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ARMY INDUSTRIAL COLLEGE.

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SCOPE OF THE CENSUS OF MANUFACTURES.

Lecture

by

Mr. J. F. Daly.

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INTRODUCTORY REMARKS - COL. I.J. CARR.

Gentlemen;

In planning for Industrial Mobilization we are very much concerned with the work the Bureau of Census is doing in the line of manufacturing statistics. We have touched on the commodity end somewhat, we are now going into the manufacturing end with a view of finding out what the Bureau of Census and the manufacturers are doing, what they have that we can use in our studies, and how they can assist us in getting out their Census requirements in our own planning.

Mr. J. F. Daly is the Executive Chief of the Division of the Census of Manufactures and has consented to come here this morning to give us a set-up of the general routine of the Census Bureau and particularly the routine of his own division.

I take great pleasure in introducing Mr. Daly.

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SCOPE OF THE CENSUS OF MANUFACTURES.

Gentlemen.

I am going to give you a little outline, rather a historical sketch of the work of the Bureau of the Census from its foundation back in 1790.

The United States Census is provided for in Article I of the Constitution. It is there made the basis of representation and direct taxation. Members of the House of Representatives are apportioned to the several states according to the census returns. President Washington, who was largely instrumental in laying the foundation of the census, and was the de facto Director-in-Chief of the first census, looked upon it also as the official record of the country's military strength. The census, therefore, has been from the beginning one of the fundamental institutions of the Republic.

The first census, that of 1790, was restricted to population. The enumeration was conducted by seventeen United States Marshals and their six hundred and fifty assistants. The marshals sent the returns direct to the President who turned them over to Thomas Jefferson, Secretary of State, the latter preparing a report for the printer. This report was a little octavo volume of fifty-six pages, three copies of which are still extant, two in the Census Bureau and one in the Library of Congress. The transition from the fifty-

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six page volume of the first census to the forty thousand pages of the census of today reflects not only the development of the census but the growth of the Nation since the adoption of the Constitution.

At the census of 1810 there was attempted, for the first time, a collection of industrial statistics, the work being done by the marshal's assistants in connection with the enumeration of the population. The kinds, quantities and values of manufactured goods were shown for each State and Territory, and a few brief and fragmentary statistics relating to the products of quarries were included. The data gathered at this census were inaccurate and far from complete, but were nevertheless of value as furnishing a general indication of the extent and nature of the manufacturing industries of the country.

At each succeeding census the subjects were reported in somewhat greater detail than at the preceding one. In 1820 the first attempt was made to ascertain the numbers engaged in agriculture, commerce and manufacture.

The seventh census, that of 1850, was looked upon as the foundation of the present system of industrial statistics conducted by the Bureau of Census. At that time the census was transferred from the Office of the Secretary of State and made a division of the newly created Department of the Interior, given an official head or superintending clerk. The industrial census was extended to cover the number of manufacturing establishments, capital, em-

ployees and wages, cost of materials, value of products, percent of profit, home manufacture, and data of special industries.

Similar statistics were obtained for mines and quarries.

From that first census, covering population only, has developed the present organization with five divisions, each with a chief statistician in charge. They are in the order of establishment: Population, Manufactures, Agriculture, Vital Statistics, and Statistics of Cities. At present the Census of Population is taken decennially, the Agriculture quinquennially, of Manufactures biennially, and those of Vital Statistics and Statistics of Cities annually. In addition to their main reports as described by their names, the different divisions issue periodical reports as follows: thirteen (13) annual, three (3) semi-annual, five (5) quarterly, nineteen (19) monthly, and one (1) weekly. A census of five years intervals is also taken of all kinds of electrical activities, the first having covered the year 1902; and another inquiry is taken decennially covering water transportation of every nature.

Besides these five grand divisions there is that of the geographer which issues no periodical reports but is engaged in important statistical activities of various kinds, and the Survey of Current Business. This last originated in 1921 and is issued by the Bureau of Census in connection with the Bureau of Foreign and Domestic Commerce and the Bureau of Standards. It covers a wide variety of subjects in graph, textual and tabular form, is considered one of the most valuable to business of all government pub-

lications and compiles monthly reports on nineteen (19) subjects and quarterly reports on two (2) others. A complete list of these periodical publications is attached.

