

EIGHTH BIENNIAL REPORT

OF THE

Bureau of Labor Statistics

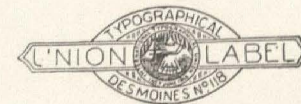
FOR THE

STATE OF IOWA.

1897-98.

W. E. O'BLENESS, Commissioner.

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LETTER OF TRANSMITTAL.

OFFICE OF COMMISSIONER OF LABOR STATISTICS, }
DES MOINES, Iowa, October 2, 1899. }

Hon. Leslie M. Shaw, Governor of Iowa:

SIR—In compliance with the law creating this office, I have the honor to herewith transmit to you the eighth biennial report of this department. Very respectfully,

W. E. O'BLENESS,
Commissioner.

INTRODUCTORY.

In the report of the BUREAU OF LABOR STATISTICS for the years 1894 and 1895 some very strong recommendations were made for a new law governing the office; a law that would enable the commissioner to disseminate information and facts, not estimates. The Twenty-sixth General Assembly took the matter under consideration, and, after long and thorough investigation, brought about the following law:

CHAPTER 8.

OF THE BUREAU OF LABOR STATISTICS.

Section 2469. Commissioner. The bureau of labor statistics shall be under the control of a commissioner, biennially appointed by the governor by and with the advice and consent of the executive council, whose term of office shall commence on the first day of April in each even-numbered year and continue for two years, and until his successor is appointed and qualified. He may be removed for cause by the governor, with the advice of the executive council, record thereof being made in his office; any vacancy shall be filled in the same manner as the original appointment. He shall give bonds in the sum of \$2,000 with sureties to be approved by the governor, conditioned for the faithful discharge of the duties of his office, and take the oath prescribed by law. He shall have an office in the capitol, safely keep all records, papers, documents, correspondence, and other property pertaining to or coming into his hands by virtue of his office, and deliver the same to his successor, except as hereinafter provided.

Section 2470. Duties—report. The duties of said commissioner shall be to collect, assort, systematize, and present in biennial reports to the governor statistical details relating to all departments of labor in the state, especially in its relations to the commercial, social, educational and sanitary conditions of the laboring classes, and to the permanent prosperity of the mechanical, manufacturing and productive industries of the state, and he shall as fully as practicable collect such information and reliable reports from each county in the state, the amount and condition of the mechanical and manufacturing interests, the value and location of the various manufacturing and coal productions of the state, also sites offering natural or acquired advantages for the profitable location and operation of different branches of industry; he shall by correspondence with interested parties in other parts of the United States, impart to them such information as may tend to induce the location of mechanical and producing plants within the state, together with such

other information as shall tend to increase the productions, and consequent employment of producers; and in said biennial report he shall give a statement of the business of the bureau since the last regular report, and shall compile and publish therein such information as may be considered of value to the industrial interests of the state, the number of laborers and mechanics employed, the number of apprentices in each trade, with the nativity of such laborers, mechanics' and apprentices' wages earned, the savings from the same, with age and sex of laborers employed, the number and character of accidents, the sanitary condition of institutions where labor is employed, the restrictions, if any, which are put upon apprentices when indentured, the proportion of married laborers and mechanics who live in rented houses, with the average annual rental and the value of property owned by laborers and mechanics; and he shall include in such report what progress has been made with schools now in operation for the instruction of students in the mechanic arts and what systems have been found most practical, with details thereof. Such report shall not contain more than 600 printed pages, and shall be of the number, and distributed in the manner, provided by law.

Section 2471. Power to secure evidence. The commissioner of the bureau of labor statistics shall have the power to issue subpoenas, administer oaths, and take testimony in all matters relating to the duties herein required by said bureau, said testimony to be taken in some suitable place in the vicinity to which testimony is applicable. Witnesses subpoenaed and testifying before the commissioner of the bureau shall be paid the same fees as witnesses before a justice court, such payment to be made out of the contingent fund of the bureau in advance, but such expenses for witnesses shall not exceed \$100 annually. Any person duly subpoenaed under the provisions of this section, who shall wilfully neglect or refuse to attend or testify at the time and place named in the subpoena shall be deemed guilty of a misdemeanor, and upon conviction thereof, before any court of competent jurisdiction shall be punished by a fine not exceeding \$50 and costs of prosecution, or by imprisonment in the county jail not exceeding thirty days; provided, however, that no witness shall be compelled to go outside the county in which he resides to testify.

Section 2472. Right to enter premises. The commissioner of the bureau of labor statistics shall have the power, upon the complaint of two or more persons, or upon his failure to otherwise obtain information in accordance with the provisions of this act, to enter any factory or mill, workshop, mine, store, business house, public or private work, when the same is open or in operation, upon a request being made in writing, for the purpose of gathering facts and statistics such as are contemplated by this act, and to examine into the methods of protection from danger to employes, and the sanitary conditions in and around such buildings and places, and make a record thereof; and any owner or occupant of such factory or mill, workshop, mine, store, business house, public or private work, or any agent or employe of such owner or occupant who shall refuse to allow any officer or employe of said bureau to enter, or who shall hinder him, or in any way deter him from collecting information, shall be deemed guilty of a misdemeanor, and upon conviction thereof, before any court of competent jurisdiction, shall be punished by a fine of not exceeding \$100 and costs of prosecution, or by imprisonment in the county jail not exceeding thirty days.

Section 2473. Meaning of terms. The expression, "factory," "mill," "workshop," "mine," "store," "business house" and "public or private work," as used in this act, shall be construed to mean any factory, mill, workshop, mine, store, business house, public or private work, where five or more wage-earners are employed for a certain stipulated compensation.

