the law under which the manufacturing census was taken.

I.

THE REQUIREMENTS OF THE CENSUS ACT.

1. *Time Limit.*—The statistics of manufactures and mechanical industries have been collected, revised, tabulated, and prepared for publication within the time limit set by the act of Congress for taking the Twelfth Census, viz, within two years from the beginning of the census year, and prior to July 1, 1902. The statistics for the several states and for the leading industries were available for public use at dates much earlier, and were published from time to time in the form of bulletins. This is much less time than was required at prior censuses except that of 1870. The manufacturing statistics of the census of 1850 were not printed until the year 1859. The manufacturing and mortality statistics of the census of 1860 were printed in 1865, and thus the strange situation arose that the results of a canvass of national industry, taken prior to the outbreak of the Civil War, were not available until after that war had actually closed and the industrial conditions of the country had completely changed. The manufacturing statistics of the census of 1870 were published in 1872. For the census of 1880 these statistics appeared at different dates from 1883 to 1888, and the volumes on manufactures for the census of 1890 were published in 1895.

During the progress of the work on the Twelfth Census it has been made evident that with a proper organization, such as is possible only under a permanent Census Bureau, with ample money to expedite the canvass and the tabulation, and with the utilization of labor-saving devices in the handling of the returns, one year's time is sufficient in which properly to prepare and present the reports, if the canvass of the hand trades shall hereafter be abandoned, as is recommended in this report.

Time can be gained also by beginning the canvass five months earlier than has been attempted heretofore, i. e., January 1, instead of June 1. There is no good reason why the census year, so far as relates to the manufacturing inquiry, should end June 1, the date of the population census. The permanent Census Office can begin its field work for the Thirteenth Census immediately upon the close of the year 1909 with obvious advantage. Probably nine-tenths of our great manufacturing establishments close their books at or near the close of the calendar year, and are better prepared at that time than at any other to furnish the reports required by the Census Office. Indeed, a very large proportion of the reports made at the Twelfth Census actually related to the business of the calendar year 1899, this being permitted under section 7 of the census act, which provided that "the information collected shall be of and for the fiscal year of such corporations or establishments having its termination nearest to and preceding the first of June, 1900." The advancement of the date would, therefore, result in a much greater uniformity in the year reported than is possible under the present system, which delays the beginning of the canvass until June 1. The Director of the Census of 1900 realized this fact, and ordered that the manufacturing canvass in the largest three cities, New York, Chicago, and Philadelphia, should commence on May 1 of the census year, thus making possible the gain of a month in the work in those cities.

The early completion of the work of tabulation was facilitated by the use of various mechanical devices not hitherto employed in the tabulation of census statistics of manufactures. These devices are described later under the head of "office work."

2. *Plan and Scope.*—The plan and scope of the Twelfth Census of manufactures were determined by section 7 of the act for taking the Twelfth and subsequent censuses, approved March 3, 1899. This section requires that "The schedules of inquiries relating to the products of manufacturing and mechanical establishments shall embrace the name and location of each establishment; character of organization, whether individual, cooperative, or other form; date of commencement of operations; character of business or kind of goods manufactured; amount of capital invested; number of proprietors, firm members, copartners, or officers, and the amount of their salaries; number of employees, and the amount of their wages; quantity and cost of materials used in manufactures; amount of miscellaneous expenses; quantity and value of products; time in operation during the census year; character and quantity of power used, and character and number of machines employed." The law further provides that "The form and subdivision of inquiries necessary to secure the information under the foregoing topics relating to manufacturing and mechanical industries shall be in the discretion of the Director of the Census."

Essentially the same requirements as to the schedule appeared in the census act of 1850, under which the censuses of 1850, 1860, and 1870 were taken.[1] The act of 1880 required that the same information should be elicited, but added the following discretionary authority: "With such changes of the subject-matter, emendations, and modifications as may be approved by the Secretary of the Interior; it being the intent of this section to give to said Secretary full direction over the form of the schedules of such inquiries." The act of March 1, 1889, gave the following discretionary authority: "And the Superintendent of the Census shall, with the approval of the Secretary of the Interior, prepare schedules containing such interrogatories as shall, in his judgment, be best adapted to elicit this information, with such specifications, divisions, and particulars under each head as he shall deem necessary to that end."

The phraseology of the questions of the schedule has thus been within the discretion of the Director since the census of 1880. This fact has resulted in many variations in the form and wording of the interrogatories, from census to census, but it has also been of great advantage to the work. The objection to a definitive statement in the law of the exact questions to be carried upon the manufacturing schedule is that it requires a schedule along lines which experience may show the advantage of modifying, particularly in the direction of condensation and simplicity.

[1] The schedule specified by the act of 1850 was as follows: 1, Name of the corporation, company, or individual producing articles to the annual value of $500; 2, Name of business, manufacture, or product; 3, Capital invested in real and personal estate in the business. 4, Raw material used, including fuel; quantities; kinds; values. 5, Kind of motive power, machinery, structure, or resource. 6, Average number of hands employed; male; female. 7, Wages; average monthly cost of male labor; average monthly cost of female labor. 8, Annual product; quantities; kinds; values.

II.

IMPROVEMENTS IN THE PRESENTATION OF STATISTICS AT THE TWELFTH CENSUS.

Although the general scope of the manufacturing census of 1900 was thus limited by the law to an exact parallel of the census of 1890, so far as the schedule was concerned, it has nevertheless been possible to introduce several important modifications in the presentation of the statistics, which mark a distinct advance in this branch of census work. The most striking of these improvements may be summarized as follows:

(1) The treatment of each state and territory as a distinct entity—the statistics of the state as a whole, and all its cities and counties being presented together in one volume, instead of being published in two separate volumes, as was the case in 1890. Accompanying the statistics of each state is a brief description of the origin and character of its leading manufacturing industries.

(2) A division of the statistics into those for the hand trades and those for manufactures proper, and a separate presentation of the statistics of each of these widely different forms of industry.

(3) A division of industries into 15 cognate groups on the basis of the materials used, or similarity in use of products, thus permitting a proper estimate of the relative importance of each of the general branches of industry.

(4) A marked increase in the number of industries for which special reports were made. There were 6 such special reports included in the census of 1880, 20 in the census of 1890, and 59 in the census of 1900. All these reports at the present census have been accompanied by considerable historical and descriptive matter. This is the direction in which it has seemed most feasible to increase the general value and usefulness of the census of manufactures.

(5) The grouping of manufacturing establishments by the number of hands employed in each, and the further separation of those which use power, from those which do not. Only by bringing together figures presented in different parts of the volume can the student of the census of 1890 make this comparison between establishments using power and those not using it.

(6) The elimination of duplications in the statistics which show the gross value of products. It has not been possible to carry this improvement so far as is deemed desirable and necessary, but a great step in advance has been taken.

(7) The presentation of statistics for establishments according to the character of their organization.

(8) The extension of the function of the census into the field of statistical interpretation, without attempt or intention to enter the peculiar field of the economist or the sociologist.

The census of manufactures is the most difficult and complicated branch of the census work, and the experience of the office has been a feeling of the way from census to census, with distinct progress visible at each. This progress has necessarily extended the work beyond the mere gathering and presentation of statistical data into the field of intelligent interpretation; and as this function of a manufacturing census enlarges the work of the statistician, it brings him into constantly closer touch with the work of the economist and the sociologist. Nevertheless the line of demarcation remains a clear one, the function of the Census Office being to ascertain the facts, and to throw all possible light upon their interpretation and upon the limitations surrounding the use of the figures. It is the function of the economist and the sociologist, observing these limitations, to draw conclusions from the data presented. But the statistician, in order to perform his part of the work, is entitled to go to all outside sources for information which will aid in the illumination and interpretation of the statistics themselves. This has been done at the present census to a degree not hitherto attempted.

III.

SCHEDULES.

1. *The General Schedule.*—Most of the manufacturing returns were made on a general schedule, which was so framed as to be adapted to the returns of the largest factories and the smallest shops. Of the 644,058 reports tabulated, 530,470 were made upon this general schedule.[1] It contained ten questions, with numerous sub-questions, and is printed in full in Appendix A. This general schedule was an improvement over the similar schedule used at the last census, in that it was printed upon four pages, instead of eight, and contained upon the fourth page detailed instructions as to the manner in which the answer to each question should be entered. Any enumerator, special agent, or manufacturer, at all in doubt as to the nature of the information desired in response to each question, had merely to turn to the last page for his instructions.

2. *Special Schedules.*—In addition to the general schedule there were 32 special schedules prepared by the Division of Manufactures, upon which were gathered the statistics of an equal number of selected manufactures, including the most important and most complicated of our national industries.[2] These special schedules were prepared according to the plan first adopted at the census of 1880, when the importance of presenting more detailed figures regarding the leading industries of the country led to the use of 49 special schedules. There were 76 special schedules used at the census of 1890.[3]

The general criticism which experience suggests upon the manufacturing schedules of 1890 and 1900, particularly the special schedules, is that they call for too much information, and in too much detail. Experience has again demonstrated that it is impossible to obtain from the great body of the manufacturers of the country, either through the agency of enumerators and special agents or by direct correspondence, exact replies to the somewhat intricate questions which appear on these schedules.

IV.

EXPERT SPECIAL AGENTS.

In accordance with the plan followed at both the Tenth and Eleventh censuses, and under the provisions of section 7 of the census act, "expert special agents" were appointed, because of their familiarity with the industries intrusted to them, to supervise the revision and tabulation of the statistics gathered upon most of the special schedules. It is not possible to prepare scientific and satisfactory reports upon the growth and development of great and complicated industries like iron and steel, for instance, without the assistance of experts thoroughly familiar with the technical details of the manufacture, in touch with the progressive steps of their advance, and capable of coördinating the statistics with a full knowledge of their true significance. Such experts are not to be found in the clerical force of a temporary census office, and their services can not be commanded for the salaries which the law provides for the office force. With the establishment of a permanent census office, it will be possible in time to do away very largely with the necessity for employing expert special agents. It may be expected that there will develop in the permanent Census Office a number of clerks trained to an understanding of the technical details and intricacies of the industries which are specially treated, who can severally take charge of the compilation of the statistics of these industries in the Census Office itself, with full knowledge of the census methods and requirements. The permanent Census Office will gradually gather together its own

[1] With the single exception of the census of 1810, the data contained in the various reports on manufactures have been collected upon schedules prepared for this purpose. Until 1890, with the exception of the reports for a few special industries, the reports of from 20 to 45 establishments were included on a single schedule. The necessities of classification by industries, as well as the accumulation of inquiries, led, in 1890, to the use of a separate schedule for each establishment reporting.

[2] All special schedules are reproduced in Appendix A.

[3] In several cases in 1880 and 1890 there were 2, 3 or more special schedules for one industry. For the electrical industries in 1890 there were 27 special schedules. Some of those prepared in 1880 relate to industries not now included in the census of manufactures, and the information collected upon others in both 1880 and 1890 was not published. The numbers given above for these years are, therefore, not entirely comparable with that given for 1900. For reproductions of all manufacturing schedules from 1810 to 1890, see The History and Growth of the United States Census, by Carroll D. Wright and William C. Hunt, pages 304 to 536.

experts in every line of inquiry. A temporary census office can never command such service.

In time, therefore, it may be expected that the services of expert special agents can be substantially, if not altogether, dispensed with. Such agents will be required, if at all, for only a brief interval at the beginning of a census, to assist in formulating schedules in keeping with the latest development of the industries; and again at the end, to prepare the text to accompany the statistics after these have been collected, tabulated, and placed in form for final publication.

It was a part of the plan of the Twelfth Census to utilize the services of the experts only in the limited manner above indicated. This was fully set forth in a circular of the Director, dated September 30, 1899, which is reproduced in the footnote.[1]

[1] DEPARTMENT OF THE INTERIOR,
CENSUS OFFICE,
Washington, September 30, 1899.

In the division of manufactures a limited number of special agents, designated as experts, will be appointed and assigned to service in connection with the statistics of particular industries with which they are familiar, and which it is desirable to report with more technical detail than is practicable in the general report on manufactures.

The duties of these expert special agents will be largely advisory, and will not require continuous service at the Census Office or elsewhere. They will be called upon, when needed, by the chief statistician in charge of manufactures; and during the periods when thus employed they will be paid a per diem of $6. Whenever authorized to travel by the Director of the Census, their actual traveling expenses will be paid, upon proper vouchers, and an allowance of $3 per diem, the sum fixed by the census act, will be made for subsistence.

Expert special agents will aid the chief statistician in the preparation of the special schedules for the industry, or group of industries, to which they are assigned, and in maturing plans for their proper canvass; will aid in the preparation and correction of the lists of the manufacturing establishments; will assist, when necessary, in securing the returns from these establishments and in the classification, editing, and revision of the schedules; will prepare the necessary tabulation sheets; and will make the analysis of the statistics and the text of the final report on the industry, or group of industries, assigned them.

The work of classification, revision, tabulation, addition, and verification for all the industries will be done in the Census Office, under the immediate supervision of the chief statistician and the chief of the division of manufactures. This rule is imperative, in order to secure uniformity of methods and to enable the work of the division to be completed within two years, as required by the census act.

It is also necessary to the prompt completion of the work that all the manufacturing schedules shall first be handled as one mass, by geographical lines, to prepare the totals for states and territories. As rapidly as these are completed, the tabulations by selected industries will follow, and the expert special agents may then have possession of the original schedules relating to their work, for such further examination and revision of their special features as may be necessary in preparation for the tabulations and reports. The work of tabulation and addition will be done by the regular force of the division of manufactures.

Expert special agents are authorized to conduct in their own name such correspondence as they find necessary in correcting lists, in securing and revising schedules, and in obtaining information regarding the industries assigned them.

It is entirely within the discretion of the chief statistician in charge of manufactures whether the services of the expert special agents shall be utilized in the collection of reports and the classification and editing of the same, and no action shall be taken by any expert special agent in regard to the preparation of reports or other matters connected with his general duties without the approval of the chief statistician.

WILLIAM R. MERRIAM,
Director of the Census.

The office was able to carry out this purpose only in part. It was found necessary, in the revision of the special schedules, to utilize the services of the experts almost continuously from the beginning to the completion of this branch of the work. The compensation allowed expert special agents was not sufficient to enable the office to command their entire time; hence there became necessary a wide scattering of the work, and the maintenance of different offices in various parts of the country at a considerable cost. The total thus expended in the expert service of the Twelfth Census, down to the date of the publication of this report, was $53,748.77. This sum includes the salaries of experts, their traveling expenses, rent of offices, and other sundries, but does not include the salaries of the clerical assistants required, this latter item appearing among the expenses of the office force, as given on page xxix.

The industries for which special schedules were prepared at the present census, and the names of the expert special agents under whose supervision the work upon these schedules was carried on, are as follows: [1]

Edward Stanwood, Boston, Mass.:
- The cotton manufacture.
- Flax, hemp, and jute.
- Dyeing and finishing of textiles.

William J. Battison, Boston, Mass.:
- The wool manufacture.
- Hosiery and knit goods.

Franklin Allen, New York, N. Y.:
- The silk manufacture.

William G. Gray, Philadelphia, Pa.:
- The iron and steel manufacture.
  - Blast furnaces.
  - Rolling mills, steel works and forges, and bloomeries.
  - Tin-plate works.

Edward H. Sanborn, Philadelphia, Pa.:
- Power machinery.

Alexander R. Smith, New York, N. Y.:
- Shipbuilding.
  - Steel and iron vessels.
  - Wooden vessels.

H. W. Wiley, Ph. D., United States Department of Agriculture:
- Flouring and grist mills.

Henry A. Alvord, United States Department of Agriculture:
- Cheese, butter, and condensed milk.

Guilford L. Spencer, Ph. D., United States Department of Agriculture:
- The beet sugar manufacture.