After this brief sketch of the development of the Census Bureau I will endeavor to give you a brief outline of industrial census-taking as now conducted by it, and of the methods employed in doing the work.

Beginning with 1810 there have been altogether fifteen industrial censuses, not including the 1925 census. These range from the incomplete enumeration of earlier decades to the elaborate and painstaking inventory of industrial progress made today. Here it may be well to mention that since 1920 the Census of Manufactures has been taken at two-year intervals, between 1900 and 1920 enumerations were made at five-year intervals, and prior to 1900 a census of industry was taken only at ten-year periods. The shortening of the time between censuses is indicative of the growing importance assumed by manufacturing in the economic and social structure of the United States.

#### Planning an Industrial Census.

As all census investigations are based on Congressional enactments, one of the first considerations is as to what the law authorizes and directs to be done. After this is determined and the scope of the inquiry defined, an estimate of the cost of the investigation is made and submitted to Congress, now through the Bureau of the Budget. It is needless to say that the estimates

must be most carefully prepared, as they now face the pruning knife of both the Director of the Budget and Congressional Committees.

In some instances the Census Bureau has encountered considerable opposition to the making of any appropriation, as was the case for the 1920 Census of Manufactures. The year 1919, to which this investigation related, immediately followed the World War and the Chairman of the Census Committee reasoned that as conditions were abnormal in American industry no census should be taken. Naturally, the Bureau pointed out to the Committee that a census of industry at that time, reflecting as it would conditions brought about by the World War, would offer valuable data in forming the constructive measures for peace-time pursuits, and the necessary appropriations were recommended.

A major census investigation such as the industrial census is divided into three distinct stages, which may be stated as follows:

1. Preliminary Work Defining the scope of the investigation, planning the schedules of inquiry, estimating the cost, arranging for appropriations, dividing the United States into districts, and providing for the creation of a field force to gather the data.
2. Field Work or actual enumeration.
3. Tabulation and Summarization of the results.

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Preparing the Schedules of Inquiry.

A vital part of the preliminary work is the preparation of the schedules of inquiry, for on this base the entire statistical structure of the census is reared. Some months before the date of the actual enumeration the preparation of the schedules to be used in gathering the data must be started. The schedules of inquiry must conform to the general requirements of the law, and yet they must be modernized and vitalized to reflect the latest trends in the characteristics of manufacture. There are distinguished in the 1923 Census of Manufactures, three hundred forty-eight main classifications and three hundred fifty-one sub-classifications, and these increase the complexity of schedule building. About seventy-eight special schedules must be devised to record the varying facts pertaining to kind, quantity and value of articles produced and materials consumed. Those industries for which no special or detailed information is required as to materials consumed and goods manufactured are represented by a general schedule calling for the usual census inquiries as to wage earners and wages, cost of materials, and value of products. The employment of special schedules depends to a great extent upon the importance or rank of the industry. It will readily be seen that very much more detailed information must be gathered for the great basic industries such as iron and steel, textiles, transportation, etc., than for the smaller industries, or for those for which materials and products cannot be stated in a qualitative or a quantitative way. Thus, when all of the special schedules were assembled for the 1923 Census of Manufactures, more than eight

thousand (8,000) specific inquiries regarding proprietors and firm members, salaried officers and salaries, wage earners, wages, materials, number, kind, quantity, and value of products, and horsepower were made covering industrial operations.

The thought may be in your minds that preparing elaborate schedules of inquiry in the somewhat cloistered precincts of a Washington office partakes somewhat of the nature of an academic proceeding. Such undoubtedly would be the case if the demands of the industrial world and the particular requirements of each industry were not made the subject of most careful study.

Until 1920 it had been the policy of the office to give precedence to the relative magnitude of industrial activity by states or geographic divisions. Considerable difficulty was experienced in obtaining the reports from the various manufacturers, great numbers of them entertaining the impression that the data were obtained primarily for taxation purposes. The reports at previous censuses, up to 1909, asked for additional data covering miscellaneous expenses, the obtaining of which naturally gave an approximation of the net earnings of any individual establishment. As it was not the purpose of the Bureau to conduct its canvas for this purpose, at succeeding censuses this inquiry has been eliminated, and I believe this has had a beneficial effect on industry as a whole to the extent that it is now evidencing a decided attempt to collaborate with the Bureau in preparing the reports at each census. The principal criticism against the Bureau was the delay

in publishing the results obtained. While there may have been justification as to the criticism, based upon the lateness of the publication of the reports, unfortunately this was caused to a great extent by the delay of the manufacturers themselves in forwarding the reports to the Bureau.