Section 2474. Reports of bureau. It shall be the duty of every owner, operator or manager of every factory, mill, workshop, mine, store, business house, public or private work, or any other establishment where labor is employed as herein provided, to make to the bureau, upon blanks furnished by said bureau, such reports and returns as said bureau may require for the purpose of compiling such labor statistics as are contemplated in this act; and the owner, operator or business manager shall make such reports or returns within sixty days from the receipt of blanks furnished by the commissioner, and shall certify under oath to the correctness of the same. Any owner, operator or manager of such factory, mill, workshop, mine, store, business house, public or private work, as herein stated, who shall neglect or refuse to furnish to the commissioner of labor such reports or returns as may be required by the following blank, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding \$100 and costs of prosecution, or imprisoned in the county jail not exceeding thirty days.

BLANK.

Name of firm or corporation..... Number of hands employed during year ending December 31,, males....., females....., apprentices..... Total amount of wages paid during year ending December 31,, \$..... Total amount of wages paid previous year, \$..... Any general increase or reduction of wages during the past year? If so, what per cent of increase or reduction?..... Cause of increase or reduction..... Any increase or decrease of business during past year?..... What means are provided for the escape of employes in case of fire?..... What measures are taken to prevent accident to employes from machinery?..... How are buildings ventilated?..... Are separate water-closets and wash-rooms provided for the different sexes?..... Number of weeks during past year business was run on full time with full force..... Number of weeks during past year business was run on short time or with reduced force..... Number of weeks during past year business was suspended..... Number of strikes during year ending December 31,,, number involved..... alleged cause....., result..... How many days did strike continue, and what was loss of wages in consequence thereof?..... Was any property destroyed, and, if so, its value?.....

Section 2475. Use of information. In the reports of the commissioner no use shall be made of names of individuals, firms or corporations supplying the information called for by sections 2470 and 2471 of this act, such information being deemed confidential and not for the purpose of disclosing personal affairs, and any officer or employe of the bureau of labor statistics violating this provision shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in a sum not exceeding \$500 and costs of prosecution, or by imprisonment in the county jail not exceeding one year.

Section 2476. Reports and records preserved. No report or return made to said bureau in accordance with the provisions of this chapter, and no schedule, record or document gathered or returned by its officers or employes shall be destroyed within two years of the collection or receipt thereof. At the expiration of two years, all records, schedules or papers accumulating in said bureau during said period that may be considered of no value by the commissioner may be destroyed, provided the authority of the executive council be first obtained for such destruction.

Section 2477. Compensation and expenses. Said commissioner shall receive a salary of \$1,500 per annum, and shall be allowed a deputy at a salary of \$1,000 per annum in lieu of clerk hire, payable monthly, and necessary postage, stationery and office expenses, the said salary and expenses to be paid by the state as the salaries and expenses of other state officers are provided for. The commissioner, or any officer or employe of the bureau of labor statistics, shall be allowed in addition to their salaries their actual and necessary travelling expenses while in the performance of their duties; said expenses to be audited by the executive council and paid out of the general fund of the state upon a voucher verified by the commissioner, provided that the total of such expenses for officers and employes shall not exceed \$500 per annum.

By a careful reading of section 2470 of the above law, it will readily be seen that to follow out strictly the letter of the law it would take an appropriation of at least \$20,000 a year, and to keep constantly in the field not less than ten men. This section simply amounts to a complete census for the state each year. It is simply an impossibility for the bureau as it now exists to carry out, or attempt to carry out, what is contemplated by this section. Rather than this, the general assembly ought to designate some subject, or set of subjects to be investigated in each biennial period. By this method the bureau will have but the one object in view and can thus prosecute it to the fullest extent, and arrive at a conclusion that will be justifiable in the expenditure of this money by the state.

Section 2471 provides that the commissioner shall have the power to issue subpoenas, administer oaths and take testimony in all matters relating to the duties herein declared by said bureau, said testimony to be taken in some suitable place in the vicinity of which such testimony is applicable. Witnesses subpoenaed and testifying before the commissioner shall be paid the same fees as witnesses before a justice court, such payment to be made out of the contingent fund of the bureau in advance. This is not in any way applicable from the fact that there is no such thing as a contingent fund connected in any way with the bureau. A contingent fund ought to be provided for or the law be so amended as to not permit testimony.

Section 2474 gives all persons, firms or corporations employing five or more in the state a right of sixty days in which to report to the bureau after receiving the blanks herein provided. This is too long a time, there being no necessity for more than twenty days in any case. Many institutions who desire to report, knowing that they have sixty days in which to do so, file their blank until some time when they perhaps may have more leisure, and thus forget it entirely or until they are reminded of the fact that they are past due.

In the questions provided by section 2474 there ought to be some method adopted whereby the amount of wages reported could be distinguished so as to show the amount that male help receive, and the amount that female help receive, and the amount paid to apprentices. As it is now reported there is no distinction made in any case.

RECOMMENDATIONS.

The reports of the bureau of labor statistics are published biennially. These reports are valuable to the student and doctrinaire, who out of past conditions desire to spin theories to govern future actions, but to the man dependent upon his daily labor for his daily bread, a knowledge of what the condition of the laboring people was two years ago sinks into insignificance compared with a knowledge of how he can better his own condition now. The length of time which necessarily elapses between the completion of much of the work and the publication of the report greatly diminishes its practical value to those for whose main benefit the office was established. Labor statistics, in order to be of real value to laboring people, must be up to date and published at frequent intervals. Therefore, your commissioner recommends that a bulletin, such as the national bureau and the Massachusetts bureau and other states are now publishing, be published by this bureau quarterly.

GUARDS AND BOILER INSPECTION.