[1] The expert special agents of the censuses of 1880 and 1890, and the industries assigned to each, were as follows: 1880—Edward Atkinson, cotton goods; George William Bond, woolen goods; William C. Wyckoff, silk; Peter T. Wood, mixed textile industry; James M. Swank, iron and steel; Henry Hall, shipbuilding; William L. Rowland, chemicals, salt; Joseph D. Weeks, glass, coke; S. F. Peckham, manufacture of petroleum. 1890—Edward Stanwood, cotton manufacture; S. N. D. North, wool manufacture, newspapers and periodicals; Byron Rose, silk manufacture; Peter T. Wood, dyeing and finishing of textiles; William N. Sweet, iron and steel manufacture; Charles E. Taft, shipbuilding; George A. Priest, forest industries; Joseph D. Weeks, glass, coke, refining of petroleum; Henry Bower, Henry Pemberton, jr., chemicals and allied products, salt; Henry T. Cook (resigned), clay products; Allen R. Foote, electrical industries in the state of New York; George W. Graeff (resigned), gas; R. W. Powell, glue.

Henry Gannett,[1] Washington, D. C.:
Lumber and its manufacture.
George C. Houghton, Boston, Mass.:
The leather manufacture.
Leather, tanned, curried, and finished.
Boots and shoes.
W. S. Rossiter, New York, N. Y.:
Printing, publishing, and the periodical press
Charles W. Rantoul, jr., New York, N. Y.:
Paper and pulp manufacture.
Charles Kirchhoff, New York, N. Y.:
Smelting and refining of metals.
Copper, smelting and refining.
Lead, smelting and refining.
Zinc, smelting and refining.
Charles E. Monroe, Ph. D., Columbian University (Thomas N. Chatard, Ph. D., assistant), Washington, D. C.:
The chemical manufacture.
Shirley P. Austin, Pittsburg, Pa.:
The glass manufacture.
Edward W. Parker, United States Geological Survey:
Coke.
Salt.
Petroleum refining.
Jefferson Middleton, United States Geological Survey:
Brick and clay products.
Brick yards.
Pottery products.
T. C. Martin, New York, N. Y.:
Electrical apparatus and supplies.
Daniel C. Roper, Washington, D. C.:
Cotton ginning.

In addition to the foregoing expert special agents, Mr. Davis R. Dewey, Ph. D., of the Massachusetts Institute of Technology, was appointed expert special agent in charge of a special investigation into the question of wages. The results of this investigation will be issued as one of the special reports provided for by the Act of March 6, 1902.

There were also prepared special schedules relating to the manufacture of carriages and wagons, slaughtering and meat packing, agricultural implements, gas manufacture, and railroad repair shops, for which no expert special agents were appointed.

V.

SUPPLEMENTAL INQUIRIES.

A number of supplemental inquiries were also prepared, covering the following industries:[2] Bicycles and tricycles; buttons; cars, steam railroad, not including operations of railroad companies; collars and cuffs, not including paper collars and cuffs; fish, canning and preserving; fruits and vegetables, canning and preserving; gloves and mittens (leather); ice, manufactured; machinery; pianos, organs, and musical instruments, not specified; needles and pins; oil, cottonseed and cake; oleomargarine; oysters, canning and preserving; pens and pencils; phonographs and graphophones; rice, cleaning and polishing; rubber boots and shoes; sewing machines and attachments; starch; turpentine and rosin; typewriters; watches and watch cases.

The supplemental inquiries were designed to bring out, more fully than was possible on the general schedule, certain important details regarding the industries to which they related, more particularly the kinds and quantities of materials used and the kinds and quantities of products manufactured. These details regarding manufactures it is impossible to obtain upon a general schedule which shall be equally applicable to all industries. Special reports upon all the industries named above appear in the report on Manufactures, Parts III and IV.

VI.

FIELD WORK.

1. *Local Special Agents.*—Section 7 of the census act further provides that whenever the Director of the Census shall deem it expedient, he may withhold the schedules relating to the manufacturing and mechanical industries from the enumerators, and may charge the collection of these statistics upon special agents, who shall have equal authority with enumerators with respect to the subjects assigned to them. This provision was first incorporated in the census act of 1879, upon the recommendation of Gen. Francis A. Walker, Superintendent of the Ninth and Tenth censuses, as a result of his experience in the Ninth Census. At previous censuses all statistics of the manufacturing and mechanical industries had been collected by the marshals and assistant marshals, while engaged in enumerating the population.

The collection of manufacturing statistics is attended with peculiar difficulties, which have been augmented by the formation of industrial combinations, and the general increase in the size of the individual plants. General Walker's experience in the Ninth Census revealed these difficulties and demonstrated that while the ordinary enumerator of population might safely be trusted to make a correct return of the products of a country blacksmith shop, it was impossible to expect that he would intelligently report the operations of the larger establishments engaged in complicated manufactures. Acting upon the authority conferred by the act of 1879, General Walker, at the census of 1880, withdrew the collection of manufacturing statistics from the enumerators in 279 cities and towns, and appointed special agents to make the canvass in these places. The aggregate number of days during which these special agents were employed was 16,138, and the aggregate amount of compensation was $68,825. They returned schedules for 99,401 establishments, as compared with 253,852, the total number of establishments tabulated at that census.

[1] Succeeded William L. Wallace, of Chicago, Ill., who resigned March 27, 1901.

[2] All the supplemental inquiries are reproduced in Appendix A.

The results of this special canvass were so satisfactory and the concentration of manufacturing establishments in cities had increased so largely by 1890, that at the census taken in that year Superintendent Porter withdrew the collection of the manufacturing statistics from the enumerators in 1,042 cities and towns, and appointed 1,383 special agents and assistant agents to make the canvass therein. The service was rendered at a cost of $331,698.74, a very marked increase of expense over that incurred for the similar purpose in the Ninth Census.

At the census of 1900 the number of cities and towns canvassed in this manner was increased to 1,340, 1,891 special agents being appointed and distributed among the several cities and towns, in accordance with the estimated volume of work in each.[1] The cost of the canvass was $401,839.45.

Table 1 shows the number of cities and towns canvassed by special agents in each state, the number of special agents employed, and the cost of collecting the statistics of manufactures by this means for the censuses of 1880, 1890, and 1900.

The figures given in Table 1 do not, however, convey an adequate idea of the extent of the enumeration so conducted. General Walker states that probably five-sixths of the great manufacturing establishments of the country were embraced in 1880 in the canvass conducted by special agents. Since that census the concentration of manufacturing in certain localities has greatly increased. The 1,340 cities and towns canvassed by special agents not only furnished more than half of all the schedules tabulated in this census, but the establishments covered by these schedules represented 79.1 per cent of the capital invested in manufacturing, and 81 per cent of the total value of products reported for the census year.

Of the total of 640,058 schedules tabulated at this census, more than 350,000, or considerably more than half the total, were secured by special agents. The average cost per schedule as collected in this manner was something over $1, as compared with a cost of 25 cents per schedule, the rate fixed by the census law for schedules collected by the enumerators. It may be objected that this is an exorbitant price for the Government of the United States to pay for these returns. The reasons why the manufacturing census is so expensive are discussed in detail in that section of this introduction (page xxxvii) which considers the question of a canvass of the hand trades of the country, as distinguished from its manufacturing industries.

2. *Localities Canvassed by Local Special Agents.*—At the census of 1900 all cities and towns in which the manufacturing and mechanical industries were of sufficient importance to justify the expense, were canvassed by special agents instead of by enumerators. As a rule, the population was considered in selecting these places. There are a number of cities, however, with considerable population, which are almost entirely residential, and in which manufacturing industries are insignificant. Such places were canvassed by enumerators. In determining the places to be canvassed by special agents, the office first prepared lists of all places having a population of 2,500 and over according to the census of 1890. Local directories and commercial reports were then consulted, and in cases where it appeared that manufacturing was so inconsiderable that the statistics could be collected by the general enumerators without interfering with the work of enumerating the population, these towns were omitted from the lists. The lists were then submitted to the supervisors of the population enumeration, or other persons cognizant of the industries in the respective states and territories, for criticism, at whose suggestion the names of a number of places were added and others omitted. The revised lists were then published in the form of a bulletin, which was distributed to the supervisors to be used by them in instructing the enumerators in their respective districts. The enumerators in the places canvassed by special agents were also personally instructed, by means of a memorandum on their portfolios, advising them that the statistics of manufactures in their district would be collected by special agents appointed for that purpose, and that they would be relieved of all responsibility in regard to the same.

[1] A list of the cities and towns canvassed by special agents, the number of special agents assigned to each, the names of the chief special agents, and cost of canvass in each case are given in Appendix B.

TABLE I.—NUMBER OF CITIES AND TOWNS CANVASSED BY SPECIAL AGENTS, NUMBER OF SPECIAL AGENTS EMPLOYED, AND TOTAL COST OF CANVASS, BY STATES AND TERRITORIES, 1900, 1890, AND 1880.

STATES.	Census.	Number of cities and towns canvassed by special agents.	Number of special agents employed.	Cost of canvass.
United States	1900	1,340	1,891	$401,839.45
	1890	1,042	1,383	331,698.74
	1880	284	373	68,825.00
Alabama	1900	18	12	1,566.27
	1890	18	16	1,290.85
	1880	4	4	212.00
Arizona				
Arkansas	1900	5	4	609.25
	1890	4	4	232.00
	1880	1	1	80.00
California	1900	16	52	8,128.00
	1890	13	24	8,061.97
	1880	5	9	2,658.00
Colorado	1900	8	13	2,088.25
	1890	9	11	1,648.40
	1880	1	1	100.00
Connecticut	1900	61	53	7,804.59
	1890	63	32	5,856.40
	1880	12	12	1,148.00
Delaware	1900	2	5	1,727.42
	1890	1	1	500.60
	1880	1	1	240.00
District of Columbia	1900	1	18	3,988.95
	1890	1	6	2,721.25
	1880	1	4	850.00
Florida	1900	3	5	552.00
	1890	2	2	288.00
	1880	2	2	96.00
Georgia	1900	17	18	1,983.60
	1890	15	13	1,432.00
	1880	5	5	400.00
Illinois	1900	70	127	33,906.52
	1890	54	85	18,334.25
	1880	22	29	3,853.00
Indiana	1900	81	63	16,261.08
	1890	62	46	5,322.70
	1880	12	12	1,662.00
Iowa	1900	39	38	6,175.17
	1890	33	21	3,068.74
	1880	11	11	894.00
Kansas	1900	36	23	2,933.99
	1890	30	15	1,866.65
	1880	4	4	260.00
Kentucky	1900	18	23	4,406.45
	1890	17	26	3,988.35
	1880	6	10	1,272.00
Louisiana	1900	5	15	5,377.40
	1890	3	19	4,072.75
	1880	1	5	1,486.00
Maine	1900	43	29	4,629.30
	1890	36	35	3,312.95
	1880	5	5	418.00
Maryland	1900	7	44	11,905.83
	1890	4	22	6,986.17
	1880	4	10	2,116.00
Massachusetts	1900	118	160	32,967.55
	1890	102	121	29,092.87
	1880	35	41	5,810.00
Michigan	1900	63	65	11,075.64
	1890	53	66	8,319.40
	1880	8	10	1,527.00
Minnesota	1900	27	56	7,772.32
	1890	18	29	7,879.15
	1880	3	3	828.00
Mississippi	1900	11	7	548.50
	1890	4	4	445.00
	1880	2	2	120.00
Missouri	1900	25	81	14,718.15
	1890	23	67	13,008.27
	1880	5	11	2,642.00
Montana	1900	4	3	482.50
	1890	3	2	157.95
	1880			
Nebraska	1900	10	16	$2,594.77
	1890	13	13	2,971.51
	1880	1	1	100.00
Nevada	1900	3	3	122.00
	1890	2	1	115.00
	1880	1	1	60.00
New Hampshire	1900	29	21	3,521.56
	1890	20	12	1,784.62
	1880	5	5	288.00
New Jersey	1900	44	56	12,938.11
	1890	29	33	10,283.85
	1880	13	14	2,852.00
New Mexico	1900	3	3	160.00
	1890			
	1880			
New York	1900	106	344	88,771.83
	1890	105	190	63,481.31
	1880	37	58	19,342.00
North Carolina	1900	15	11	1,052.80
	1890	12	12	913.00
	1880	3	3	160.00
North Dakota	1900	2	2	200.00
	1890	3	3	140.00
	1880			
Ohio	1900	101	114	23,230.27
	1890	74	104	34,545.05
	1880	17	24	6,032.00
Oklahoma	1900	2	2	186.00
	1890			
	1880			
Oregon	1900	6	9	1,382.00
	1890	1	1	754.00
	1880	1	1	75.00
Pennsylvania	1900	133	187	51,357.93
	1890	62	175	68,412.61
	1880	20	35	7,132.00
Rhode Island	1900	24	25	6,476.60
	1890	15	24	3,522.95
	1880	6	8	1,172.00
South Carolina	1900	12	11	1,172.54
	1890	12	15	1,421.50
	1880	2	2	144.00
South Dakota	1900	2	2	160.00
	1890	2	2	99.52
	1880			
Tennessee	1900	18	17	2,387.90
	1890	21	17	1,248.65
	1880	4	4	340.00
Texas	1900	30	31	3,872.34
	1890	20	22	1,353.00
	1880	4	4	320.00
Utah	1900	8	7	948.95
	1890	4	4	349.35
	1880	1	1	100.00
Vermont	1900	21	12	1,704.61
	1890	24	19	1,403.03
	1880	2	2	140.00
Virginia	1900	23	26	4,152.00
	1890	18	19	3,433.15
	1880	7	6	656.00
Washington	1900	9	9	2,230.70
	1890	5	5	439.00
	1880			
West Virginia	1900	6	8	1,342.06
	1890	2	2	810.00
	1880	1	1	140.00
Wisconsin	1900	53	59	10,174.75
	1890	38	41	6,239.57
	1880	9	11	1,100.00
Wyoming	1900	2	2	96.00
	1890	2	2	91.40
	1880			

The municipal divisions canvassed by special agents in the New England states were towns, including cities and villages, and other minor divisions, situated within the town limits; in New York and Wisconsin, cities and villages; and in all other states, cities, boroughs, villages, and towns as distinguished from townships, or the "towns" of New England. Wherever the phrase "urban manufactures" is used in the Report on Manufactures, it applies only to those manufacturing establishments which lie within the limits of such municipal divisions, canvassed by special agents.

3. *Grouping Contiguous Localities.*—In assigning the canvass of cities and towns to special agents, the plan was adopted for the first time of grouping contiguous localities and placing the entire canvass of each group under the general supervision of one chief special agent. This plan was found to work admirably. It concentrated authority, secured uniformity of canvass in the several localities embraced in the group, and resulted in a much cleaner canvass than would otherwise have been possible. It is frequently the case, for example, that many manufacturing establishments are located a little outside of city limits, often in suburbs which are under a separate local government, but which are regarded as a part of the municipality for all commercial purposes. A canvass to be thorough requires that one special agent shall have supervision over the work of an entire neighborhood thus divided up into several municipal entities.

Some difficulty was experienced in cases where several establishments, located sometimes in different parts of the country, were controlled by one corporation. Usually the reports for such establishments were secured from the central office and credited to the special agents in the several localities.

4. *Time Required for the Canvass.*—It was calculated that the local special agents would be able to complete the canvass in thirty days from the date of beginning—a calculation based upon the assumption that the special agents would collect an average of six schedules per day. It was found, however, in actual experience, that this average was higher than it was possible to attain, notwithstanding the constant instructions of the office to those special agents whose daily report cards indicated that their work was below the average expected. Instead of thirty days, two months were required, in many instances, to complete the canvass, and in several of the larger cities, four and even five months were occupied in the work.