Industry, particularly during the last ten years, has begun to appreciate the reports. Each particular line of industrial activity has its own organization looking after the interests of the industry as a whole. These organizations, or manufacturers' associations as they are commonly termed, have increased each succeeding year, and they, as collateral organizations, have in Washington a national association of manufacturers which is the general clearing house of the individual industrial organizations. These organizations, instead of being a detriment, have proved of material value to the office. Practically every establishment worth while is a member of the organization representing their line of activity. Individual manufacturers, due to the laws of competition, are anxious to ascertain information, most frequently of a statistical nature, for the conduct of their business and refer the matter invariably to the industrial organization. They, in turn, pass it on to the Census Bureau which they now recognize and appreciate as the greatest statistical bureau in the world. The Bureau, on the other hand, recognizes each of these organizations to the extent that tentative schedules are submitted to hundreds of associations of industry and to numerous individual manufacturing establishments for criticism as to form and content.

In addition, many helpful suggestions are obtained from the thousands who ask for Census data or who have occasion to communicate with the Bureau. All constructive criticism received, from whatever source, is carefully weighed and catalogued for future use in the improvement of the schedules. The schedules reflect, therefore, the requirements of American industry for fundamental and detailed information, so far as it is humanly possible to do so.

The Preparation of the Card Index of Establishments.

Usually the first question asked, when there is a disagreement with the Census figures, is "How do you know that you have covered the entire field?". The answer to this question leads me to mention somewhat in detail the card index of manufacturing establishments, the careful preparation of which contributes much to the completeness and accuracy of the Census. We have as a base for this roster of industry the names and addresses of all manufacturing establishments reporting for the preceding Census. To this basic list there are added the names of all new establishments which appear in the latest trade directories and the lists compiled by the various associations of industry. Many Chambers of Commerce in important industrial centers and other local organizations now maintain lists of new industrial establishments, and hundreds of these associations cooperate with the Census Bureau in supplementing the Bureau's card index of manufacturers. For convenience in eliminating duplicate names, and to facilitate comparison with lists of industrial associations, the Bureau's card index

is arranged by industrial classifications, which arrangement is maintained until the beginning of the field activity. Finally, the personnel canvass made of the entire United States by the Bureau's representatives assures that no establishment of importance is omitted.

Central Offices.

Among the one hundred ninety-six thousand (196,000) establishments that reported at the industrial census for 1923 there was a very important class to which particular attention must be given in any plan for a census. These are the so-called Central Office companies operation in many instances a number of enterprises. There were nine thousand five hundred and ninetytwo (9,592) such companies in 1923 and they represented approximately thirty thousand (30,000) individual plants. Through inquiry of each company, in the course of preparing the lists, we learn whether the census reports will be given at the General Office or at the individual plants. A notation placed on the index cards supplied to the field agent not only informs him that the report will be obtained elsewhere but likewise prevents the agent from making useless calls. By placing in the hands of the Bureau's representative a card for each known establishment in that territory he is to canvas, new establishments are more readily located.

Districting the United States.

Prior to the beginning of the actual enumeration, the entire United States is divided into four hundred to five hundred

working districts. These districts, wherever practicable, are made to conform to the boundaries of county or other minor civil divisions. In important manufacturing cities several districts are created. In theory we try to arrange the working district so that not over three months work will be required of one agent. If the working districts were made much smaller there would be little incentive for one to take the job. Neither would the agent exhibit the same interest nor acquire the same proficiency in the discharge of his duties, and these are considerable factors bearing upon the accuracy and completeness of the census.

About this time steps must be taken looking to the establishment of a list from which local agents may be selected. Some attempts have been made to use the Civil Service in providing a field force, but on account of the brief duration of the work this method has not proved practicable. Instead, the Bureau relies on publicity methods, through press comment, usually, to arouse interest, and all applications for work are carefully filed in the Appointment Division for future use. In case of a dearth of applicants in any District the Congressman is usually an unfailing source of aid.