There are a few persons and corporations employing men who have no railing or guards around dangerous machinery, fly wheels and vats. There are a large number of steam boilers being fired by incompetent boys and men. Numerous requests have come to this office asking that these matters be looked into and regulated. Nothing could be done by this office further than to advise and suggest, from the fact that there is no law on the statute books of Iowa regulating the same. There should be a law compelling employers to box or cover all dangerous machinery and shafting, place railings around fly wheels and vats, and there should be some person vested with the power to enforce the same. There ought to be some person whose duty it should be to see to it that no one would be allowed to fire a steam boiler who could not stand a competent examination. Many lives are in constant danger from incompetent handling of steam boilers. Accidents happen in the best

regulated institutions, and the utmost care should be exercised to throw about employes all the safety appliances possible. A very large per cent of the institutions in the state employing labor are very careful in this respect, having in vogue every safety appliance possible, besides the strictest orders to their employes to be careful. This is as it should be. For the few who do not seem to care anything about the safety of their employes, your commissioner makes the above recommendations.

CO-OPERATIVE RAILROADING.

The plan adopted four years ago of assisting those in the employ of the Illinois Central Railroad company in buying, through partial payments, one share at a time, of the capital stock, has resulted in (1897) 399 officers and employes (other than the board of directors) now owning 1,969 shares, and in 1,624 having made partial payments on account of the further purchase of one share apiece. The sum held by the company for partial payments on such purchases amounted at the close of the year to \$54,794.33, representing an average payment of \$33.74 on each share. Previous to the adoption of this plan, few if any of the company's shares were owned by those living on or near the railroad elsewhere than in Chicago, Cairo and New Orleans. The purchases by employes have led to buying by others living on the line, and at present there are registered on the company's books residents of every state and of almost every county served by the railroad. In order to insure a large attendance of stockholders at the regular meeting thereof the directors of the road issue free transportation to and from Chicago to all persons holding stock, wherever located.

One year later, June 30, 1898, the number of officers and employes (other than directors) of the corporation registered on the books of the company as stockholders has increased to 733, and their holdings amount to 2,536 shares. The stock is being gradually purchased by those resident on or near the line. In each of the ten states in which the company is operating railways there are a number of stockholders, varying from 4 in Indiana to 732 in Illinois. The total number of stockholders in these ten states is 1,115, and the number of shares held by them 23,630. There are resident in the United States 3,365 stockholders, owning 273,709 shares; in Great Britain 2,896, owning 229,252 shares; elsewhere 120, owning 57,983 shares.

Exclusive of one large block of shares, held for more than thirty years in trust by a Dutch syndicate or administration office against its own certificates, good to bearer, which are

widely scattered among hundreds of owners, the average holding of the remaining proprietors registered on the books of the company is less than 75½ shares. In the United States the average is little over 70½ shares. All told, the books show 8 holdings of 5,000 shares or over; 51 of 1,000 shares or over; 80 of 500 shares or over; 631 of less than 500 but more than 100 shares; 391 of exactly 100 shares each, and 5,170 of less than 100 shares. The number of stockholders registered on the books of the company is 6,331. Barely one-eighth of them own 100 shares apiece.

On the first day of each month the company quotes to employes, through the heads of their department, a price at which their applications will be accepted for the purchase of Illinois Central shares during that month. An employe is offered the privilege of subscribing for one share at a time, payable by installments in sums of \$5, or any multiple of \$5, on the completion of which the company will deliver to him a certificate of the share registered in his name on the books of the company. He can then, if he wishes, begin the purchase of another share on the installment plan. The certificate of stock is transferable on the company's books, and entitles the owner to such dividends as may be declared by the board of directors, and to a vote in their election.

Any officer or employe making payments on this plan will be entitled to receive interest on his deposits, at the rate of 4 per cent per annum, during the time he is paying for his share of stock, provided he does not allow twelve consecutive months to elapse without making any payment, at the expiration of which period interest will cease to accrue, and the sum at his credit will be returned to him on his application therefor.

Any officer or employe making payments on the foregoing plan, and for any reason desiring to discontinue them, can have his money returned to him with accrued interest, by making application to the head of the department in which he is employed.

An employe, who has made application for a share of stock on the installment plan, is expected to make the first payment from the first wages which may be due him. Forms are provided for the purpose, on which the subscribing employe authorizes the local treasurer in Chicago, or the local treasurer in New Orleans, or the paymaster or the assistant paymaster to

retain from his wages the amount of installment to be credited monthly to the employe for the purchase of a share of stock.

In case an employe leaves the service of the company from any cause, he must then either pay in full for the share for which he has subscribed and received a certificate therefor, or take his money with the interest which has accrued.

The foregoing does not preclude the purchase of shares of stock for cash. An employe who has not already an outstanding application for a share of stock on the installment plan, which is not fully paid for, can in any given month make application for a share of stock for cash at the price quoted to employes for that month, and he can in the same month, if he so desires, make application for another share on the installment plan.

Employes who want to purchase more than one share at a time for cash must address the vice-president in Chicago, who will obtain for them from the New York office a price at which the stock can be purchased.

Any employe desiring to purchase stock (except in special purchase of more than one share for cash) must apply to his immediate superior officer, or to one of the local treasurers, or to the traveling agent.

The system tends to bring the employer and the employe in closer affiliation. It also gives those employed in the service a direct, personal interest in the profits and in the control of the corporation; affords them a safe investment at a fair rate of interest for their savings when deposited in very small sums. This replaces, to a certain extent, the lack of savings banks, which do not exist in the rural districts in the south and west as they do in New York and New England.

To the corporation, the advantage lies in having a resident ownership of stock, and that ownership in the hands of those upon whom it must always rely for the safe and economical despatch of its business.

That the public in the territory served by the railroads named above will benefit by this, goes without saying.

MANUAL TRAINING SCHOOLS.

The law regulating the office of the commissioner of labor statistics requires that the commissioner shall include in his report what progress has been made with the schools now in

operation for the instruction of students in the mechanic arts, and what systems have been found most practical thereof.