5. *Supervisors as Local Special Agents.*—In many of the large cities of the country, the supervisor of population was selected to act as chief special agent for the collection of the manufacturing statistics. This selection was due to the belief that a concentration of the supervision of all branches of the census work for a given locality in the person of one individual must prove to the general advantage of efficiency and thoroughness. As a matter of fact, however, it was found in numerous cases that the supervisors were so engrossed with the population work that they neglected the manufacturing canvass, and the completion of the field work for manufactures was seriously retarded in consequence. The adoption of this method of selecting chief special agents can not, therefore, be unreservedly recommended for future censuses.

Supervisors of the enumeration of the population were very generally instructed to stimulate their enumerators by the promise of appointments as local special agents for manufacturing statistics as a reward for diligence and efficiency in their population work. This plan resulted in securing, in a number of localities, a higher grade of local special agents than the Census Office had been able to command at previous censuses.

6. *State Special Agents.*—In several states, the plan was adopted for the first time of entrusting the supervision of the collection of the manufacturing schedules of the state to a single chief special agent, giving him jurisdiction over the work in all the cities and towns of the state. This experiment was made only in certain smaller states where manufacturing interests were unusually developed. The supervision of the work in Massachusetts was given to the Hon. Horace G. Wadlin, chief of the Massachusetts Bureau of Statistics of Labor, who was also the supervisor for population in that state, and whose long experience in the collection of both population and manufacturing data for the State Bureau had qualified him to discharge his duties with the highest degree of efficiency and economy. Mr. George H. Webb, secretary of the Providence Chamber of Commerce, and supervisor of population for the state of Rhode Island, was placed in charge of all the special agents employed in that state. Mr. William A. Countryman, of Hartford, formerly chief clerk of the Connecticut Bureau of Labor Statistics, was appointed chief special agent for Connecticut, and under his supervision the field work in that state was admirably done. Mr. William H. Stinson, formerly chief clerk of the New Hampshire Bureau of Labor Statistics, had general supervision of the field work in his state. In all these cases, the plan of centralizing the responsibility for field work in a single person was justified by the results.

The peculiar conditions surrounding the collection of manufacturing statistics in the Hawaiian Islands led to the appointment of Mr. Alatau T. Atkinson as chief special agent in charge of the entire canvass in that territory. Mr. Atkinson was also special agent in charge of the enumeration of the population.

7. *Inspecting Special Agents.*—In addition to the $401,839.45 paid for the canvass by special agents, $35,916.14 was expended for the services of a group of inspecting special agents, numbering 18 at its maximum, most of them trained men, whose services were kindly

loaned by the Commissioner of Labor. They were employed by the division of manufactures to visit the more important towns of the territory assigned to them severally, for the purpose of instructing the local agents in their work, pushing them to more energetic endeavors to complete the canvass, and correcting any mistakes they were found to be making in filling out schedules. In some instances, where the local agents proved to be indolent or incompetent, the inspecting agents took charge of the local canvass and completed it.

This plan of an organized force of inspecting special agents was new in the census of 1900. It proved of so great advantage in expediting the work and improving its quality that the same system of inspection may well be adopted by future censuses.

8. *Returns from Local Special Agents.*—The work of the local special agents was of all grades of excellence, many of them showing great conscientiousness and care in the filling of their schedules, while the work of others was equally striking for its slovenliness and lack of attention to instructions. The general character of the work was greatly improved by a test which was applied to each special agent before his appointment. Blank schedules were sent to each applicant, with the request that they be filled out in such a way as would comport with the probable number of employees, cost of materials, value of products, etc., in a hypothetical establishment with a capital of $25,000, and an average of 18 employees during the year. When the test revealed the applicant's unfitness for the work, his appointment was refused. In other cases the schedules were returned with such corrections and suggestions as would assist the agent in his work.

Under the law creating the permanent Census Office, it will be possible to utilize in the field the services of many of the clerks of the regular office force. It will, moreover, enable the Director to put into the field men who are acquainted with the Census Office methods, thoroughly posted as to the exact information desired, and tested as to their competency and faithfulness. These are qualifications which it has been impossible to secure with certainty in a temporary Census Office.

9. *Returns from Enumerators.*—In contrast with the work done by the special agents, that of the enumerators was very poor. Comparatively few of them showed, by the character of their work, that they had given careful attention to the instructions for filling out the manufacturing schedule; and the card catalogue of establishments kept in the office furnishes conclusive evidence that many of the enumerators omitted altogether certain of the hand trades, which the census law includes in the industrial census, and which they were instructed to canvass.

10. *Sample Schedules.*—In addition to the instructions printed upon the back of each schedule, every enumerator and special agent received a booklet giving more detailed instructions regarding his work.[1] As a further aid to enumerators and special agents, the office adopted, for the first time, the expedient of preparing sample schedules, copies of which were forwarded to each enumerator and special agent with his supplies. These related to a blacksmithing establishment, a cigar factory, a saddlery and harness establishment, and a foundry; and hypothetical answers were inserted to each question, showing just how the office expected that each entry would be made. It is impossible, of course, to say to what extent these sample schedules served the purpose for which they were planned. It is, however, the judgment of men familiar with the work of both the 1890 and the 1900 censuses, that the schedules were returned in the latter year in considerably better condition than at the Eleventh Census. The sample schedule is an obvious and simple expedient for improving the quality of the field work, and so long as the enumerator is relied upon for any portion of this work it should be continued.

VII.

OFFICE WORK.

1. *Card Catalogues.*—Prior to the commencement of the field work, much time and study were devoted to plans for rendering that work thorough and complete in every locality. A card catalogue was prepared of all establishments of productive industry throughout the United States of which a record could be found. In this work city directories were utilized wherever they existed, supplemented by trade directories, the reports of factory inspectors, the lists of the commercial agencies, and notices of new factories sent to the office by newspaper clipping bureaus. Supplemental card catalogues were also made for each of the leading industries.

The cards thus prepared for the greater cities were numbered and forwarded to the chief special agent, who was required to return every card marked to show whether a schedule had been secured for the establishment, and if not, the reason why, as "burned," "removed," "not manufacturers," etc. The cards for the smaller cities were retained in the office, and the schedules as received were checked upon them. When the local agent announced his work complete, he received from the office transcripts of all cards for which schedules had not been received, and was required to furnish the missing returns or supply a satisfactory reason why they could not be obtained. In this way the office possessed a complete check upon the work of every special agent, and was thus able to secure a more thorough and satisfactory canvass than had ever before been obtained. It would be impossible, without

[1] These instructions are reproduced in Appendix C.

some such check, to determine when the canvass of any city or town had been thoroughly and satisfactorily completed.

Wherever the card catalogues revealed the failure or neglect of an enumerator or special agent to secure a return for an existing establishment, the attempt was made to obtain the same by correspondence, often successfully. In the case of some very large establishments thus overlooked, it was necessary to send a special agent directly to the establishment in order to secure a return. In many such instances the failure to secure a return on the first canvass was due to the fact that the manufacturing establishment was located beyond the city limits and fell, therefore, within the jurisdiction of the enumerators, who neglected it. The growing tendency of manufacturing establishments to locate in this manner at points convenient to a great city but outside its corporate limits, increases the difficulties of a thorough canvass of manufactures, which can be fully overcome only by the use of the card catalogue just described.

By this means, before the canvass was finally closed, the office had obtained a schedule for every known establishment of any importance in the United States. The number of omissions of small establishments engaged in some of the hand trades is known to be large; but no definite statement of the percentage of omissions in this class of establishments can be ventured. This much closer canvass accounts, in a large degree, for the increase in the number of establishments reporting in 1900, as compared with 1890, only a portion of that increase being due to growth during the interval.

The supplemental card catalogues prepared for the great leading industries have been preserved, and, Congress having made the Census Office permanent, they will be of great value in preparing for the next census of manufactures. It will be a comparatively simple matter to keep these catalogues revised from year to year, and thus preserve a chronological history, so to speak, of the leading industries of the country. With such a record those in charge of the next census can ascertain, in advance of the field work, for purposes of reference, the names and addresses of all the establishments which reported in 1900, as well as the names and addresses of all new establishments in the same line of industry in the interval between the two censuses.

It is difficult to exaggerate the gain in accuracy and completeness that is likely to come to the census of manufactures by the establishment of a permanent census office, which will make possible the preservation and continuation of these records. At the present census it was not practicable, as a rule, to refer to the returns made in any industry in 1890. In many instances such a reference, had it been possible, would have afforded a test of the accuracy of the return and a means of verification superior to any at the disposal of the division. The number of establishments engaged in manufactures proper in the United States is not so large that a complete chronological record can not thus be kept at small expense.

2. *Preliminary Examination of Schedules.*—Another expedient used at the present census for improving the work of special agents was the immediate preliminary examination of a number of schedules from each special agent as they were received. Whenever this examination revealed careless work or a misunderstanding of instructions on the part of any special agent, his attention was immediately called to this fact, with instructions to retake such incorrect schedules. This rapid revision of schedules at the beginning of the canvass resulted in a very marked improvement in the work of special agents as the canvass progressed.

VIII.

CLASSIFICATION OF INDUSTRIES.

The schedules as received represented many hundreds of different manufacturing operations. A large number of these are popularly regarded as separate and distinct industries. For obvious reasons it is impossible to present statistics for each of these minor industries separately, and the office has, therefore, formulated a classification of industries at each census since 1820, and all reports received from manufacturers have been classed under one or another of these industries or classes of industries.[1] There were 261 industries shown separately in 1850, 631 in 1860, 390 in 1870, 332 in 1880, 369 in 1890, and 354 in 1900. In addition to the changes made in the number of separate industries, by subdivision and by grouping, the names of the industries themselves have been changed in many cases.

All changes of classification are to be regretted, for they make it difficult, and at times impossible, to trace the development of a given industry through successive census periods. It is true, of course, that certain changes are unavoidable because of radical modifications which take place in the various processes of manufacture; but it is safe to say that the majority of the changes which have been made since 1880 have not been due to this cause, but to the repeated changes in the office force, with whose chief officers this question of classification has rested. It is to be expected that the establishment of a permanent census office will result in much greater uniformity in this regard.

1. *Changes of Classification Since 1890.*—At the census of 1890 there were 369 classes of industries shown separately in the general tables. At the present census there are 354, 14 classes having been added and 29 eliminated, making a net decrease of 15.

The 14 new classes have been established either by the inclusion of statistics for industries not included

[1] A list of the 354 industries shown in 1900, with the more important products included under each, is given in Appendix E.

in 1890, or by the subdivision of classes used at the prior census; while the 29 classes have been eliminated by consolidation of industries formerly separately presented, or by exclusion of certain kinds of work from the census of manufactures.

"Butter, reworking" and "tin and terne plate" are industries which have practically been established since the last census and are shown for the first time. The reduction of the ores of lead, copper, and zinc was not considered as strictly a manufacturing operation at previous censuses. There was a class, "smelting and refining," which, with the addition of the words "not from the ore," has been retained. Probably some ore-reducing plants were reported in 1890 and included in this class, for while the number of establishments increased from 50 to 61, the value of products decreased from $28,188,826 to $7,784,695. In 1890 there were also reported 8 "zinc" establishments, but no comparison can be made with the industry at this census. "Copper, smelting and refining," "lead, smelting and refining," and "zinc, smelting and refining," may therefore be considered as industries first reported at this census.

"Wool pulling" and "wool scouring" occupy positions analogous to the smelting industries. When those operations were carried on in connection with the wool manufacture, the report for the factory included the pulling and scouring; but except under this condition the industries were not reported at the census of 1890.

"Electrical construction and repairs" and "typewriter repairing" are also new classes at this census, although the operations covered by them were reported at former censuses in smaller volume. Their statistics were probably included under other classes, such as "lock and gun smithing," "sewing machine repairing," or in the reports of other small shops doing repair or mechanical work, or else under the larger industries upon which they are dependent, viz, "electrical apparatus and supplies" for the former industry, and "typewriters and supplies" for the latter.

"Charcoal," while not separately shown, was included with "timber products, not manufactured at mill" when reported. "Cotton small wares" has now been set off from "cotton goods."

Three industries shown in 1890 have been subdivided into two classes each: "hats and caps, not including wool hats" is now shown as "fur hats," and "hats and caps, not including fur hats and wool hats;" "painting and paper hanging" is now divided into the two classes "painting, house, sign, etc.," and "paper hanging;" "shipbuilding" appears as "shipbuilding, iron and steel," and "ship and boat building, wooden."

Of the classes which have been discontinued, 5 are not considered manufacturing industries under the definition adopted in the present census. They are: "coffins and burial cases, trimming and finishing;" "dentistry, mechanical;" "electric light and power;" "hay and straw baling;" and "teasels."

The reports for establishments classed in 1890 under the category "coffins and burial cases, trimming and finishing" were composed largely of returns from undertakers who did some trimming and finishing of caskets in connection with a general undertaking business. At the present census, returns of this character were omitted; but in all cases where the establishments were also engaged in furniture manufacture or repairing, or other branch of industry or repair work, the returns were classified with the industry to which they belonged. If they manufactured caskets, burial cases, and undertakers' goods for the trade, their reports were included under the class "coffins, burial cases, and undertakers' goods." Of the 4 remaining classes mentioned in the preceding paragraph, "electric light and power" is to be made the subject of a special census investigation; "hay and straw baling" and "teasels" are more essentially agricultural than manufacturing, and "dentistry, mechanical" is so inextricably involved with the rendering of professional services that no attempt has been made to secure statistics for it.

At this point it is proper to mention the omission from the present census of a large number of retail druggists, although no change appears in the name of the class. In 1890, 1,805 establishments were reported under the caption "druggists' preparations, not including prescriptions," compared with only 250 in 1900. It is quite probable that the great majority of those reported in 1890 were retail dealers, a class which is not included in the Twelfth Census.

Six classes in 1900 are each the result of consolidations of two or more classes formerly used. "Enameling and enameled goods" takes the place of "enameled goods" and "enameling;" "explosives" includes "gunpowder" and "high explosives;" "leather, tanned, curried, and finished" replaces the four classes, "leather, dressed skins," "leather, morocco," "leather, patent and enameled," and "leather, tanned and curried;" "lumber and timber products" supplants "lumber and other mill products from logs and bolts" and "timber products not manufactured at mill;" "oil, not elsewhere specified," includes "oil, illuminating, not including petroleum refining," and "oil, lubricating;" (if any returns were received for "oil, resin," they also were classified under the same title); "paper and wood pulp" combines "paper" and "pulp, wood."

The establishments reported under the 14 remaining discontinued classes were included under other classes, whose scope has thus been enlarged without change in phraseology. "Bagging, flax, hemp, and jute" is included in "bags, other than paper;" "bellows," with "leather goods;" "celluloid and celluloid goods" is

distributed. Establishments manufacturing celluloid were classed as chemical manufactures. If the establishment manufactured articles from celluloid, the report was classified according to the character of the finished product, many of them being included under the class "furnishing goods, men's;" "fancy articles, not elsewhere specified," or "stationery goods, not elsewhere specified." "Cigar molds" is included with "models and patterns;" "clock cases and materials," with "watch and clock materials;" "cotton ties" and "lightning rods" are included with "foundry and machine shop products;" "fruit-jar trimmings," with "stamped ware;" "furniture, chairs," with "furniture, factory product;" "pencil cases," with "stationery goods, not elsewhere specified;" "printing, tip," with "printing and publishing, book and job;" "racking hose" with "belting and hose, leather;" "rubber, vulcanized," with "rubber and elastic goods;" and "thread, linen," is included with "linen goods."