Collecting the Data.

Having briefly noted the plans for taking a census, we come to the consideration of actually gathering the data. In this two methods are followed, first, by the mail campaign, and later by the personal visitation of an agent. Even with the authority of

law behind the Bureau, getting reports for all establishments is not an easy task. Many and varied are the reasons set forth as to why the Census report is not forthcoming. Among these reasons are time required for the balancing of books and making income-tax statements; the burden of making other reports to Federal and State governments; the concern's books are not kept so as to give Census data without great labor, not to mention the dispeptic, the chronic grouch, and the individual who is always "agin the Government", and all its cohorts. With the better understanding among manufacturers, however, of the objects and purposes of the industrial census, the Bureau accomplishes more and more by the mail campaign, and each succeeding census shows a greater proportion of schedules forwarded by mail, nearly sixty-five percent having been received from that source in the 1923 census. In follow-ups, as many as four requests are sometimes sent out to a manufacturer requesting the return of the schedules. In addition, telegrams are sent to the more important companies. If the telegraphic, or fifth request is ignored, the Bureau concludes that the manufacturer is hard-boiled and preparations are made to turn over the delinquent to the field agent for personal visitation. As the mail campaign draws to a close, that is to say when the requests for the forwarding of schedules are no longer heeded, preparations are made for shifting the work from the Washington office to the field. Henceforth importunate requests for the return of the census schedules are borne by one of the Bureau's representatives, and not by the United States mails.

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When the mail campaign is closed, the index cards which have hitherto been used in the circularization of manufacturers are withdrawn from office use and allocated to the various working districts. States or lesser areas are assigned at this time to the general charge of an office agent, whose duty it is to see that the index cards are marked to show the result of the mail campaign - whether complete or incomplete schedules have been received - or other facts pertaining to the report of the individual establishment. To facilitate the field work, the cards for each working district are arranged alphabetically by counties, post offices and towns, and then routed so as to permit of the most expeditious canvass by the agent.

As the working district is the unit of operation, all supplies necessary for the canvass of the district must be assembled. These comprise, in addition to cards for all establishments, which show name, location and product, the requisite number of blank schedules to correspond with the number and type of manufacturing enterprises in the district, instructions to the agent as to the scope of the census and the nature of his duties, together with blank forms on which to forward a daily report of schedules obtained and calls made.

The schedules, lists and supplies having been carefully checked, the office agent prepares to take up active field work. He is in charge of the attack on recalcitrant manufactures. To get the canvass under way promptly, not more than five or six working districts are usually assigned to one office agent. The

office agent now proceeds to the headquarters of a certain district, which is usually the most important industrial center, and by arrangement meets the various applicants and selects and recommends the appointment of the best qualified. An appointment by wire is usually made by the Bureau, on the strength of the office agent's report.

After instructing the local agent, the office representative works with him for three or four days, or until such time as the local agent is thoroughly acquainted with the nature of the work. When all local agents are instructed, usually about three hundred and fifty altogether, the Bureau's Representative makes a personal canvass of one of the most important of the districts assigned to his charge.

In making assignments of its trained personnel to the field, the Bureau is careful to place them in strategic positions so that in the event of a failure or disability of a local agent the office representative can be called on to straighten out the difficulty or recommend the appointment of a new agent. Multiply the activity of the office agent just described by one hundred and the canvass of the United States in an industrial census is underway in the course of about three weeks.

Daily reports are made by all field agents to the Washington office, and the return of index cards and schedules is a ready gauge of the progress of the work. In ten or twelve important districts such as New York City, Philadelphia, etc., the field work is considered under the supervision of a Chief Special Agent,

to whom the local agents make daily reports, the field product from these industrial centers being forwarded weekly to the Washington office. A careful check is made day by day of the work of each field agent. The system of accountability for cards and schedules facilitates this control.

In the control of field expense we are not so well off. As expense accounts are rendered monthly, accountability for following instructions is not so swift. In one instance, in the State of Pennsylvania, in a county where good roads and electric and steam railroads abound, the local agent found it necessary to incur the expense of automobile hire for twenty days in succession, at \$25.00 per day, instructions as to the use of regular means of communication to the contrary notwithstanding. Of course, the agent was suspended promptly and his expense account disapproved, and for aught I know he is still clamoring at the door of Comptroller General McCarl for his money.