So far as known, there are but two cities in the state where manual training is taught, namely, West Des Moines and Mason City. Following will be found extracts from the report of Mr. A. C. Newell, instructor in the West Des Moines schools:

No radical changes have taken place in the manual training department of the West Des Moines schools in the last two years, but the facilities for teaching have been considerably increased, consequently more and better work has been accomplished. Two years ago eighteen new benches were purchased at an expense of about \$125. New tools to the value of \$50 were added to the equipment of the department. This was done to enable the instructor to handle larger classes.

Manual training in the West Des Moines schools is an elective subject, and is usually taken the first two years of the course. In the high school the work is arranged as follows:

FIRST YEAR'S WORK.

Mechanical drawing, 45 minutes per day. This course consists in the use of instruments in making simple geometric and working drawings; the study of orthographic projections, and practice in making drawings showing the intersection and development of the surfaces of objects. The pupils are taught to make simple letters and figures, and a title plate in which several styles of letters are used is also required.

Wood joinery, 45 minutes per day. The object of this course is to teach the use of tools. Part of the exercises used are given for practice, and are followed by constructed objects which are complete and useful articles when finished.

SECOND YEAR'S WORK.

Mechanical drawing, 45 minutes per day; machine design; tracing and blue print making; isometric and oblique projection.

Wood carving, 45 minutes per day for six months (following carving); exercises in center turning. In these exercises the pupils are taught the correct methods of using the common carving tools; inside and outside turning on the face plate; turning of goblets, spheres, towel rings, napkin rings, plates, boxes, etc.; constructed exercise from design, as a stool, stand or table; use of oils, stains, shellac and varnish in finishing woods; inlaying on the face plate; exercises in gluing and turning glued pieces; study of the growth of timber, and the use and strength of different kinds of wood.

THIRD YEAR'S WORK.

Mechanical drawing, 45 minutes per day; shades and shadows of objects drawn in orthographic projection; perspective; drawing of objects in parallel and oblique perspective; shades and shadows of objects drawn in perspective; intersection of surfaces; drawing of buildings in perspective; use of water colors.

The number of pupils taking manual training is increasing, and the pupils and patrons of the high school more fully appreciate the value of the



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department each year. At the present time pupils must choose between manual training and Latin the first year, and persons choosing to have four years of Latin must take that subject as soon as they enter the high school. Quite a number of pupils have asked to take both manual training and Latin during their freshman year, and leave one of the other first studies until later in the course. This has not been allowed in the past, but it is hoped may be arranged for in the future. Such a plan would be appreciated by quite a number of pupils, and probably would considerably increase the enrollment in the manual training department. The greatest objection to such an arrangement is that it is feared that it would complicate the program.

Most of the pupils taking industrial training come to the manual training teacher twice a day, once for drawing and once for wood work, there being a total enrollment of ninety-six.

The "Sloyd" or manual training for the grades, which was introduced three years ago, has proved to be much more of a success during the past year than ever before, and the results of the work are encouraging.

The manual training movement is comparatively new, and it has had to fight against all the forces of conservatism among educators, and also to show the thinking taxpayers that it belongs in the schools as a branch of education. The fact that it has safely run the gauntlet of opposition and criticism is a pretty sure guarantee of its excellence. The parents of pupils who have taken manual training speak enthusiastically in its praise and say that it tends to make better citizens. It tends to give a broader education and so will make better physicians, better clergymen, better lawyers, better teachers, better and more intelligent artisans, and more capable and generous employers.

We are living in an age of great industrial activity. Between the years of 1850 and 1880 our manufactured products increased in value 550 per cent, and the number of persons employed increased 325 per cent. Most of the articles for household use that were once made at home by members of the family are now made in large factories, and as a result of this the children miss the valuable training at home that they once had. If children are not taught to work with their hands while they are young they are apt to have a false idea of the value and dignity of manual labor. The manual training schools of the present day naturally aid in preparing the boys and girls for the busy industrial life they are soon to enter. Quite a number of girls take the manual training work each year. Mental training is obtained by teaching the hand and eye to do that which the brain directs, just as mental training is obtained by developing the memory and reasoning powers by the study of history and mathematics. Manual training is valuable to the girls for many reasons. Probably the most noticeable effect is that it makes them much more reliant.

During school hours classes from the high school have occupied most of the time; and since the "Sloyd" system was introduced into the grades considerable time has been given after school hours, four times a week, to this work.

MANUAL TRAINING AT MASON CITY.

The manual training department in the public schools at Mason City continues to grow in favor with the pupils and the public. There were enrolled 150 boys, from the seventh to the twelfth grades.

The department has been strengthened by improving the architectural and mechanical drawing. The equipment has been greatly enhanced by the introduction of a machine saw, turning lathe and electric motor.

The boys grow to be accurate, independent and thoughtful. Accurate drawings of all constructive work are made before any exercise is made in wood. The boys learn to read and appreciate the value of working-drawings. The aim is to make the work strictly educational, and the skill in drawing and use of tools merely incidental.

The precision, planning and independent execution become a part of every school exercise. Teachers of other parts of the school work comment on the increased power and independence of the boys in preparation of the regular lessons of the school.

LABOR ORGANIZATIONS.

During the extremely hard times the past few years the labor organizations throughout the state suffered to a very great extent, both from a numerical and financial standpoint. Some found it necessary to absolutely disband, others to curtail expenses in various ways and to amend their laws to the existing conditions. The past year has shown that they have come out of the fire with almost all of the dross swept away, and to-day are stronger and better than ever.

There are more and better organizations in the state now than ever before. Better judgment and care is being administered in the laws by which they are governed. They are more anxious than ever that all difficulties shall be settled by any other means than the strike.