In several classes a change of phraseology was adopted, principally for the purpose of more exactly defining the objects embraced. The most important of such changes are as follows: "gas and oil stoves" was shown in 1890 as "gas stoves;" "graphite, and graphite refining" as "graphite;" "ice, manufactured," formerly "ice, artificial;" "photolithographing and photo-engraving" in place of "photolithographing and engraving;" "plumbing, gas and steam fitting," shown as "plumbing and gas fitting;" "pottery, terra cotta, and fire-clay products," shown as "clay and pottery products;" "smelting and refining, not from the ore," shown as "smelting and refining;" and "turpentine and rosin" was in 1890 shown as "tar and turpentine."

2. *Basis of Classification.*—The reports for individual establishments were classified according to the product of chief value, so as to bring together those for all establishments engaged in the same industry. Therefore, though there may appear a great number of establishments in a certain class of industry, it does not follow that the articles included in that class are not also manufactured in other establishments. The manufacture of "iron and steel, nails and spikes, cut and wrought, including wire nails," is shown as a separate industry, but some of the establishments which are classified as "iron and steel" also make nails. In fact, a large proportion of the wire nails are made in iron and steel rolling mills. Therefore the figures for "iron and steel nails and spikes, cut and wrought, including wire nails," can not be accepted as showing the entire nail production in the respective states during the census year, nor should they be considered as referring to nails as the sole product. In 1890 the industry "iron and steel" in the general tables of manufactures did not include establishments whose finished product consisted of nails. In order to compare the statistics for iron and steel at the two censuses, reference should be made to the special reports on the industry in the Report on Manufactures, Part IV.

Numerous examples of this uncertainty of boundary between classes of industries could be given, but the case cited is sufficient to point out the limitations which must exist where the entire establishment is included in one report and classified accordingly.

IX.

HANDLING OF SCHEDULES.

1. *Examination and Correction.*—The quantity of obviously erroneous information received by the Census Office in reply to its inquiries addressed to manufacturers is appalling, as is also the amount of clerical labor involved in editing and correcting the defective schedules, by correspondence or otherwise. The methods adopted by the division of manufactures for the purpose of securing the needed corrections, when it was impossible to obtain them by direct correspondence, are clearly indicated in the rules adopted for the revision of schedules, which are reproduced in Appendix D of this volume.

These rules emphasize the importance of great care on the part of the revisers in changing any figures originally reported by manufacturers. Yet the necessity for some discretion in the matter is obvious. Many of the schedules as returned revealed upon their face a purpose to mislead and deceive the Census Office, and many others showed an obvious misapprehension of the significance of the questions asked. Some of these questions serve as a check upon the accuracy of the answers given to others. For instance, when a schedule indicates a certain amount paid for raw materials, a certain amount paid for miscellaneous expenses, a certain amount paid for wages and for sundries, and returns a value of product considerably less than the sum total of these alleged payments, it is obvious that the discrepancy is due either to a considerable loss in the conduct of the establishment or to a misunderstanding of certain of the questions on the part of the maker of the schedule. Moreover, when a value of products is returned double or treble the sum total of the other items indicated, it at once becomes a question whether the return is not false or erroneous. In the case of all important establishments these errors were corrected by correspondence. In all other instances they were corrected by the application of the ordinary rules which require a definite relationship between these general items.

2. *Tabulation.*—The majority of the general schedules were tabulated upon a typewriter fitted with a tabulating attachment. This was an innovation and proved very successful. The tabulation was made in duplicate, the second copy being afterwards cut and pasted in such a way as to bring together all the establishments of an industry in any one state. In this way the retabulation of a great mass of figures was dispensed with.

Another device employed was the adding machine, two varieties of which were constantly in use in the division, more than seventy-five of them being employed at one time. It was found by experience that one clerk, by the use of an adding machine, could accomplish as much work, day in and day out, as four clerks could accomplish when adding mentally. It was also found that

the liability to error in addition was greatly reduced by the use of the adding machines, although not altogether eliminated. It is a question worthy of consideration, in connection with future censuses of manufactures, whether or not the Hollerith tabulating system, used in the population and agricultural work of the Twelfth Census, can not be adapted to the work of the division of manufactures, with a corresponding gain in shortening the time required for tabulating the results.

In tabulating the returns, care was taken in 1890, and also at the present census, to publish no figures which would disclose the operations of individual establishments, the general rule being established that no statistics should be published separately for less than three establishments. The statistics for industries, states, or cities represented by but one or two establishments were combined and presented under the omnibus classes "all other industries," "all other states," or "all other cities."

Though the necessity of this treatment of such returns is obvious, it has caused great difficulty when attempts have been made to make comparisons between certain statistics for 1890 and for 1900. For example, if the three establishments which reported for a given industry in a given city in 1890 combined into one large establishment during the decade, and no new establishments were added, the industry would be shown separately in 1890, and included under "all other industries" in 1900. This makes comparison between the two census years impossible, and also gives the casual user of the tables an impression that the industry disappeared during the decade from the city in question, although as a matter of fact the production may have greatly increased.

In the tabulation process there are numerous points at which the accuracy of the totals may be tested by comparison with other totals with which they should agree. Thus all the totals for a state tabulated by counties should agree with the corresponding totals obtained for the state tabulated by industries. Such a system of checking was applied throughout the entire process of tabulation, but not to the extent desirable on account of the limited time allowed by law for the completion of the work. It is probable, therefore, that certain inconsistencies in the smaller totals may be revealed by comparing totals with which these should agree. Such discrepancies should not, however, be regarded as indicating errors in the larger totals. The presumption must be that these latter are accurate, since they are the result of numerous combinations, each checking the other. Nevertheless, the existence of errors in the tables, both typographical and clerical, is admitted, and was unavoidable.

X.

COST OF THE CENSUS OF MANUFACTURES.

The great increase in the scope of the census of manufactures in recent years has resulted in a considerable increase in the cost. The total cost was $973,909.54 in 1890 and $1,211,952.87 in 1900.[1] The following table shows the various items which constitute this latter sum, for the years 1899, 1900, 1901, and 1902 prior to June 1:

TABLE II.—*Expenditures.*

YEAR.	Total.	Office force.	Special investigations.	Canvass of towns, cities, etc., by special agents.
1899	$12,322.40	$11,270.95	$558.85	$492.60
1900	586,719.49	104,642.65	44,659.81	437,417.03
1901	445,744.83	330,212.35	95,829.74	19,702.74
To June 1, 1902	167,166.15	130,976.05	35,426.10	764.00
	1,211,952.87	577,102.00	176,474.50	458,376.37

The maximum clerical force of the division of manufactures was 412, on September 28, 1901.

XI.

THE COMPULSORY FEATURE OF THE INQUIRIES.

Difficulty was experienced at the Twelfth Census, as at all prior censuses, in obtaining from certain manufacturers the information called for in the manufacturing schedules.

1. *Defects in the Census Act of 1889.*—At the Eleventh Census the number of refusals to supply the information required by law was quite large, and in consequence the returns of several important manufacturing establishments of the country were omitted entirely. Very early in the canvass of 1890, Superintendent Porter discovered that this difficulty was to be encountered, and that it was the more serious because the act of 1889, under which he worked, had failed to make proper provision for this contingency. There was in that law, as originally passed, no provision requiring manufacturers to answer the specific inquiries of the schedule and no penalty imposed for a failure to supply this information within a reasonable length of time. Superintendent Porter, therefore, asked Congress to amend the law, and the following amendment to the census act, constituting chapter 153, laws of 1892, was enacted on July 6 of that year:

> That sections fifteen and seventeen of the act entitled "An act to provide for taking the Eleventh and subsequent censuses," approved March first, eighteen hundred and eighty-nine, be, and the same are hereby, amended so that the *Superintendent of Census shall be required* to obtain from every incorporated and unincorporated company, firm, association, or person engaged in any productive industry the information called for and specified in the general and special schedules heretofore approved or to be hereafter approved by the Secretary of the Interior. And every president, treasurer, secretary, agent, director, or other officer of every corporation engaged in such productive industry, and every person, firm, manager, or agent of unincorporated companies, and members of firms, associations, or individuals likewise engaged in such productive industry, from which or whom answers to any of the inquiries contained in the said schedules are *herein required*, who shall, if thereto

[1] These figures do not include administrative costs chargeable to the division of manufactures, or the amount paid to enumerators for the collection of schedules of manufactures.

requested by the Superintendent of Census, supervisor, enumerator, or special agent, or each or any of them, willfully neglect or refuse to give true and complete answers to any inquiry or inquiries contained in the said schedules, or shall willfully give false information in respect thereto, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined in a sum not exceeding ten thousand dollars, to which may be added imprisonment for a period not exceeding one year. And all acts or parts of acts in conflict herewith are hereby repealed.

Subsequently to this enactment the Census Office prepared a test case against one Jethro G. Mitchell, treasurer of the Mitchell & Rowland Lumber Company, of Ohio, who had refused, after repeated solicitation, to make answers to the questions contained upon the special schedule relating to the lumber industry. Mitchell was accordingly indicted by the Federal jury sitting for the northern district of Ohio, and at the December term the indictment was quashed by the presiding judge, Augustus J. Ricks. No appeal was taken in this case, and a number of similar indictments which had been obtained in different sections of the country were allowed to lapse. The indictment in the Mitchell case was quashed on the ground that the "law did not require firms engaged in productive industry to answer questions propounded by or contained in the schedules of the Census Office, and that refusals to answer such questions had not been made and declared by law to be an offense." Judge Ricks argued in part as follows:

It may be said that Congress manifestly intended to impose such a duty and that it is clearly implied from the law. But this is a criminal proceeding, and, to confer jurisdiction on the Federal courts in such cases, an offense must be clearly defined and created by statute. We have no jurisdiction over any other offenses. * * * We can not extend the law to cover a failure to do an act required to be done *only by implication of law.*

To make the failure or refusal to perform a duty a criminal offense cognizable in this court, the act of Congress must clearly define that duty and declare the punishment. That has not been done.[1]

This failure of the law, as amended, clearly to define the duty of manufacturers to answer the questions contained in the schedules of manufactures is conspicuous. "*The Superintendent of the Census is required to obtain*" answers to these questions, according to the wording of the amendment, although it was plainly the intention of the framers that *manufacturers be obliged to give* such answers. The compulsion was thus placed upon the Superintendent and not upon the manufacturers. The further provision of the law, which mentions the various classes from whom it was intended to require information regarding manufactures and prescribes the penalty for refusing to give the same, is also emasculated by the use of the words "*are herein required*," referring back, evidently, to the previous requirement which has been shown to be a requirement placed upon the Superintendent and not upon the manufacturers at all.

[1] 58 Federal Reporter, page 993.

The same defect appears in the act of March 3, 1899, providing for the twelfth and subsequent censuses. The clause of the amendment of July 6, 1892, which required the Superintendent to obtain from manufacturers the information contained in the schedules of manufacturers was omitted in the act of 1899, but the words "are herein required" of the earlier amendment are retained in the later act. Evidently the framers of the law assumed that elsewhere in the census act those in control of industrial establishments had been "required" to answer interrogatories in relation to certain matters pertaining to such establishments, but this is not the case. No person had been "herein required" to answer anything whatever, except as to personal matters embodied in the population schedule.

The defect does not exist in that part of the act which relates to the enumeration of the population, for in this case (section 22) the wording is "That each and every person * * * hereby is required * * * to render a true account," etc.

2. *Constitutionality of the Act.*—Counsel for the defense in the test case above referred to, besides contending that the law did not declare the refusal to answer inquiries in the schedules of manufactures a crime, argued that if the law did declare such a refusal to be a crime, so much of the law was unconstitutional. This contention was based on the following grounds:

(*a*) The object of the census enumeration is solely to establish a basis of apportioning representatives among the states, or to provide for laying direct or capitation taxes.

(*b*) The guaranty of article 4 of the bill of rights that the people shall be secure in their persons, houses, papers, and effects against unreasonable searches and seizures would be violated by the enforcement of the census act.

(*c*) The guaranty of article 5 of the bill of rights "Nor shall any person be deprived of life, liberty, or property without due process of law, nor shall private property be taken without just compensation" also would be violated by carrying out the requirements of that act.

After quashing the indictment on the basis of the first contention, Judge Ricks added the following *obiter dictum* regarding the constitutional questions raised by the defense:

In view of the conclusion reached under the first objection to this indictment, I might possibly pass this grave objection without further consideration, *but, as future legislation will be necessary to remedy the defect found in existing statutes,* * * * it may not be amiss to state that *there may be a limit to the power of Congress to compel a citizen*[1] *to disclose information concerning his business undertakings, and the manner in which they are carried on.*

This limit must relate, not only to the kind of information he may properly refuse to disclose, because it may be equivalent to the appropriation of private property for public use without just compensation, but also to the *extent* of the information required, as well as the time within which it shall be given.

[1] "Citizen," whenever used herein or by Judge Ricks means simply *person.* The question of citizenship is not raised during the process of collecting taxes or public information.

Certain kinds of information valuable to the public, and useful to the legislative branches of the government as the basis for proper laws, have heretofore been voluntarily given, and may properly be required from the citizen, when it is not of property value or when the collection, compilation, and preparation thereof do not impose great expense and labor *for which compensation is not provided.*

It is not infrequent, however, that answers to questions propounded in some schedules, if fully and properly prepared, involve the collection and compilation of facts that require the labor of a large force of clerks for days and weeks, entailing great expense and embarrassment to the ordinary business of the citizen.

Is it within the power of Congress to make such answers compulsory, and require the citizen to neglect his usual business, with loss, and to prepare this information, at great personal expense, without proper compensation?

Or if a citizen, by his long experience in a special line of business, and by his superior organizing and administrative ability, has so systematized it that he can carry it on at a much less expense and with greater facility than others, is it right to compel him to disclose the information so acquired, and thereby open to his rivals in trade the methods by which he has been able to outstrip them in the sharp competition for business?

Is not the system so established, and the knowledge so acquired, as much a property right to him as the land and shops in which he conducts his business? And can he be compelled to part with the former without due compensation more justly than with the latter?

The zeal with which such information is sometimes solicited to maintain favorite theories of public officials, or to afford the basis for discussing economic questions, often leads to excesses, and imposes upon the citizen duties for which no just compensation is afforded, either in money, or his proportion of the reward of the good results to follow to the public.

As before stated, when such information is required as the basis for proper legislation or the just enforcement of public laws, the power to compel its disclosure may exist, and, if unusual expense attends its preparation, proper remuneration to the citizen can be made; but the suggestion that information having a property value may be demanded, which the citizen may not be obliged to impart without due compensation, so earnestly pressed by the learned counsel in this case, still remains undisposed of, and a proper subject for consideration by Congress in *future legislation that may be needed to enforce such demands by the Census Bureau.*

Of course, these suggestions are not intended to apply to the power of Congress to compel answers to questions, propounded to the officers of railroad, telegraph, and insurance companies, corporations of a public character, over the business methods of which the legislative power may be asserted.

As to such corporations, the public good requires that wholesome and strict supervision should be exercised, and *all the information needed as a basis for such regulation and control should be produced when required.*

In view of the conclusions reached, it is not necessary to consider other objections urged to the indictment. The demurrer will be sustained upon the first proposition considered [that Congress had not declared refusing to answer census questions to be a crime] and the motion to quash is allowed.

These contentions may be summarized as follows:

(1) The kind of information called for should not be such as has a property value, especially in the hands of competitors.

(2) The extent of the information should not be so great as to require the expenditure of any considerable time and labor by the citizen, unless compensation is made for the same.

As to the first contention, no reply is needed beyond the statement that the law prohibits and punishes disclosures of census information to "rivals in business" or to any private individual whatsoever. The facts collected by agents, enumerators, and by means of the special mail schedules are gathered under the oath of secrecy and are promptly transmitted to Washington, where the abstract statements only, disconnected from the names of those who give them, become parts of classified aggregates, in which individual items can not be traced by the public.