Cost of the Industrial Census.

It may be a matter of interest to learn of the cost of these industrial censuses. The 1920 Census of Manufactures, one of the most elaborate ever made in scope and detail, cost about two million dollars, the expense being about equally divided between field and office. The biennial censuses of 1921 and 1923 were somewhat restricted in scope and cost \$800,000 and \$750,000 respectively. Very great savings have been effected by the present Director, William M. Stewart, in cutting down the cost of

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field work through cooperation with Chambers of Commerce and other local organizations to the mutual benefit of the Census Bureau and the cities cooperating. An increasing desire on the part of many wide-awake Chambers of Commerce to study their industrial problems with the aid of fundamental data afforded by the industrial census induced the Director of the Census at the 1923 Census of Manufactures to effect cooperative arrangements with one hundred and ninety-six Chambers of Commerce and one hundred trade organizations. This cooperation extended all the way from moral support to taking entire charge of the canvass for the city. In the latter case, local agents were appointed by the Bureau, on the recommendation of the local Chamber of Commerce, but the actual direction of gathering the data and the conduct of the work was under the supervision of the local organization. In certain cases a Census agent was on duty as an assistant.

So successful was the plan and of such benefit to the industrial organizations, that six hundred and ninety-five Chambers of Commerce and four hundred and eighty-eight industrial organizations cooperated in the 1925 Census of Manufactures.

One incident following the 1923 canvass will illustrate the reason for the growing spirit of cooperation between the Census Bureau and Chambers of Commerce. As rapidly as the data for a city could be compiled, a detailed tabulation for all industries was forwarded to the cooperating Chamber of Commerce, with the advice that the publication of the information would be made through that organization, the Census Bureau asking only that it be sup-

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plied with the release data. This arrangement permitted the Chamber of Commerce to publish the Census report as industrial news of much interest locally. In following this plan many situations arose calling for diplomacy, as when some industrial rival asked the Bureau to supply it with a similar report, to keep faith with those who had assisted us we could only refer the inquiry to the other city with our compliments and best wishes, refusing to supply the information.

#### Establishments Enumerated.

The number of establishments covered at each census is probably the source of confusion to some users of industrial data. From 1810 to 1900 the industrial censuses covered all establishments of productive industry, including the neighborhood, household and hand trades. At the 1900 census the number of establishments had increased to over half a million. The reports of many of these concerns were of no statistical value, and of little economic significance. When the Manufactures Census was put on a five-years basis, establishments with products valued at less than \$500 for the year and the hand trades were omitted, and the number of establishments fell to two hundred sixteen thousand, one hundred and eighty (216,180). By 1920, however, the number had risen to about two hundred fifty thousand (250,000). Following the 1920 Census of Manufactures the investigation was put on a two-year basis and a still further reduction was made in the number of establishments to be canvassed. After a conference with associations of industry and leading manufacturers, it was decided to omit from the 1921 Census establishments whose product did not amount to \$5,000

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annually. It was even suggested by some that this exclusion be extended to those establishments the annual value of whose products is less than \$20,000. By this limitation fifty-three thousand, nine hundred ninety-nine (53,999) concerns were dropped. This class of establishments, although numerically great, and representing more than one-fifth of the total number reported, covers only six-tenths of the one percent of total wage earners and three-tenths of one percent of the total value of products.

As the cost of obtaining the reports of these small establishments, due to their remoteness, was probably greater than for any other class it will be readily seen that a very great savings was effected. With the present effort for economy in the expenditure of Government funds, this action by the Census office was doubtless highly appreciated by the Administration.