Almost every person belonging to a laboring organization regrets very much to resort to the very last possible means to settle a grievance or misunderstanding—the strike. In the selection of committees to handle all grievances and difficulties more care is taken than ever before.

In three cities of the state steps are being taken by which the labor organizations hope in the near future to build and own their hall, equipped with all modern improvements, including gymnasium, baths, library and reading rooms, and to make the place one of constant enjoyment and pride to their membership. This it is believed will add very materially to their enrollment and be a source of instruction and enlightenment to all laboring people who may care to take advantage of it.

According to press reports, Labor day the past year was more generally observed than in any previous year since its inauguration. This is as it should be, and every person who labors should make an extra effort to make this day what its name implies—Labor's day.

REPORTS BY COUNTIES.

In the following tables there will be found the reports by counties of the various individuals, companies, firms and corporations, who employ five or more persons, as required by law. It will be noticed that there is a wide difference in the number reporting in the various years, but this is accounted for by some institutions going out of business, some being reorganized and new books opened, and the records of previous years not being available, it was impossible to secure a report; and again new firms and individuals began business in one year and did not do business the year previous, therefore, could not report for the one year; then again, firms that report for the one year refuse or neglect to report the next; and *vice versa*, and for various other reasons too numerous to mention.

In the recapitulation for the entire state will be found a comparison of the years 1896, 1897 and 1898, which shows that there were in 1896, 1,752 firms reporting, in 1897, 1,311 and in 1898, 1,625. There were in 1896, 40,854 men, 7,732 women and 687 apprentices; in 1897, 40,127 men, 7,696 women and 532 apprentices; in 1898, 45,006 men, 9,800 women and 623 apprentices. Wages paid out in 1896, were \$17,369,622; in 1897, \$17,656,724; in 1898, \$19,623,892. The average time employed during the year 1896, forty weeks full time with full force, eight weeks short time with reduced force, and four weeks suspended. In 1897, forty-four weeks full time with full force, five weeks short time with reduced force, and three weeks suspended. In 1898, forty-five weeks full time with full force, four weeks reduced force, and three weeks suspended.

It will be readily understood that this is but a partial report of the business of Iowa institutions, as none but those who employ five or more persons are included herein. There are thousands of institutions in the state that employ less than five, of which this office can make no record whatever. The law ought to be amended so as to read, three or more, therefore making a much more comprehensive showing for the state, or better still, all

BUENA VISTA COUNTY.

Line No.	KIND OF BUSINESS.	NO. EMPLOYED, 1897.		NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.			
		No. reporting, 1897.	No. reporting, 1898.	Males.	Females.	Apprentices.			Males.	Females.	Apprentices.	Full time, full force.	Short time, reduced force.	Suspended.	Full time, full force.	Short time, reduced force.	Suspended.
1	General merchandise.....	2	2	14	1	12	2	\$ 5,053	\$ 5,290	52			52		
2	Hotel.....	1	1	2	6			1,752		52			52		
	Total.....	3	3	16	7	12	2	6,805	5,290	52			52		
	Average.....														

CARROLL COUNTY.

1	Hotels.....	2	2	10	15	10	16	\$ 5,057	\$ 4,835	52			52		
2	Wholesale groceries.....	1	1	9	1			11,350		52					
	Total.....	2	3	19	16	10	16	16,407	5,835	52			52		
	Average.....														

CASS COUNTY.

1	Canning factory.....	1	1	100	40	270	130	\$ 10,000	\$ 20,000	10	16	26	11	15	26
2	Dry goods, retail, and groceries.....	1	1	8	6	8	4	3,511	5,400	52			52		
3	General merchandise.....	1	1	6	1	6	1	3,200	2,820	52			52		
4	Hotels.....	1	8			13	21		5,748				52		
5	Repairs and structural works.....	1	1	5				486		9	4	30			
6	Tailoring.....	1	1	7	2	7	2	4,700	3,750	32	20		52		
7	Printing, publishing and binding.....	2	2	11	2	16	1	5,694	6,871	52			52		
	Total.....	7	9	137	51	320	150	27,391	44,589	36	7	9	47	2	3
	Average.....														

CEDAR COUNTY.

1	Brick and tile.....	1	1	8		9		\$ 1,500	\$ 1,550	24	2	26	30		22
2	Lime manufacturing.....	1	1	12				4,235		40		12			
3	Stone quarries.....	1	1	110				43,886		30		30			
	Total.....	3	3	130		9		48,601	1,550	30	2	30	30		22
	Average.....														

CERRO GORDO COUNTY.

1	Bottling temperance drinks.....	1	1	5				1,797		32	20				
2	Brick and tile manufactory.....	1	1	36		43		13,821	20,323	33	12	7	52		
3	Contractor and builder.....	1	1			17		7,548					37		15
4	Dry goods and millinery, retail.....	3	2	11	21	3	6	14	2	52			52		
5	Electric light and power.....	1	1	8	2	17	3		5,484	6,364	52		52		
6	General merchandise.....	1	1	5				565		26		26			
7	Hotels.....	1	5	6	9	21	38		3,838	10,205	52		52		
8	Laundries.....	2	2	15	23	14	26		11,706	8,509	52		52		
9	Machine shop and foundry.....	1	1	8				1,650		52			52		
10	Printing and publishing.....	1	2	6	3	10	11		3,000	6,120	52		52		
11	Wholesale butter and eggs.....	1	1	8		7		4,747	3,875	52			52		
12	Wholesale and retail coal.....	1	1			6			3,033				52		
13	Wholesale groceries.....	1	1	30	4	28	5		21,000	14,000	52		52		
14	Wholesale and retail lumber and ice.....	1	1			6			2,000				52		
	Total.....	15	18	138	62	4	174	97	2	\$ 78,283	\$ 89,339	47	3	2	51
	Average.....														