The second contention, regarding the time and labor needed to answer the inquiries of the schedules, must be regarded as unsound. The more complicated schedules are handled very largely by special agents who give their entire attention to the collection of the statistics of manufactures and are thus able to assist manufacturers in answering the various inquiries. The spending of any considerable amount of time or labor upon the filling out of a schedule of manufactures is usually the result of a misunderstanding of the exact nature of the inquiries, a misunderstanding which a skillful agent will anticipate and avoid. In so far as the taking of schedules is in the hands of unskillful enumerators or special agents, this objection has some force, but the standard of efficiency among these employees of the Census Office is continually increasing, and the cases are rare where any considerable burden is placed upon a citizen in order to furnish the information required.

The suggestion of Judge Ricks that manufacturers be compensated for furnishing the information regarding their establishments is thus seen to be unnecessary, and it would undoubtedly be an impossibility to apply any such suggestion practically.

It should be added that, by implication, Judge Ricks rejects the contention that census inquiries should be restricted to the mere enumeration of the population as required by the Constitution, Article I, Section 3.

It is clear, however, from what has been said above, that the census laws thus far enacted have not been so worded as to compel manufacturers to furnish the information required on the manufacturing schedules, and to make certain the punishment of any manufacturer who shall refuse this information or neglect to furnish it within a definite period. Careful attention should be paid to the framing of such a provision of law prior to the year 1905, when the five-year census of manufactures, provided for by the act creating a permanent census office, is to be taken.

3. *Refusals to answer at the Twelfth Census.*—The experience of the Twelfth Census in the matter of refusals to supply the information called for upon the manufacturing schedules was on the whole much more satisfactory than in 1890. When first approached by the representatives of the office, there were several large and important manufacturing establishments which peremptorily declined to supply the information called for upon

the schedule. In all such cases a letter over the signature of the Director addressed to the recalcitrant parties was placed in the hands of the agent, and, in the course of subsequent conferences, in which the purposes of the census act were stated, the secrecy of the return promised, and the acquiescence of the great body of manufacturers of the country in the investigation set forth, the desired information was obtained in most particulars. There were a few instances in which the character and quantities of materials used were refused, on the ground that they related to trade secrets of value, and a few other instances in which the total value of products of an establishment was refused. In these few cases the figures were estimated in the office by comparison with the returns of manufacturing establishments of corresponding size engaged in making the same products.

When the canvass was finally completed, it was found that the total list of absolute refusals to furnish any information was reduced to thirty establishments, none of which, as shown by the ratings of the commercial agencies, was of any considerable importance.

The office had made its plans for a proper presentation of the cases of these recalcitrants to the United States courts in the several states, in order that the proceedings contemplated by the census act might be taken against them; but as the canvass progressed and one after another of the great manufacturing establishments which had at first declined to report submitted their schedules, it was found that the list remaining was not of sufficient consequence to justify the office in entering upon any litigation for the purpose of enforcing the penalties of the law.

The main question involved in these refusals to answer, and the one raised by most of the recalcitrants, therefore, remains undetermined. That question involves the constitutional right of the Congress of the United States to exact this information from citizens. It may be said, however, in closing the discussion of this subject, that the practice of the Government in exacting this information in substantially the same form at every decade (with one exception) for a period of nearly a century, together with the well-nigh universal acquiescence of manufacturers in the right of Congress to call for such returns, is practically a recognition of that right, and is likely to have great weight in determining future judicial decisions.

XII.

THE SCOPE OF THE CENSUS OF MANUFACTURES.

From the first census of manufactures, taken in 1810, down to the census of 1900, the proper scope of such a census has been one of the most difficult and important problems the office has been obliged to solve. The attempt has been made to report all branches of "productive industry" under the heads "manufactures," "fishing,"[1] "mining," and "agriculture," but the practice of the office in fixing the dividing lines between these industries shows many variations.

1. *Relation of Manufacturing to Agriculture.*—Theoretically, manufacturing includes all industries which use raw materials, as opposed to agriculture, which either extracts raw materials directly from nature, or assists natural forces in the production of such materials, without using any raw materials in the strict sense of that term. A practical difficulty arises, however, as soon as an attempt is made to apply this distinction. There are numerous operations connected with the handling of raw materials, and essential to their preparation for the market, which advance them only slightly beyond the raw state, but which, nevertheless, involve labor that is theoretically independent of the labor employed in their production. Although these are strictly manufacturing operations, they are often performed upon the farm, and are so intimately connected with agriculture that they continue to be regarded as integral parts of that industry. The ginning of cotton may be given as an illustration. At the census of 1880 an effort was made by Mr. Edward Atkinson, the special agent in charge of the cotton manufacture, to take a census of all ginneries in the South, but "it wholly failed."[2] Similarly, in the case of the present census, an effort was made to include plantation gins, as well as public gins, in the general statistics of manufactures. A later investigation was made, however, for a special report, in which the inquiries were restricted to the quantity of cotton ginned. By means of the later canvass, which covered practically all gins in the country, it was shown that a very large number of the plantation gins had been omitted in the general canvass.

This experience demonstrates the futility of attempting to include farm manufactures in the regular manufacturing statistics. In the first place, there is an almost entire absence of accounts of any sort relative to capital, wages, materials, etc.; and secondly, even where such figures are obtainable with approximate accuracy, it is practically impossible for the farmer or the enumerator who makes the canvass to assign the proper share to the manufacturing operations.

For these reasons it has been the general practice of the office at recent censuses to treat such "borderland" operations as agricultural when they are carried on on the farm, and as manufacturing when they are carried on away from the farm. At the present census this distinction has been applied more or less exactly to the manufacture of butter, cheese, wine, cider, vinegar, raisins, olive oil, dried and evaporated fruits, sugar and sorghum, and to the slaughtering of cattle and the felling of trees.

[1] Statistics of fishing were not collected in 1900.
[2] Letter dated June 12, 1901, from Edward Atkinson to The Manufacturers' Record.

One of the most important services which the census renders to economic science is the clue it supplies to the changes constantly occurring in the methods of handling agricultural products. An increasing number of essentially manufacturing operations, which were formerly carried on exclusively on the farm, are now passing from the farm to the factory, a change of method precisely similar to that which at the beginning of the Nineteenth century withdrew the manufacture of woolen, flax, and cotton goods from the farm and the household, and gradually established these industries in factories. The practice of reporting the same operation under agriculture or manufactures, according as it is a farm or a factory industry, makes it possible to measure this movement statistically.

The butter and cheese industry may be given as an illustration of the fact just noted. These products belong more distinctively to the farm and are more intimately connected with its domestic economy than almost any other that can be named. And yet with the lapse of time this great industry is being drawn away from the farm and concentrated more and more in the factory. The movement began earlier and has been more marked in the case of cheese than in the case of butter. The censuses of 1860 and 1870 showed a great decline between those years in cheese produced on the farm. The decline was due to the rise of the factory industry, which had been insignificant in 1860, but which in 1870 reported a production of 109,435,229 pounds, more than double the farm production of cheese for that year. In 1900 the factory production, as shown in the statistics of manufactures, had risen to 281,972,324 pounds, or more than seventeen times the production on farms for the year as reported in the statistics of agriculture. The factory production of butter did not become of sufficient importance to be included in the statistics of manufactures until 1880. Even then the amount reported under manufactures was only 16,471,163 pounds, while the farm production was more than forty times that amount. Since 1870 both farm and factory production have increased, but the increase in factory production has been so much more rapid than that of the farm that in 1900 it constituted nearly one-third of the total.

This gradual gravitation of the making of dairy products from the farm to the factory is an evolution which had its origin in Switzerland, where the methods of farming are fundamentally dependent upon the village organization of the farm society. The settlement of farmers in villages naturally resulted in the formation of unions for making butter and cheese. This cooperation brought about economy of labor and insured a more uniform and satisfactory product. A large number of these butter and cheese factories are managed on the cooperative plan, and are owned and operated by the farmers of the vicinage. Closely connected with agriculture as they thus continue to be, they nevertheless represent a process quite as distinctly a manufacturing industry as is the production of cloth or steel.

Lumbering, namely, the felling of trees (except for firewood), is treated as a manufacturing industry on account of the very general removal of this operation from the farm. The division of agriculture, however, reports a large value for timber cut on the farm, chiefly for firewood.

Illustrations of a similar character run all through the work of the two divisions. Large quantities of wine are made on farms and are included in the Report on Agriculture; but the division of manufactures also reports the production of wine in so far as this is a factory industry. The factory product in 1900 constituted more than two-thirds of the total production. The farm manufacture of sugar and sorghum, while still of considerable importance when regarded by itself, has ceased to be of much importance in comparison with the production carried on in organized manufacturing establishments.

Similarly, cotton ginning has moved from the farm to the factory. The failure to get manufacturing returns for the industry in 1880 was due to the fact that so large a proportion of the gins were then located on plantations. Since that time the number of farm cotton gins has been steadily decreasing, yielding the field to large public ginneries with mechanical appliances for handling the fiber rapidly and to the best advantage.

These illustrations reveal the increasing number of points at which the two branches of census work run into each other. It has been the aim of the chief statisticians in charge of these branches of inquiry at the Twelfth Census to present the results of their work so as to indicate, wherever possible, this growing interdependence of the two industries.

At many points the results of one inquiry have tended to confirm and to corroborate the results of the other in a manner most striking and gratifying. For example, the division of agriculture reported the production of 658,534,252 bushels of wheat during the crop year 1899. The division of manufactures reported the utilization of 489,914,004 bushels of wheat in the production of flour during the year ending June 1, 1900. There were 101,950,389 bushels of unground wheat exported during the fiscal year ending June 30, 1900. The wheat reserved by the farmers for seed is usually estimated as 1.4 bushels per acre. This, for the 52,588,574 acres reported in 1899, was 73,624,004 bushels. During the year ending June 1, 1900, the visible supply of wheat, according to the annual report of the Cincinnati Board of Trade, increased from 24,192,000 bushels to 44,755,000 bushels, a gain of 20,563,000 bushels. Adding the wheat reduced to flour by the mills, that exported unground, that retained

by the farmers as seed, and this addition to the visible supply gives a total of 685,051,397 bushels. If this total is compared with the 658,534,252 bushels reported by the farmers to the division of agriculture, it is found that there is an excess over that reported production of 26,513,145 bushels, or a little more than 4 per cent. This excess may arise from a failure on the part of the enumerator to report all the wheat produced. It may be due to a change in the visible supply of wheat in the hands of the farmers and small elevators. It may also be due to a variation in the year for which the manufacturers make up their reports. It probably represents a combination of the results of all these factors. The fact that the period covered by the fiscal year of the Treasury Department in its report of exports does not exactly correspond with the census year, and that neither exactly agrees with the twelve months in which the crop of 1899 was harvested and marketed, affects the foregoing comparison to but a trifling extent.

The statistics of cotton ginned in the census year, as returned to the division of manufactures in the special inquiry upon that subject, are strikingly consistent with the statistics of cotton produced, as returned to the division of agriculture; and the statistics of wool consumed in the woolen mills of the country are found to accord with the agricultural statistics of the wool production.

2. *Relation of Manufacturing to Mining.*—The difficulties involved in defining the proper scope of a manufacturing census appear again in the close relation of the mineral industries to manufacturing. The smelting and refining of ores is essentially a manufacturing operation. But in the earlier stages of the development of the country's resources of base and precious metals, particularly in the Rocky Mountain region, the absence of railroads and the high cost of transportation made it necessary to refine the ores in the neighborhood of the mines. The mining of ores and the subsequent working of them were, therefore, frequently carried on by the same individual, firm, or corporation, and it was difficult to ascertain the amount of capital invested in each branch, or to make a satisfactory division of the aggregate labor of the establishment between the two processes, or to estimate the value of the ore when charged into the smelter. On account of these difficulties the statistics of mining were combined with the statistics of smelting and refining of ores at all censuses, except that of 1870, down to the census of 1900. At the census of 1870 and again in 1900 a separation was made and the treatment of the ores after their delivery from the mines was classed as manufacturing. This separation, though still difficult, has become easier than it was at earlier censuses, as a result of the separation in many cases of these manufacturing operations from the mines.

The statistics for mines, mining, and ore dressing will be presented in subsequent reports, to be published in conformity with section 8 of the act of Congress of March 3, 1899, providing for taking the Twelfth Census, and section 7 of the act of March 6, 1902, providing for a permanent Census Office. That this provision was a mistake has been demonstrated repeatedly during the progress of the work. In all cases where the processes of smelting and refining of ores are still carried on by mining corporations the difficulty of making a true separation between the two processes is greatly increased by taking the two censuses at different times. It is clear that under the circumstances indicated above future censuses of the mineral industries, in order to be complete and satisfactory, must be taken simultaneously with the censuses of manufactures. In this manner all data relating to both industries may be gathered at the same time by the same agents, and the proper separation accomplished. This course is rendered necessary also in order that the presentation of the industrial activities of the country, as made by the census, may be complete. The mineral industries, even the mining of coal, are all processes incident and preliminary to manufacturing, and should be treated in accordance with a uniform plan, representing, as they do, closely interwoven parts of one whole.

The same difficulty appears in the case of stone quarrying. A large number of quarries now finish and market their own products. It was found impossible to secure a separation between the items chargeable to the quarrying of stone, and those relating to the finishing of this stone for building, monumental, or ornamental purposes. The industry was therefore treated by the Census Office as a branch of manufacturing, in cases where quarrying establishments prepare the stone for the market, and as a branch of mining when they are simply engaged in extracting stone to be sold in the rough. There will therefore be a comparatively small number of quarries included in the mining census about to be taken. Such results are very unsatisfactory, and demonstrate that the industry would be shown to best advantage if taken as belonging solely to one or the other great division of industry, manufacturing or mining.

Among the defects of previous censuses has been their failure to show what proportion of the total value of the manufactured products reported was directly attributable to agriculture, mining, and the fishing industry, respectively. Such an analysis of the returns for manufactures is made possible by the methods adopted at the Twelfth Census; namely, the grouping of materials used in manufacture into two classes, those used in a raw state, and those used in a partially manufactured form. The results obtained by this means are discussed on page cxxxv.

3. *Distinction Between Manufactures and Hand Trades.*—The determination of the proper scope of a census of manufactures is still further complicated by

the close relation which exists between manufacturing, as the word is ordinarily understood, and the various so-called hand trades, carpentry, tailoring, custom boot and shoe making, etc.

The inclusion of these hand trades in the census of manufactures has been due to a requirement found in all census acts that returns shall be collected from all "manufacturing and mechanical establishments." The latter half of the phrase is very indefinite and its proper interpretation and limitation have always been a source of perplexity. Practically, however, it has been taken to include the hand trades, in contradistinction to the factory industries. Although these two classes of industries are essentially different, their statistics have never been presented separately until the present census.

The tables of industries are now so presented that the student can consider the whole body of statistics if he pleases, or he can consider the statistics of manufactures proper as distinct from the hand trades, or he can consider the latter statistics by themselves, and also in their relation to the whole. This segregation is indispensable if erroneous deductions and conclusions from the census statistics are to be avoided. No fair estimate of the condition of the wage-earners of the country can be made from general tables in which are included, not only the great manufacturing concerns, which employ thousands of operatives, but also the small shops in which, as a rule, the proprietor does all the work, or works with only the aid of one or two assistants.

4. *Meaning of the Word "Manufacture."*—The separation of the two classes of operations was accomplished, however, with considerable difficulty, for there is a large number of operations which it is difficult to assign to one or the other category. That this difficulty is fundamental is evident from the fact that economists have not come to any exact agreement as to the meaning of the words "factory" and "manufacturing."[1]

These two words have a common origin etymologically, factory being merely an abbreviation of "manufactory," and no valuable end is attained by separating them now. Manufacturing industries are, therefore, to be regarded as identical with factory industries.