Considerable economic data are involved in the reports prepared by the division, and as a result of the activities of the industrial organizations the Bureau has changed its entire scheme of presenting the figures and instead of giving precedence to geographical data is now presenting figures along the lines of industrial activities. The relative importance of Pennsylvania and New York State, for instance, for manufacturing is lost sight of. The relative importance, however, of the several states is contrasted in the report of any particular industry. The tendency to transfer cotton mills, for instance, from New England to the South is readily appreciated from the reports prepared. The reason for the migration is based upon the census figures in the form of production

of cotton as reported to us under the Agricultural Division, which reports at stated periods each year the amount of cotton ginned. The economy in power based upon the South's natural water supply is presented in the figures of the census relating to electrical industries. The source of materials used as products of one establishment which, in turn, become the materials of another and the relative cost of the production are presented in these special bulletins. As an example, the hides and leather from the slaughtering and meat-packing establishments and their value as they leave the plant become the material of the tannery, the tanning product becoming the material of boots and shoes, saddlery and harness, trunks and valises, etc. The relation of the raw material to the finished product can be stated and each manufacturer will be in a position to appreciate, at least relatively, whether the conduct of his plant is economical as contrasted with others in the same line of endeavor. The various industrial organizations are appealing to the Bureau to obtain more detailed information along special lines as relates to other individual industries which have an important bearing on the conduct of the industry itself.

An example of the extent to which individual concerns are interested can be best illustrated by mentioning several forms of inquiries which have been presented to the office. One concern writes that the average unit value of their product is higher than the average shown by the statistics furnished, and they desire to check output of plant against the average output of those reporting. Another asks for our manufactures reports, which would be

of great assistance in planning a distribution and sales campaign. One manufacturer inquired for statistics on the paper-box industry in order that he might determine whether or not his business was keeping step with general business conditions throughout the country, particularly as relate to that industry.

During the period of the World War the Census Bureau performed important work for the War Department as well as other agencies such as the Provost Marshal General's office, Treasury Department (Liberty Loan work), U.S. Shipping Board, National Red Cross, Department of Justice, Council of National Defense, etc. Of special interest were inquiries covering the production and stocks of iron and steel, wool machinery and wool, manufacturers, kapok fiber, jute and silk, stocks of leather goods and manufactured products, antimony, graphite crucibles, nitric acid and acids used in the manufacture of explosives, and the production of dental gold.

Encl.

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Population Division.

Annual.  
Marriage and Divorce

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Manufactures Division

Annual Inquiries

- The clay products industries.
- Manufacture and sale of farm equipment.
- Manufacture of lighting equipment.
- Insecticides and fungicides.
- Constant potential transformers.
- Forest products
  - Sales of cork products.
  - Lumber, lath and shingles.
  - Pulpwood, consumption and wood-pulp production.
  - Turpentine and Rosin.

Semi-Annual Inquiries

- Paint and varnish production and sales.
- Sulphuric acid and acid phosphate, produced, consumed, sold, and in stock - fertilizer industry.

Quarterly Inquiries

- Production and stock of edible gelatin.
- Production and stocks of glues of animal origin.

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Agriculture Division

Semi-Annual Inquiries

- Wheat stocks.

Quarterly Inquiries

- Wheat stocks.
- Wool stocks.
- Fats and oils, production, consumption and stock.
- Leaf tobacco, stocks.

Monthly Inquires

- Boots and shoes, production (Leather).
- Hides, skins and leather
  - Glove leather
  - Shoulder and grain inner-soles
  - Sole and belting, harness and ~~shoes~~
  - Inner ~~soles~~

Monthly Inquires, cont'd.

- Hosiery production, orders and stocks.
- Knit underwear.
- Leather gloves and mittens.
- Malleable castings.
- Mechanical stokers.
- Men's and boys' clothing cut.
- Pyroxilin coated textiles.
- Steel barrels.
- Wheat ground and wheat milling products.
- Work clothing.
- Wool consumption.
- Wool manufactures, activity of machinery in.
- Cotton ginned (12 reports during season).
- Cotton consumption and stocks.
- Cotton spinning industry, activity in.
- Cottonseed and cottonseed products.

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Vital Statistics Division.

Annual Bulletins

- Principal causes of death by states.
- Principal causes of death by Registration area.
- All causes of death - Registration area.

Monthly Bulletin

- Automobile fatalities.

Weekly Bulletin

- Weekly Health Index.

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Survey of Current Business.

Quarterly

- Electrical goods.
- Mining and industrial electric locomotives.

Monthly

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|---|---------------------------------|
| Automobiles.                                  | Plumbing.                       |
| Babbitt metal.                                | Pumps.                          |
| Boxboard.                                     | Steel castings.                 |
| Electrical industrial trucks<br>and tractors. | Steel furniture.                |
|   | Structural steel, (fabricated). |