CHEROKEE COUNTY.

1	Brick and tile.....	1	1	15		25		\$ 1,200	\$ 1,167	12		40	6	4	42
2	Hotels.....	2	2	2	13	1	3	12		3,200			52		
	Total.....	3	3	17	13	1	28	12		4,400			52		42
	Average.....														

CHICKASAW COUNTY.

1	Hotel.....	1	1	2	7	2	7	\$ 1,584	\$ 1,584	52			52		
	Total.....	1	1	2	7	2	7	1,584	1,584	52			52		
	Average.....														

CLARKE COUNTY.

1	Hotel.....	1	1	4	6	5	4	\$ 2,000	\$ 1,862	52			52		
	Total.....	1	1	4	6	5	4	2,000	1,862	52			52		
	Average.....														

CLAY COUNTY.

1	Grain, hay and live stock.....	1	1	52	1	50	2	\$ 27,720	\$ 27,670	52			52		
2	Hotel.....	1	1	4	10	3	11		2,280				52		
	Total.....	2	2	56	11	53	13	29,940	29,950	52			52		
	Average.....														

CLAYTON COUNTY.

Line No.	KIND OF BUSINESS.	NO. REPORTING,		NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.		
		1897.	1898.	Males.	Females.	Apprentices.	Males.	Females.	Apprentices.			Full time, full force.	Short time, reduced force.	Suspended.	Full time, full force.	Short time, reduced force.	Suspended.
1	Brick manufacturer.....	1	1	8			10			\$ 1,231	\$ 1,568	26			26		
2	Merchandise and lumber.....	1	1	7			5			375	400	24			24		
3	Newspaper and binding.....	1	1	3	3		4	3		1,404	1,200	52			52		
4	Saw mill and wholesale lumber.....	1	1	125			122			30,000	32,277	28	18		29	23	
	Total.....	4	4	146	3		141	3		\$ 33,010	\$ 35,445				32	6	14
	Average.....											27	7	18	32	6	14

CLINTON COUNTY.

1	Beer manufacturer.....	1	1	10			11			\$ 6,985	\$ 7,373	52			52		
2	Boilers and sheet iron.....	1	1	30		4	20		5	9,000	8,000	52			26	26	
3	Box, crate and shooek manufactories.....	3	3	108			155			30,026	37,280	48	4		48	1	
4	Clothing, shoes and furnishings.....	2	2	14	2		14	2		10,080	10,575	52			52		
5	Coal, wood and ice.....	2	1	11			6			5,626	3,250	52			52		
6	Confectionery and ice cream.....	1	1	3	3		4	3		928	1,078	52			52		
7	Crackers and cakes.....	1	1	17	12		16	12		14,607	14,966	46		6	50		
8	Dry goods and carpets.....	3	3	23	36	3	25	34	5	23,700	28,996	46		6	52		
9	Foundry and machine works.....	2	2	81			156			35,40	50,492	52			52		
10	Furniture manufactories.....	3	3	146	4		139	5	15	40,332	43,979	40	10	2	23	28	1
11	Gas and electric light.....	1	1	20	1		24	1		13,000	14,000	62			62		
12	General merchandise.....	1	1	5	3	1	13	9	4	3,600	8,600	52			52		
13	Harness and neckyoke manufactory.....	1	1	23		7	30			8,921	10,067	40	12		44	8	
14	Hotels.....	2	2	15	21		14	21		5,892	6,721	52			52		
15	Kindling wood factory.....	1	1	18	2		18			2,000	2,547	13	31	8	13	31	8
16	Laundry.....	1	1	5	16		5	16		5,500	7,500	52			52		
17	Lumber, sash, doors and blinds.....	4	4	1,288	2		1,343	3		423,368	414,956	23	21	8	24	27	1
18	Merchant tailors.....						6			4,000	2,000	42		10	24	28	
19	Metal cornice factory.....	1	1	6			5		3	1,400	1,225	28	24		25	27	
20	Millinery.....	1	1	7	8		5			3,300	6,980	48	4		50	2	
21	Milling and grain.....	1	1	6	1		13	1		25,479	29,144	52			52		
22	Newspaper, printing and binding.....	3	3	34	13	5	33	14	6	11,357	6,000	30	22		52		
23	Paper manufactory.....	1	1	19	4		17	3		11,357	6,000	30	22		52		
24	Street railway.....	1	1	30			20			11,400	11,099	52			52		
25	Telephone exchange.....	1	1	4	8		6	8		5,000	5,000	52			52		
26	Wholesale crockery and glassware.....	1	1	8	2		13	3		4,600	5,100	50	2		52		
27	Wholesale drugs.....	1	1	26			27			35,440	38,477	52			52		
28	Wholesale fruits.....	1	1	5			5			2,547	2,496	52			52		
29	Wholesale groceries.....	1	1	8			9			11,248	11,819	52			52		
30	Wholesale and retail hardware, plumbing and heating.....	2	2	20	2		26	2		11,794	13,750	52			52		
31	Wholesale tobacco.....	1	1	7			7			6,000		34	18				
	Total.....	46	44	1,997	139	20	2,171	137	38	\$ 770,313	\$ 793,470	46	4	2	50	2	
	Average.....																

CRAWFORD COUNTY.

1	Brick manufactory.....	1	1	10			11			\$ 2,000	\$ 2,475	26			26		20
2	Hotel.....	1	1	2	6		2	7		1,616	1,800	52			52		
	Total.....	2	2	12	6		13	7		\$ 3,616	\$ 4,275						
	Average.....											39		13	42		10

DALLAS COUNTY.