Four bases of distinction between manufacturing and the hand trades have been suggested by various writers, namely, the use of power, the use of machinery, production for the general market, and production under a system of division of labor. All of these are undoubtedly characteristics which are usually associated with manufacturing, but no one of them alone sufficiently defines the word. Manufacturing, for example, includes all power industries, but it also includes many others. A distinction based on the use of power would exclude nearly one quarter of the jewelry factories reported in 1900, since 225, out of a total of 908, used no power. For the same reason, it would exclude a large number of establishments engaged in the manufacture of knit goods, using hand machinery only. Fifteen of these establishments were of considerable size, giving employment in every case to more than 25 wage-earners, and in one instance to 140 wage-earners.

Some writers have endeavored to meet this objection by making the use of machinery the basis of their distinction instead of the use of power. This, however, is too broad a definition, for it makes the street scissors grinder a manufacturer.

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[1] *The word "manufacture."*—This word is nearly 400 years old, having been coined in France in the Sixteenth century by combining two Latin words which mean, taken together, "to make by hand." The word was given this meaning in a French dictionary published in 1611, and was used in English, by Bacon, in this sense in 1621. It is interesting to trace the change in the meaning of the word by comparing the definitions given in dictionaries issued at various dates. Three periods may be distinguished:

(1) 1621 to 1754, during which period the meaning is limited to hand work.

(2) 1755 to 1802, during which period a broad, general meaning (evidently allowing machine work as well as hand work, but not using the words "machine" or "machinery") exists side by side with the exclusively hand-work meaning. This latter disappears at the end of the period.

(3) 1803 to 1898, during which period only the broad, general meaning is used.

Both hand and machine work are evidently allowed in the early years of this last period, but the words "machine" and "machinery" do not appear in the definition until 1830. This was, however, in an American dictionary (Webster's). The first use of these words which has been noted in the definitions given in English dictionaries was in 1846.

The change in the meaning of the word is thus shown to bear a close relation to the changes in the methods of production. The use of crude hand and foot machinery had attained considerable proportions in England by 1755, and the result is seen in the broader definition which appeared first in that year. But it remained for the application of steam power to manufactures, after 1770, to cause the final displacement of the exclusively hand-work definition in 1802, just as it led up to the passage of the first English factory act in that year.

There are several official definitions of the word "manufacture" which may be appropriately reproduced here. According to the English factory act of 1867 (30 and 31 Victoria, 103), "any manual labor exercised by way of trade or for purpose of gain in or incidental to the making of any article, or in or incidental to the altering, repairing, finishing, or otherwise adapting for sale any article, constitutes a manufacturing process." This is a very broad definition. On the other hand, the United States Supreme Court, in Hartranft *v.* Weigmann (121 U. S., page 609, 1886), has given the word "as used in the tariff laws" a much narrower meaning. The court held that shells that had been washed, cleaned, and polished by the use of acids and the emery wheel and buffer were not manufactured shells under the tariff law. "They were still shells. They had not been manufactured into a new and different article, having a distinctive name, character, or use from that of a shell. The application of labor to an article, either by hand or by mechanism, does not make the article necessarily a manufactured article, within the meaning of that term as used in the tariff laws. Washing and scouring wool does not make the resulting wool a manufacture of wool. Cleaning and ginning cotton does not make the resulting cotton a manufacture of cotton. In Lawrence *v.* Allen (48 U. S., page 785) it was held that an india-rubber shoe made in Brazil by simply allowing the sap of the india-rubber tree to harden upon a mold was a manufactured article, because it was capable of use in that shape as a shoe and had been put into a new form capable of use and designed to be used in such form."

The definition of a "factory" given by Carroll D. Wright in the Tenth Census (Manufactures, folio 533) is as follows: "A factory is an establishment where several workmen are collected for the purpose of obtaining greater and cheaper conveniences for labor than they could procure individually at their homes; for producing results by their combined efforts which they could not accomplish separately, and for preventing the loss occasioned by carrying articles from place to place during the several processes necessary to complete their manufacture. The principle of a factory is that each laborer, working separately, is controlled by some associating principle which directs his producing powers to effect a common result, which it is the object of all collectively to attain."

Production for the general market is a better standard, but it fails by including too little. Planing mills, brickyards, and bakers' shops show a distribution which is in general proportional to the local population, indicating what is known to be the fact about these industries, that their production is chiefly for local consumption. Two of these operations, however, the making of sash, doors, and blinds in planing mills, and the making of bricks in brickyards, must surely be included as manufacturing industries.

Economists, notably Karl Marx and Karl Bücher, emphasize the division of labor as the distinctive feature of factory work. This is, however, an unsatisfactory standard for practical purposes. A crude division of labor arises in a small way whenever two men assist each other in any productive process and the distinction between this and the division of labor in a large factory is little more than one of degree. On the other hand, the operation of small saw and grist mills and small cotton gins, etc., must be regarded as manufacturing industries, even though but one man is needed to operate them, a division of labor being thus put out of the question.

5. *Standardization the True Test.*—The true criterion for manufactures, as opposed to the hand trades, is found in the standardization of the process. This latter word, however, requires some definition. It describes all operations which produce "standard" products; that is, similar products which conform to a general demand. Tailoring and custom shoemaking, for example, are not standardized, for dissimilar articles are produced, each being suited to the taste and need of the individual consumer. But the manufacture of ready-made clothing and shoes is standardized, for here the products all conform to a single standard, even the variations for sizes being standard variations. In the hand trades there can be no standardization, for these operations are all custom work; that is, work upon order from the customer. The manufacturer, however, produces for a general demand which is so strong, so well established, and so uniform that a standardized work is made possible.

The standardization of processes has extended far beyond single establishments, especially in this country, and has made possible the system of interchangeable mechanism spoken of later in this report.

A limitation must be recognized, however, to the general application of the distinction just explained. Standardized work is essentially work "for the market," as opposed to the hand trades, where the work is upon the consumer's order. There are, however, a few industries, such as shipbuilding and pipe-organ building, where the standardization of the process has been applied only to the smaller and less expensive products. The reason is plain, however, in these exceptional cases, and does not affect the validity of the distinction in general. The demand is comparatively so small for these expensive products, and the variations are so great in the taste and needs of the consumers, that standardization has not yet been applied to their manufacture. Large ships, built upon order, are, nevertheless, as properly regarded as manufactured products as the small boats, built in quantities and put upon the market.

The desire on the part of many consumers to have products of special designs and styles has caused a differentiation in many industries, which follows almost exactly the line of distinction explained above between manufactures and hand trades. This tendency is best shown in the manufacture of carriages and wagons, where the manufacture of the parts, wheels, bodies, tops, etc., has been standardized, and is, therefore, a factory industry, while the assembling of these parts, which is done in smaller shops at the point of consumption to suit the taste of the purchaser, is an operation which must be regarded as a hand trade. In other industries, such as the pipe-organ manufacture, this differentiation has not taken place to any great extent, the manufacture of the standardized parts and the assembling of the same being both carried on by the same concern. Similarly, there are clothing factories which put suits together in response to mail orders giving individual measurements.

If this distinction is applied to the various troublesome illustrations given above, it is found that each is readily classified. Handmade jewelry and hand knit goods are made by standardized processes and are, therefore, manufactures. The street scissors grinder's operations vary continually with the various objects given him to mend. He produces no standard product and is, therefore, a hand tradesman. Planing mills, brickyards, and bakers' shops all place their standard products upon the market, and are, therefore, factories.

The building trades in reality constitute a class by themselves, though for convenience they are included in this report under the expression "hand trades." They have much in common with factory industries. In the erection of a modern city building more power is used than in many forms of manufacturing. A very decided division of labor exists, and in so far as a builder erects a number of houses upon the same plans and offers them for sale, there is the beginning of a standardized process. On the other hand, the building trades, like the hand trades, produce for local consumption. Finally, the building trades have a characteristic common to neither of the above. They have no definite location. The producers of buildings go to the point of consumption and create there a practically immovable product, while all other producers work in an establishment from which products are sent out to more or less distant consumers. Apart from the theory of the case, however, it is plain that the building trades have no place under the head of manufactures proper.

6. *The Hand Trades.*—The industries classed as hand trades at the present census are as follows:

Bicycle and tricycle repairing.
Blacksmithing and wheelwrighting.
Boots and shoes, custom work and repairing.
Clothing, men's, custom work and repairing.
Clothing, women's, dressmaking.
Dyeing and cleaning.
Furniture, cabinetmaking, repairing, and upholstering.
Lock and gun smithing.
Millinery, custom work.
Sewing machine repairing.
Taxidermy.
Typewriter repairing.
Watch, clock, and jewelry repairing.

BUILDING TRADES.

Carpentering.
Masonry, brick and stone.
Painting, house, sign, etc.
Paper hanging.
Plastering and stuccowork.
Plumbing, and gas and steam fitting.

This selection was made with considerable difficulty and must be regarded as tentative only. The following is a list of the industries of a doubtful character which have been classed as manufactures rather than as hand trades:

Artificial feathers and flowers.
Awnings, tents, and sails.
Bookbinding and blank book making.
Bottling.
Bread and other bakery products.
China decorating.
Confectionery.
Cordials and sirups.
Engraving and diesinking.
Engraving, wood.
Fancy articles, not elsewhere specified.
Flags and banners.
Hairwork.
Hand stamps.
Lapidary work.
Marble and stone work.
Millinery and lace goods.
Mineral and soda waters.
Monuments and tombstones.
Photography.
Regalia and society banners and emblems.
Roofing and roofing materials.
Saddlery and harness.
Tinsmithing, coppersmithing, and sheet-iron working

Although this list is much larger than the list of industries classed as hand trades, it represents but 69,949 establishments, while the hand trades include 215,814 establishments. It will be seen, therefore, that the most important of the hand trades have been included in the class so named.

Of the 355,415 schedules tabulated at the Eleventh Census, 139,134, or over one-third of the total number, were included in the 19 industries which have been classed as hand trades at the present census, and it is fair to assume that a proportionate share of the total cost of the field work of that census is attributable to this group of schedules. Nevertheless, the total value of gross products returned upon this group of schedules was only $1,183,615,478, or about one-eighth of the total gross value of products returned at the census of 1890.

At the census of 1900, 343,233 schedules out of the total of 640,194 returned, including 127,419 returned from establishments having a product of less than $500, were included in these industries, leaving but 296,961 schedules which represented the factory industry. Yet this latter number, representing but 46.4 per cent of the whole, returned a gross product valued at $11,875,022,028 out of the total of $13,088,422,149, or 90.7 per cent of the total value of products.

7. *Cost of the Hand Trade Canvass.*—The cost of collecting returns for the hand trades was about the same per schedule as for manufactures proper. This would not, perhaps, be a legitimate objection to a hand-trade census, if it were possible to make an approximately accurate enumeration of these industries. There are many reasons, however, why this is impossible, and must always remain impossible. Most of the hand trades are merely a remnant of the household type of industry, which was once all inclusive, but which has now given way very generally to the factory system.

The inclusion of these trades in all early censuses of manufactures had a justification which is very apparent. When the first census of manufactures was taken, in 1810, manufactures had hardly begun to move from the household to the factory. Very much the larger proportion of the industries reported in that year was carried on in the homes of the people in addition to their regular occupations, agricultural and manufacturing pursuits being closely blended. The same was true of the census of 1820, and, to a lesser degree, of the census of 1840.[1] In his famous speech of February 2, 1832, Henry Clay gives an enumeration of the industries which were then carried on by the mechanic class, either in their own homes or in little shops, where they worked alone or with one or more apprentices. Speaking of manufacturing of this sort, Mr. Clay said:

> It extends to almost every mechanic art—to tanners, cordwainers, tailors, cabinetmakers, hatters, tinners, brass workers, clock makers, coach makers, tallow chandlers, trace makers, rope makers, cork cutters, tobacconists, whip makers, paper makers, umbrella makers, glass blowers, stocking weavers, butter makers, saddle and harness makers, cutlers, brush makers, bookbinders, dairymen, milk farmers, blacksmiths, type founders, musical-instrument makers, basket makers, milliners, potters, chocolate makers, floorcloth makers, bonnet makers, haircloth makers, coppersmiths, pencil makers, bellows makers, pocketbook makers, card makers, mustard makers, lumber sawyers, saw makers, scale-beam makers, scythe makers, wood-saw makers, and many others.[2]

Of the industries above enumerated, all of them hand industries at the time, and supplying the local demand in every neigborhood, there are but very few

[1] Manufacturing statistics were omitted from the census of 1830.
[2] The Life and Times of Henry Clay, by Calvin Colton.

which have not in the interval passed completely into the factory system. The production of single articles, handmade in every particular, has given way to the factory production of a large number of articles identical in their entireties as well as in their parts, for the supply of large areas of country. Only those household industries remain to which, for inherent reasons, the factory system can not adapt itself, or which are required to meet the everyday wants of a community. These are the operations of the blacksmiths, who no longer make the horseshoes; the carpenters, who no longer fashion the doors, the windows, the sills, or the other parts of a house which can be more advantageously made in the planing mill; the painters; the bricklayers; the plumbers; the paper hangers; and the workers at other trades where the hand must still supplement the work of the machine by fitting and adapting its products. In a word, the conditions which led Congress in 1810, 1840, and 1850 to think that a census of the hand trades was essential to a knowledge of the productive wealth of the country have so completely changed that such a census is no longer needed for that purpose.[1] Congress, however, in enacting successive census laws has failed to take cognizance of these changed conditions.

8. *The Difficulties of a Hand-trade Canvass.*—The difficulties in the way of an accurate census of these hand trades are inherent in their character. Repair shops constitute a large proportion of the establishments in the 19 industries classed as hand trades, and these are usually located in establishments which are also engaged in retail trade. The repair departments of jewelry and hardware stores are illustrations. Under the instructions received, agents and enumerators were expected to obtain returns for such repair work. But they were necessarily instructed to make return only for such proportion of the capital invested, wages paid, etc., as related exclusively to the repair department. The difficulty, and indeed the absurdity, of attempting such a separation of these items, in the great majority of cases, is apparent. The proprietor of a small establishment of this description keeps no separate books which will enable him to make such a segregation; and the result is, necessarily, that nearly every such return obtained is little more than an arbitrary estimate made by the agent or enumerator, and has little value for statistical purposes.

[1] Gen. Francis A. Walker stated in the Atlantic Monthly for 1869, page 689, that the contribution to the wealth of the country by its artisans or hand workers was then far more valuable than that made by its factory workers. If this was true at so recent a date as 1869, the change since that time has been tremendous. On the basis of gross value of products, the work of the hand-trade artisans in 1900 appears to have had a value of $1 for every $13 of the whole value of products. Even if it is assumed that the hand-trade canvass was defective and did not show one-half or one-quarter of the total value of the product of these industries, and such a deficiency may easily exist, the fact remains that the value of the factory products of the country is now vastly in excess of the value of all hand-trade work.

Again, the majority of persons engaged in the hand trades carry on their business in a single room. Since this room is not usually owned, no value is reported for land or buildings, and the entire capital consists of tools and a small quantity of material and cash. The value of products, which seldom represents the value of the finished article, being only the materials and labor incidental to repair work, is out of proportion to the capital invested and wages paid. Under these conditions the reports are not in harmony with the reports for manufacturing plants, and their combination with the reports for such plants, has a tendency to destroy the statistical value of both.

As mercantile business develops, it takes on more and more the functions and characteristics of the various hand trades. There are very few large stores in our cities which do not conduct one or more industries, such as dressmaking, cloakmaking, and millinery, connected with their mercantile business. From some of the department stores the agents of the census secured ten and even twenty separate reports for as many separate trades, which were being conducted as auxiliary to the mercantile business of the store. This illustrates only one of the many perplexities which surround the whole work of the census in this connection.

The Eleventh Census undertook to secure returns from dentists regarding the manufacturing part of their work. Returns from 3,214 such establishments were included in the reports; but the office was finally compelled to abandon the attempt, so pronounced was the objection of the dentists themselves. They insisted that their work was professional and not mechanical; and again, that in so far as it was mechanical, it was so closely related to the professional that the attempt of the office to secure a report from which the purely professional part should be excluded was ridiculous. Undoubtedly the dentists were right in their contention.