1	Brick manufactories.....	4	3	45			40			\$ 10,709	\$ 6,677	27	10	15	12	16	24
2	Milling and grain.....	2	2	12			12			6,000	6,772	30	17	5	40	10	2
3	Printing and publishing.....	1		3	2					2,002		52					
4	Retail coal and mining.....	1	1	20			17			8,886	8,886	6	46		5	47	
	Total.....	8	6	80	2		69			\$ 27,597	\$ 22,335	28	17	5	19	21	12
	Average.....																

DELAWARE COUNTY.

1	Carriage factory.....	1	1	15			21	3		\$ 5,310	\$ 7,000	52			35	17	
2	Cigar manufactory.....	1	1	6	2		8	2		3,900	3,200	52			49		3
3	Manufactory of woolen goods.....	1	1	7	7		7	7		3,100	3,100	36	15		38		14
	Total.....	3	3	28	9		36	12		\$ 12,310	\$ 13,300	46	6		41	5	6
	Average.....																

DES MOINES COUNTY.

Line No.	KIND OF BUSINESS.	NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.		
		No. reporting.	No. reporting, 1898.	Males.	Females.	Apprentices.	Males.			Females.	Apprentices.	Full time, full force.	Short time, reduced force.	Suspended.	Full time, full force.	Short time, reduced force.	Suspended.
1	Barrel manufactory.....	1	1	7				\$ 2,548		10	43				
2	Basket manufactory.....	1	1	6			40	40	3,000				40	6	6
3	Brewing beer.....	1	1	8			8	8	1,500				33		
4	Box manufactories (paper).....	1	2	6	10		5	11	1,500				53		
5	Brick manufactories.....	1	2	40			75		10,736				26,559	40	13
6	Broom manufactory.....	1	1	16			12		5,000				50		
7	Burial case manufactories.....	2	1	7	52		30	8	33,969				12,334	14	4
8	Carpenter and builder.....	1	1	22			7		7,000				1,500	29	10
9	Carpets, wall paper and curtains.....	1	1	14			3		10,450				52		
10	Cigar factories.....	2	3	46	12		50	17	20,500				34,500	52	
11	Clothiers and tailors.....	1	4	38			56	1	29,000				21,597	52	7
12	Confectioners and jobbers.....	1	1	16			30	8	12,126				9,300	40	10
13	Cooperage.....	1	1	15			18	2	8,600				6,000	36	14
14	Dry goods and notions.....	3	3	40	25		41	26	30,427				29,968	52	4
15	Drugs, retail.....	1	1	14			2		3,340				3,444	52	6
16	Foundry, machine and boiler shops.....	1	1	340			284	28	112,143				128,037	52	6
17	Furniture and crockery, retail.....	1	1	45			18	4	3,200				12,234	52	5
18	Furniture manufactory.....	1	1	19			30	8	12,070				13,588	52	6
19	Gas and electric light.....	1	2	48			107	1	15,450				53,473	52	2
20	Hotel and restaurants.....	1	1	3	5		6		5,000				31,184	52	30
21	House painting.....	1	1	11			6		3,002				3,002	52	3
22	Laundries.....	2	2	12	18		10	20	8,964				9,360	50	2
23	Livery and transfer.....	1	1	20			15		6,100				5,248	40	12
24	Lined oil manufactory.....	1	1	17			20		12,605				13,068	52	1
25	Manufactory of flour and feed.....	1	1	20			30	30	17,500				7,007	39	13
26	Manufactory of crackers and candies.....	1	1	20			14	4	9,022				7,007	39	24
27	Manufactory of school furniture.....	1	1	22	13		6	16	35,356				78,501	52	6
28	Printers, publishers and binders.....	4	7	92	13		131	14	6,327				16,322	36	16
29	Plumbing and heating.....	1	1	14			1	15	8,606				9,598	52	3
30	Pork packer.....	1	1	1			1		8,606				9,598	52	3
31	Sash, doors, blinds, wholesale and retail.....	5	5	639	4		534	1	168,733				188,670	41	11
32	Shap manufactory.....	1	1	16			20	5	9,224				9,224	45	4
33	Shirts and overalls manufactory.....	1	1	4	42		5	38	8,085				9,569	31	21
34	Shoe manufactory.....	1	1	6	8		4	3	2,800				2,615	52	28
35	Telephone exchange.....	1	1	15	6		4	7	5,679				4,534	52	28
Total.....		68	66	2,030	244	41	3,414	348	108	\$ 923,974			\$ 1,136,366	48	3
Average.....															

DICKINSON COUNTY.

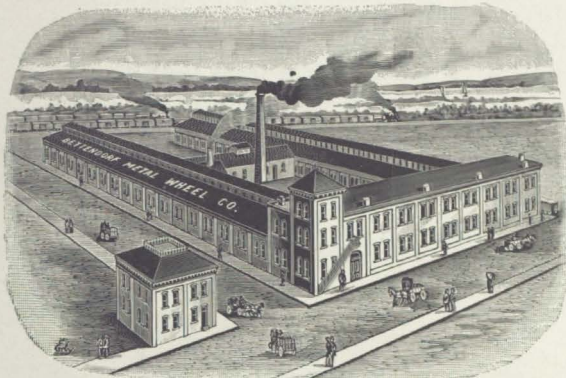
1	Hotel.....	1	1	78	15				\$ 5,018				8	6	38
Total.....		1	1	78	15				\$ 5,018				8	6	38
Average.....															

DUBUQUE COUNTY.