Owing to the close relation between the hand trades and retail business, agents and enumerators were specially instructed in 1900 not to secure reports for restaurants and saloons; for undertaking or funeral directing; for retail druggists; for retail butchers; for laundries, barber shops, or junk shops; for excavating or well digging; ice harvesting; salting hides; bill posting; carpet cleaning; for dentistry or other professional services; for dressmakers, milliners, or seamstresses who work at their homes; for journeymen who work for hire; or for any person who has no shop or regular place of business. Practically the same instructions were given at the census of 1890.

Notwithstanding these explicit instructions, many agents at the present census apparently misconstrued or neglected them, while others evidently concluded that, although reports were to be secured for the hand trades, the canvass was to be confined to the more important shops and contractors. The constant change

in the ownership and location of the shops where these trades are carried on makes it impracticable to prepare a list of them for the guidance of the agents, especially in the large cities. The office was, therefore, obliged in a majority of cases to trust entirely to the special agents and enumerators, and unless a glaring error appeared in the number of schedules secured, their work was accepted as final. The inclusion of reports for these industries has added largely to the cost of the canvass and greatly delayed the completion of the work.

At certain of the earlier censuses, 1840, 1850, 1860, and 1870, agents were instructed to take no establishment whose product was less than $500 per annum, as required by law. (See footnote, page xviii.) Instructions of this character were not given at the census of 1890, but no schedules were tabulated which showed a product of less than $500. At the census of 1900 all schedules of this character were tabulated; 127,419 such schedules, or nearly one-fifth of the total number of all kinds, were received. In order, however, to maintain the basis of comparison between the two censuses, the tabulation of these latter schedules has been presented separately. The total value of the products returned on these schedules was $29,784,643. The main purpose of securing the schedules was to avoid the following criticism made by Superintendent Walker upon the census of 1860:

> The restriction was one which was not nor could be honestly observed. Such a limitation served in 1860, and would always so serve, as a wholesale excuse to all minor establishments whose production might reasonably be anywhere in the neighborhood of $500, whenever the proprietor preferred, for any reason, not to be enumerated, or the assistant marshal reckoned the trouble of a visit at something higher than the 15 cents which the law allowed him for the service.[1]

The census of 1900 established the arbitrary rule that no hand trades were to be canvassed which were not carried on in a shop of some character, the existence of which should be the guide for the enumerator or special agent in determining where he was expected to obtain a schedule. The necessity for some such rule is obvious. But its establishment arbitrarily threw out of the census returns the statistics for a large body of artisans who work at their homes, or without a shop. Their product may indeed have been small in comparison with the total product reported, but it ought, nevertheless, to be counted, if the purpose of the census is to present an approximately accurate statement of the amount of wealth added to the country in the census year through the instrumentality of the hand trades. The extent of the omissions thus caused may be seen by comparing the number of persons included in certain of the occupation tables shown in the statistics of population with the number of persons employed in the corresponding industries, as reported in the census of manufactures.

General Walker has shown that in the hand trades the figures given in the occupation tables should show an excess of about 16 per cent over the corresponding figures in manufacturing tables. The figures of 1870,[2] however, show the following discrepancies:

TABLE III.—*Blacksmiths, wheelwrights, and masons, 1870.*

INDUSTRY.	Occupation tables.	Manufacturing tables.	Excess of former.	Per cent of excess.
Blacksmiths and wheelwrights.	162,716	59,971	102,745	171.3
Masons and stonecutters	115,541	16,762	98,779	589.3

Similar discrepancies appear in the statistics for 1900, though they have been very much reduced by the greater thoroughness of the canvass. These are as follows:

TABLE IV.—*Blacksmiths, wheelwrights, and masons, 1900.*

INDUSTRY.	Occupation tables.	Manufacturing tables.	Excess of former.	Per cent of excess.
Blacksmiths and wheelwrights.	240,615	36,193	204,422	564.8
Masons, brick and stone	161,048	85,826	75,222	87.6

The discrepancies of the hand-trade canvass are even more strikingly shown in Part III of this discussion, where the statistics of these trades in the cities are given.

9. *Conclusions Regarding a Hand-trade Canvass.*—The conclusions reached regarding a census of the hand trades may be summarized as follows:

I. The inclusion of the reports of the hand trades in the census of 1900 increased the number of establishments reported for the United States by 215,814.

II. The expense of collecting and compiling the statistics for these trades is as much per schedule as the collection and compilation of the reports for the average manufacturing establishment.

III. The reports for these trades have not been collected on uniform lines at the several censuses. Some trades included at one census have been omitted at subsequent censuses, while the subsequent censuses have in some instances included trades which had formerly been omitted.

IV. It is impossible to make a hand-trade canvass of the entire United States on uniform lines. The lack of such uniformity in the different states and cities results in a false showing of the relative importance of the hand trades in the different localities.

V. The arbitrary line of demarcation in the size of the establishments reported at this and preceding censuses—viz, an annual product of $500 or over—has resulted in excluding from the census reports the returns from a large number of small shops engaged in these trades.

VI. The persons engaged in these trades can not be considered as in any sense engaged in manufacturing, and therefore the inclusion of statistics relating to

[1] The Atlantic Monthly, 1869, page 689.

[2] Ninth Census of the United States, 1870; Industry and Wealth, page 801.

their occupations in tables presenting the figures for manufactures destroys the statistical value of the tables.

VII. In many cases persons acting as independent contractors, or operating shops during a part of the year, work as journeymen for hire during the remainder of the year. In such cases persons who were working for hire at the time they were visited by the enumerators would not be reported as independent operators, and to that extent the enumeration would be defective.

In view of the demonstrated inaccuracy of a hand-trade census, and the impossibility of making it otherwise than inaccurate; in view, moreover, of the great cost which such a census involves, the chief statistician strongly recommends the abandonment of all inquiries of this character at future censuses. This would require, however, a change in the wording of the act establishing the permanent Census Office. This recommendation is in accord with the judgment of Gen. Francis A. Walker,[1] Superintendent of the Ninth and Tenth censuses; Robert P. Porter, Superintendent of the Eleventh Census; and Carroll D. Wright, United States Commissioner of Labor, under whose superintendence the Eleventh Census was completed.

Congress has already anticipated this recommendation in the act providing for a permanent census, in so far as relates to the intermediate or five-year census of manufactures, which census is to be confined to factory manufactures, exclusive of the hand trades.

It will not be easy in all cases to draw a sharp line between manufactures and hand trades. As the development of industries proceeds, more and more of the hand trades are absorbed into the factory system, and many of these industries are still carried on by both methods. The distinction explained in the preceding paragraphs is, however, elastic enough to admit any hand trade into the ranks of manufactures as soon as it qualifies by standardizing its processes. At the middle of the nineteenth century, for example, there was a flourishing shoe industry in Lynn, Mass., and standard products, i. e., cases of shoes, were being shipped throughout the country. It had thus become a manufacturing industry by standardizing its processes. No power machinery had been introduced at the time, however, and, in fact, very little machinery of any kind. It would have been excluded from the category of manufactures, therefore, if the meaning of that word were made to rest upon the use of power.

There are two classifications of establishments included in this report which will be of assistance in making the division between hand trades and manufactures. These are the classifications according to the number of persons employed, and according to whether power is or is not used. The former classification, which is a modification of the classification adopted in the industrial census of Germany, is a novelty in American census statistics. Besides being valuable for the purpose of future comparison, as illustrating the growing tendency of our manufacturing industries to concentrate in large establishments, this classification makes it possible, if it shall be found desirable, to omit from the manufacturing statistics the statistics for all establishments with less than 5 persons, as is done in the manufacturing reports of the Massachusetts bureau of statistics of labor and the New York state department of labor.

The classification of establishments into "those using power" and "those not using power," although it does not show the exact line of demarcation between manufactures and the hand trades, is nevertheless practically valuable, because in a general way the introduction of power into a shop marks its evolution from the shop into the factory. With the growing cheapness of power, through new applications of electricity and small gas engines, members of the artisan class are more and more given to its use, and are thus rising into the rank of manufacturers.

[1] "Of the total amount paid or the collection of the statistics of manufactures in 'Schedule 4,' more than a fifth was expended for returns relating to carpentering, blacksmithing, coopering, painting, plastering, and plumbing, not one of which industries, though far better returned than ever before, was reported with sufficient completeness even to furnish the data for a computation of the true production of the trade; so that, after this expenditure, one is still obliged to resort to the tables of occupation for the material from which to estimate the production of this group of industries. The money thus thrown away would have served, if placed under the control of the Department of the Interior for the traveling expenses of special agents, to make the statistics of the larger industries complete and correct in the highest attainable degree, creditable to the census as a national work, an invaluable aid to the statesman, the political economist, and the practical man of business. At the same time a well-trained statistician can in a few hours, from the tables of occupation, reach a far more satisfactory result in respect to the products of the minor trades than is to be obtained by manipulating the partial returns of the trades themselves. In a word, the returns of manufactures should be restricted to those industries which are carried on in considerable establishments and are susceptible of a thorough, complete, and detailed enumeration.

"Second. The returns of manufactures, having been restricted, should be far more specific, and should be made to conform to the advance in the practical arts within the last twenty years, and to the requirements of modern statistical science. The additional facts thus to be elicited should not be industrial merely, but such also as are of social and sanitary importance.

"The manufacturing tables of the census ought to be so full of technical information as to become the handbook of manufacturers, while at the same time they might be made so pregnant with truths important to the economist and the statesman as to become a handbook of social and political philosophy. With no more authority of law than might have been contained in five lines of the statutes, and with not a dollar of expense above what has been incurred in making this unsatisfactory exhibit of the national industries, such an enumeration of the manufactures of the country might have been effected at the Ninth Census." Ninth Census, Industry and Wealth, page 384.

XIII.

THE IMPORTANCE OF COÖPERATION BETWEEN THE FEDERAL CENSUS OFFICE AND STATE STATISTICAL OFFICES.

By CARROLL D. WRIGHT, United States Commissioner of Labor.[2]

1. *Federal Statistical Offices.*—The importance of cooperation between the Federal and state governments in many statistical directions has become more and more apparent during the last ten or twenty years.

[2] I am greatly indebted for valuable data to Mr. William M. Steuart, chief of the division of manufactures, Twelfth Census.

This necessity is now emphasized in a very marked degree by the creation of the permanent Census Office. By the act of Congress, approved March 6, 1902, the census work of the Federal Government is to be carried on by a permanent office, properly equipped and under the charge of a director. This act takes effect July 1 of the present year. All the provisions of the act of March 3, 1899, providing for the Twelfth Census, not inconsistent with the act approved March 6, 1902, are to remain in full force and effect for the taking of the Thirteenth and subsequent censuses.

Section 7 of the act of March 6, 1902, authorizes the Director of the Census "decennially to collect statistics relating to special classes, including the insane, feeble-minded, deaf, dumb, and blind; to crime, pauperism, and benevolence, including prisoners, paupers, juvenile delinquents, and inmates of benevolent and reformatory institutions; to social statistics of cities; to public indebtedness, valuations, taxation, and expenditures; to religious bodies; to electric light and power, telephone, and telegraph businesses; to transportation by water, express business, and street railways; to mines, mining, quarries, and minerals, and the production and value thereof, including gold, in divisions of placer and vein, and silver mines, and the number of men employed, the average daily wages, average working time, and aggregate earnings in the various branches and aforesaid divisions of mining and quarrying industries until July 1, 1904."

Section 8 provides "that there shall be a collection of the statistics of the births and deaths in registration areas for the year 1902, and annually thereafter, the data for which shall be obtained only from and restricted to such registration records of such states and municipalities as in the discretion of the Director possess records affording sufficient data in necessary detail."

Section 9 provides "that in the year 1905, and every ten years thereafter, there shall be a collection of the statistics of manufactures, confined to manufacturing establishments conducted under what is known as the factory system, exclusive of the so-called neighborhood and mechanical industries."

From these provisions it will be seen that the permanent Census Office is to undertake the collection of statistics along very wide and expansive lines. Probably there is not a state in the Union that does not collect statistics relating to some of the subjects enumerated in the law establishing the permanent Census Office. Furthermore, several of the Federal offices devoted to the collection of statistics are engaged, under the laws relating to such offices, in the collection of data comprehended in some of these provisions relating to the Census Office. The question, therefore, becomes especially vital and important at this time as to how far the various features of the work provided for in the act of March 6, 1902, are to be duplicated by either Federal or state offices, and what coöperation can be established between Federal and state offices by which duplication shall be avoided, uniformity secured, and expense saved to both the Federal and state governments.

Every person, with perhaps one or two exceptions, who has considered the question of the establishment of a permanent census office, has emphatically indorsed the plan, and no statistician can be found who does not thoroughly believe that through its establishment there are to be secured not only statistics of a better quality, but also statistics thoroughly coördinated, because collected, classified, and published on uniform plans.

Of the various statistical bureaus of the Federal Government, seven only can be considered as offices conducting original research concerning subjects relative to the material advancement and condition of the country; the other statistical offices are engaged principally in compiling data concerning the transactions of the particular Department to which they are attached, in this work exercising their statistical genius in arranging suitable presentations of statistics gathered and compiled by their forces. Some of this work is more in the nature of bookkeeping than statistics. It is very apparent, when considering the organic and supplemental laws relating to the seven bureaus, that some of their work relates largely to identical subjects, and an examination of reports shows that there has been more or less duplication along the various lines. Every officer of the Federal Government aims to avoid such duplication, but in order to carry out the laws under which these seven bureaus conduct their operations, some duplication is unavoidable. This duplication in itself does not amount to so much as many imagine, and has some advantages. The chief difficulty is that the officers conducting these bureaus do not conduct their inquiries or make their compilations on uniform lines. Thus, widely divergent results on the same subjects oftentimes become confusing and misleading.

This is especially noticeable when the reports of the Federal census are compared with the reports of some other offices; as, for instance, when the Department of Agriculture reports that the wheat crop for the year 1900 amounted to 547,303,846 bushels, while the Census Office reported that it amounted to about 661,143,657 bushels. The reports of the Department of Agriculture are chiefly from the estimates made by local agents, one for each county, while the reports of the Census Office are made from the returns of the individual producers. The Census Office gave the cotton crop of 1900, as reported by cotton ginners, at 10,486,148 commercial bales; the Department of Agriculture estimated the probable production of 1900 at 10,100,000 commercial bales. There was not a very wide variation in this respect. During 1889 the Department of Agriculture published an estimate of the total values of the principal farm products, which amounted to $3,758,519,483, while the report of the Eleventh Census, which covered practically the same

year, gave the total values of such products at $2,460,107,454, exclusive of live stock. So, also, the reports of the Geological Survey are at variance with the census reports. These instances are sufficient to prove that there should be some harmony of action on the part of the Federal statistical offices taken by themselves. It is not the purpose of the writer at the present time to offer any criticisms of these variations or of the offices making different reports, but simply to call attention to them as an illustration of the necessity of either coöperative or coördinated work.

2. *State Statistical Offices.*—While the duplication of the work of the different bureaus of the Federal Government is minimized by their proximity and the conscientious effort of Federal officers to avoid such duplication, as already indicated, the same is not fully true of the work of the statistical bureaus and census offices of the different states in relation to Federal offices. Many of the state offices are now and have been for many years engaged in a straight duplication of the work of the Federal Government, a duplication which will be noticed more and more as the work of the permanent Census Office progresses. We have now in this country a great chain of state statistical offices known as such, the first having been created in the state of Massachusetts in 1869, when the bureau of statistics of labor was established. Since that year 32 other states have established like offices, and they have been engaged for a longer or shorter period in collecting industrial statistics and here and there statistics relating to other affairs of importance to the population of the several states. In addition to the publications of these offices especially created for statistical purposes, the state governments publish very many documents annually or biennially which include many of the features enumerated in sections 7, 8, and 9 of the law creating the permanent Census Office. All this great work, which has been made necessary by the wonderful advance of the country in economic directions and by the development of industrial and social movements, has now been crowned by the establishment of a permanent census office.

Thus, the mass of information published each year, and especially every ten years, has become so great that the student and the statesman find it difficult to study the details sufficiently to enable them correctly to interpret the results. The fact that the results are open to criticism need not be considered at the present time; but it is essential, as all will admit, not only that correct statistics should be published, but that they should be properly interpreted and systematically and conveniently presented for public use. This desirable result can be assured only by avoiding the duplication of work, by systematizing the methods under which statistics are gathered, and by a uniform codification of the results, to accomplish which it is necessary that there should be some system of coöperation between the state and Federal offices.

An examination of the laws of the different states shows that there are at least 38 states and territories in which offices of a distinctly statistical character exist, and that at least 27 of them have a constitutional or statutory provision for taking a more or less complete census. In many states there are special offices to collect statistics relative to special subjects, such as street railways, lighting plants, gas plants, steam railways, insurance, banking, taxation, valuation, crime and pauperism, and many other of the things enumerated in the law establishing the permanent United States Census Office; while, in addition to such provisions, the statutes of some of the states provide for the collection and publication of statistics by county commissioners and officers of other minor civil divisions. Logically, on the face of it, all this work, whether done by the Federal Government, or by states, counties, and cities, should be conducted on uniform lines and under coöperative methods. There has been some endeavor to recognize this necessity on the part of some of the states, which in their laws for state censuses have provided that the schedules and form of collection of facts adopted by the Federal Census shall be made applicable in such states. It would seem right and proper that provisions of this character should be incorporated in the laws of all the states and strictly adhered to. This would be one of the greatest benefits to statistical work that could be named.

A special feature, however, which now comes up under the establishment of the permanent Census Office is that relating to the canvass to be made in 1905 and every ten years thereafter of the statistics of manufacturing establishments conducted under the factory system. All the subjects coming under this particular head are covered or referred to in the reports of bureaus of many states. Here, especially, there should be uniformity in the schedules and inquiries propounded. Different offices should not cover the same ground. The published reports dealing with the same subjects should be uniform in their treatment, and the conclusions drawn by state officers should be from the same data as those used by the Federal Government.

When the state reports are studied in detail, it is found that during the past four or five years 8 states have published data dealing in some manner with the investigation into special classes, including the insane, feeble-minded, deaf, dumb, and blind; crime, pauperism, and benevolence, including prisoners, paupers, juvenile delinquents, and inmates of benevolent and reformatory institutions; that 14 states have published reports relating to public indebtedness, valuation, taxation, and expenditures; that 11 states have published reports in regard to religious bodies and social statistics of cities; that 6 states have published reports in regard to electric light and power; that 2 states have published reports relating to telephones; that 11 states have published reports relating to express business and street railways; and that 17 states have published

reports relative to mines, mining, and minerals. The offices in all these states are, to some extent at least, engaged in original statistical research, and obtain information directly from the people. There is evidently to-day, then, a very great degree of duplication of work, whereas coördination between Federal and state governments must result in a great economy of effort and a great increase in accuracy and completeness.

Thus, with the states engaged in the work they are doing and with the Federal Government devoted to statistical investigation through its various bureaus, there is a constant canvass of manufacturing and other establishments throughout the country. This very result, together with the expansion of statistical work, will sooner or later lead to an antagonism to statistical inquiry which will be fatal to its value. Manufacturers and others of whom data is sought do not object to a reasonable amount of annoyance or labor in order to comply with the requests of the Federal and state governments; but when they are visited three or four or more times a year by representatives of different offices asking for practically the same line of facts, the annoyance becomes so great that they resent the attitude of governments; and this resentment, once crystallized into coöperation, will defeat the very purpose for which statistical offices are created. The same person or establishment should not be approached too frequently by different officials for the same information or for slightly different information on the same general subject. The constant canvass of the same field may in some instances result in educating the people to furnish exact data, but experience has proved that the contrary effect is in general to be expected. Constant calls for information, where no remuneration is provided for furnishing it, result oftentimes not only in careless answers but in refusals to comply with requests.

While governments are constantly requesting manufacturers and others for information, the secretaries of trade associations, the editors of almanacs and yearbooks, and the compilers of encyclopedias and other works are also besieging them for specific information for their various works. These calls complicate the work of government offices.

In view of the fact that several state censuses will probably be taken in 1905, and that the law making permanent the Federal Census Office provides for a census of manufactures in that year, the Federal and state governments should therefore make the canvass at the same time, use the same schedules, and employ the same agents. Nor is there any great practical difficulty in carrying out such a method. The character of the inquiries to be propounded is placed at the discretion of the Director of the Federal Census, and like discretion is usually given to the state officials who are in charge of the state bureaus. Both the state and Federal officials, therefore, are in a position to deal with the subject from a practical point of view, and where further legislation on the part of the Congress and of the respective states is needed, it could probably be easily secured.

The great variations in the schedules used by different offices offer one of the best arguments for coöperation. As said above, like schedules should be used at the same time and by the same agents, whether the information is being sought by the Federal or the state governments. An examination of different schedules leads at once to the conclusion that in most instances it is impossible to coördinate the results secured. This is practically true in all economic investigations. The classification of wages, the definition of capital, the number of persons employed, what is included under the term "raw materials," what under "miscellaneous expenses," etc., should be clearly and uniformly stated, and uniform inquiries should be used by all statisticians. So in vital statistics there should be a uniform classification of the causes of death, and in all financial statistics only perfect uniformity can lead to scientific results.

3. *Conflicting Statistics.*—To carry us further into this matter of coöperation, it may be well to cite a few instances to show its great importance. The state of Massachusetts collects certain statistics of manufactures annually and also includes complete statistics of manufactures in its decennial state census. Thus its people are constantly being approached by government officials for information, while the Federal Census approaches the same parties decennially, and hereafter it will approach them quinquennially. So far as manufactures are concerned, the returns of the state of Massachusetts under state censuses and under Federal censuses show fairly uniform results, except that in 1880 the number of manufacturing establishments resulting from the Federal enumeration was widely disproportionate to the number shown by the state census five years later. The following table, showing the comparative statistics as reported to the state and Federal censuses at different dates, indicates the general uniformity of the two:

TABLE V.—MANUFACTURES: UNITED STATES CENSUS AND STATE CENSUS OF MASSACHUSETTS.

CENSUS.	Year.	Number of establishments.	Capital.	Number of wage-earners.	Wages.	Cost of materials.	Value of products.
United States	1880	14,352	$303,806,185	352,255	$128,315,362	$386,972,655	$631,135,284
Massachusetts	1885	23,481	500,694,377	379,328	147,415,316	389,757,458	674,634,269
United States	1890	26,928	630,032,341	447,270	205,844,337	478,199,434	888,160,403
Massachusetts	1895	26,265	516,082,557	430,310	192,970,059	461,254,353	849,807,302
United States	1900	29,180	828,264,287	497,448	228,240,442	552,717,955	1,035,198,989

*

If we consider the farms in the state of Massachusetts, we find different results. Through the state and Federal censuses, the state of Massachusetts, as already suggested, has had a quinquennial census. The number of farms and the total acreage in farms from 1870 to 1900 inclusive, are shown in the following table:

TABLE VI.—*Farms in Massachusetts.*

CENSUS YEAR.	Number of farms.	Total acreage in farms.
1870 (United States)	26,500	2,730,283
1875 (State)	44,549	3,402,368
1880 (United States)	38,406	3,359,079
1885 (State)	45,010	3,898,429
1890 (United States)	34,374	2,998,282
1895 (State)	65,287	3,847,749
1900 (United States)	37,715	3,147,064

The great variation in the number of farms strikes the student as unaccountable. For instance, there could hardly have been a difference of 18,000 farms between 1870 and 1875, or of over 30,000 farms between 1890 and 1895, in a state not known as an agricultural state. So the student must look deeper into the matter than the figures themselves. He will then find that in 1870 the term "farm," under the United States enumeration, included all considerable nurseries, orchards, and market gardens which were owned by separate parties and which were cultivated for pecuniary profit and employed as much as the labor of one able-bodied workman during the year. Mere cabbage and potato patches, family vegetable gardens, and ornamental lawns, not constituting a portion of a farm for general agricultural purposes, were excluded. No farm having less than 3 acres was reported, unless it produced $500 worth of product. The Federal Census Superintendent defined a farm as "what is owned or leased by one man and cultivated under his care." The same definition applied in 1880 and 1890, and was also included in the description for 1900. In 1900 a farm as defined included all the land under one management, used for raising crops and pasturing live stock, with the wood lots, swamps, meadows, etc., connected therewith.

The Massachusetts state census of 1875 defined a farm as the home of a farmer, his workshop, and his means of obtaining a subsistence. This description necessitated certain appliances to enable him to carry on successfully the work of the farm. These necessary adjuncts comprised arable soil for crop land, pasture land for stock, woodland for material for fuel, fences, etc., in short, all the land from which he obtained his crops or which he devoted to pasturage, woodland, etc., whether in direct connection with his homestead or not, and the buildings requisite for housing family, products, and animals, etc. This description also applied to the censuses of 1885 and 1895, but the census of 1895 included also mines, quarries, pits, etc.

These definitions help in some degree to explain the great variation between number and acreage of farms in the state of Massachusetts as returned at the different censuses by the Federal and state governments, but they do not satisfactorily account for such variations.

The Twenty-fourth Annual Report of the Bureau of Labor Statistics of the State of Ohio covers the year 1900, practically the year covered by the Federal Census. That report contains statistics for 2,362 manufacturing establishments, and the information agrees in character with the census reports. The Federal Census Office secured this information, and it might, under some form of coöperation, have placed the information at the disposal of the state; or the state, having secured the returns, might have furnished copies to the Federal Census. It is not good business for both governments to collect the original data.

The Eleventh Biennial Report of the Bureau of Labor Statistics of the State of Illinois (that for 1900) presents statistics for manufactures of the state as reported by a number of establishments engaged in the principal industries. The report shows the number of establishments, character of organization, capital invested, average number of employees, amount of wages, value of goods made or work done, and other items identical with those included in the reports of the Federal Census. There are many other states which collect like data, but those cited are sufficient to illustrate the necessity of coöperation.

Not only are expenses multiplied by this constant duplication of work by the Federal and state governments, but the antagonistic results are perhaps of even greater importance than the duplication of expense, for this antagonism throws doubt and uncertainty on published reports, and the constant annoyance of manufacturers, as already stated, will in time have the effect of destroying the possibility of obtaining exact data.

A study of Federal and state government reports, especially those of industrial statistics, leads to the conclusion that the predominating characteristic of such reports is their lack of harmony. It is almost impossible to obtain from them a uniform line of figures on any subject, and if the same subject is treated uniformly there is a great variation in the method of presenting the figures. This practice largely destroys the practical utility of the various reports.

After July, 1902, the Federal Census Office will take up the collection of the statistics pertaining to most of the subjects named in the law approved March 6, 1902. Agents will be employed to visit various sections of the country, and they will be engaged in making canvasses of one or more of the topics enumerated up to the time of beginning the quinquennial census of manufactures in 1905. It therefore seems to be a very reasonable proposition that if the statistical bureaus of any of the states contemplate the collection of data on such subjects, they should at once enter into some coöperative relation with the Federal Census Office; and, as it is understood by the writer, the Census Office welcomes

correspondence with the heads of state offices and will be glad to entertain suggestions for the incorporation in the Federal schedules of inquiries soliciting information of local interest. Of course, uniform schedules will necessarily be adopted for all sections of the country, but this does not preclude the possibility of incorporating in such schedules particular inquiries for local purposes.

4. *Advantages of Coöperation.*—It is believed that coöperation between the Federal and state offices devoted to statistical inquiry will result, first, in decreasing the expenses of the Federal Census Office and of state statistical offices; second, in enabling the state offices to do much more than they are now able to do with their limited appropriations; third, in strengthening and vitalizing the state offices so that their work in every direction will be more efficient and acceptable; fourth, in securing uniform results which can be utilized by both Federal and state offices; and fifth, in avoiding the constant canvass of the people, thus insuring more readiness on the part of individuals to acquiesce in the requests of the several governments and to return more careful and better digested replies.

Such coöperation was provided for in the law enacted for taking the Tenth Census, by allowing any state taking a census on the mean year of the Federal censuses and adopting the Federal census schedules to receive payment from the Federal Government for a portion of the expenses involved. A few states took advantage of this law in 1885. The basis of reimbursement to the states was 50 per cent of the amount paid all supervisors and actual enumerators within any state or territory at the United States census next preceding, increased by a sum equal to one-half the percentage of gain in population in such state or territory between the two United States censuses next preceding. This was provided for in the act of March 3, 1879. This provision of law, however, was applicable only to the period between 1880 and 1890, and was not reënacted in the law governing the Eleventh Census. Under the act of 1879 censuses were taken in 1885 in the states of Florida, Nebraska, Colorado, and in the territories of New Mexico and Dakota. The copies required under the act were filed in the office of the Secretary of the Interior, but, there being no permanent Census Office, no publication of the returns was made so far as the United States Government was concerned.

Now, by the establishment of the permanent Census Office, which is to be devoted to the collection of statistics for the entire United States and to the presentation of these statistics so as to show the development in each state, the United States Government has, in spirit at least, reënacted the provisions of the old law, and it remains for the states to coöperate with the Federal Government either through the action of their statistical offices or by legislation. The first step toward this coöperation was taken by the representatives of the state bureaus of statistics of labor at their recent convention in New Orleans, when the following resolution was adopted:

> Whereas, the act of Congress approved March 6, 1902, establishing a permanent census office provides for the collection of various classes of statistics which in some degree and at different times the bureau of labor and other statistical offices in the several states collect for their respective localities; and
>
> Whereas, said act provides for the collection in 1905, and every ten years thereafter, of statistics of manufactures confined to manufacturing establishments under the factory system; and
>
> Whereas, it is desirable that the work of the state bureaus and that of the permanent Census Office of the Federal Government should be brought into cooperative relations through the adoption of some plan by which the work of the Federal and state governments in the lines indicated can be made practically uniform: Therefore, be it
>
> *Resolved*, That in order to secure proper cooperation between the Federal Census Office and the various state bureaus, a committee of four be appointed, of which committee the president of this association shall be one, to confer with the Director of the Federal Census and to represent the interests and work of the state labor bureaus; and, further, that in conference with the Director, such Federal and state legislation as may be necessary for securing cooperative relations be considered and reported, with other recommendations, at the next meeting of this association.

In accordance with this resolution a committee has been chosen for the purpose of conferring with the Director of the Census and his statistical staff, with a view to organizing some method of coöperation. The attitude of the state officials is all that could be expected. It is believed that those states in which statistics of manufactures are usually taken, and especially where they are to be taken in 1905, will readily join with the Federal census, either by abandoning their state work in that year, if necessary, or, preferably, by collecting the data which the Federal Government may require, turning over to the Federal census such results as it may wish, and receiving in return reimbursement for a reasonable proportion of the expense involved. Some such system can be applied between state governments and the Federal Government in nearly all the branches of statistical inquiry enumerated in the act creating the permanent Census Office. Should such a system be organized, it is believed that the future statistical service of this country would be greatly enhanced, not only in efficiency, but in the accuracy and utility of the results obtained. If legislation be necessary to secure this coöperation, it should be formulated without delay, and it is confidently believed that the states will reciprocate and pass such laws as may be necessary to accept the coöperative efforts of the Federal Government. Certainly the importance of coöperation is clearly established.