1	Bakery.....	1	2	15			27	3	\$ 7,600	\$ 12,500	52		52			
2	Baskets and lye manufactory.....	1	1	47	3		22	3	4,220	3,245	24	21	7	48	4	
3	Beer manufactory.....	1	1	76			85		54,203	53,000	52		52			
4	Box (paper) manufactory.....	1	1	3			1		1,224		52		52			
5	Blacksmith and shoeling.....	1	1	5			5		5,225		52		52			
6	Books, stationery, etc, retail.....	1	1	8			7	1	3,500	3,500	52		52			
7	Books, stationery, etc, wholesale.....	1	1	17			19	1	12,500	11,500	52		52			
8	Brass goods manufactory.....	1	1	60			14		5,000	7,963	12		40	52		
9	Brick manufactories.....	3	3	37			48		9,108	9,054	26		26	39	26	
10	Broom manufactory.....	1	1	16			2	6	6,512	7,300	38	14	34	18	26	
11	Cigar and tobacco manuf'ries, jobbers.....	2	2	6	45		5	70	11	19,785	22,672	46		6	51	1
12	Cigar and tobacco manuf'ries, wholesalers.....	2	2	28	9		29	11	26,682	28,754	52		52			
13	Clothing, retail.....	1	1	11			6	2	4,540	6,000	52		52			
14	Clothing manufactories.....	4	3	152	597		143	653	180,128	192,658	51		1	52		
15	Coffin and casket manufactories.....	2	2	107	16		4	123	17	44,919	51		1	52		
16	Cooperage manufactory.....	1	1	20			4	26	7,945	8,000	52	48	6	46	4	

DUBUQUE COUNTY—CONTINUED.

Line No.	KIND OF BUSINESS.	NO. EMPLOYED, 1897.		NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.					
		No. reporting, 1897.	No. reporting, 1898.	NO. EMPLOYED, 1897.					NO. EMPLOYED, 1898.			Fulltime, full force.	Shorttime, reduced force.	Suspended.	Fulltime, full force.	Shorttime, reduced force.	Suspended.
				Males.	Females.	Apprentices.			Males.	Females.	Apprentices.						
17	Confectionery manufactory	1	1	20	30	20	30	10,000	10,000	48	4	50	50	47	2		
18	Cracker manufactory	1	1	18	6	20	8	7,376	14,107	6	46	52	52	47	2		
19	Crockery, retail and wholesale	1	1	15	3	17	3	8,750	10,500	52	52	52	52	52	2		
20	Drugs, retail and wholesale	1	1	16	2	17	2	12,896	13,906	52	52	52	52	52	2		
21	Dry goods, retail and wholesale	6	8	66	78	69	108	44,522	55,752	52	52	52	52	52	2		
22	Foundry and machine shops	3	3	111	5	36	1	48,870	13,826	35	17	38	38	14	2		
23	Furniture manufactories	2	2	88	85	85	1	28,348	31,409	41	6	52	52	52	2		
24	Gas manufactory	1	1	14	21	21	1	8,728	13,000	52	52	52	52	52	2		
25	Groceries, retail	1	1	15	4	5	1	7,820	2,004	52	52	52	52	52	2		
26	Harness and saddlery manufactory	1	1	8	2	13	2	2,000	4,250	52	52	52	52	52	2		
27	Hotels	4	4	49	73	48	73	30,349	28,824	52	52	52	52	52	2		
28	Laundries	3	3	8	24	6	15	9,417	5,484	52	52	52	52	52	2		
29	Linseed oil manufactory	1	1	20	20	20	1	7,585	7,342	45	7	40	40	13	2		
30	Lime manufactory	1	1	9	13	13	1	3,800	3,600	40	12	32	32	20	2		
31	Livery and transfer lines	3	2	60	12	26,969	13,944	52	52	52	52	52	52	52	2		
32	Mattresses, spring beds, etc	1	1	26	5	31	6	11,448	13,000	38	14	44	44	8	2		
33	Merchant tailors	3	3	25	4	22	5	12,450	12,500	52	52	52	52	52	2		
34	Milling and flour	2	2	25	137	22	32	11,584	106,514	50	2	52	52	52	2		
35	Newspaper printing and publishing	8	8	198	20	137	22	78,982	35,000	52	52	52	52	52	2		
36	Novelty iron and hardware manufactory	1	1	35	76	4	2	12,544	19,450	50	2	52	52	52	2		
37	Plumbing and heating	1	1	12	5	40	1	7,941	19,450	52	52	52	52	52	2		
38	Pumps (iron and wood, gas and water pipe)	1	1	149	1	208	2	57,142	72,710	26	26	35	35	17	2		
39	Sash, door and blind manufactories	2	2	449	475	133,850	183,091	36	16	36	16	35	35	14	3		
40	Stoves, tinware and furnaces	1	1	5	11	4	2,683	5,104	50	2	26	26	26	2			
41	Soap manufactory	1	1	12	6	5	2,000	2,000	25	9	52	52	52	2			
42	Soda water manufactory	1	1	4	1	24	12	13,020	13,000	41	11	39	39	13	2		
43	Shoe manufactories	1	1	44	22	15	1	17,296	13,000	52	52	50	50	2	2		
44	Shoes and boots, wholesale	2	2	24	1	17,296	13,000	52	52	52	52	52	52	52	2		
45	Steam boiler manufactory	1	1	5	2,700	48	4	2,700	33,539	52	52	52	52	52	2		
46	Street railway, electric light and power	3	2	73	1	64	1	40,222	5,500	52	52	52	52	52	2		
47	Telephone exchange	1	1	4	12	3	4,400	7,664	52	52	52	52	52	2			
48	Vinegar and pickle manufactory	1	1	9	1	8	1	7,664	5,899	52	52	52	52	52	2		
49	Wagon and carriage manufactories	5	5	472	9	424	4	64,602	103,596	48	4	48	48	4	2		
50	Water works	1	1	20	13	9,000	11,800	52	52	52	52	52	52	52	2		
51	Wall paper and painting	1	1	15	1	25	1	11,410	9,902	41	11	25	25	17	2		



Bettendorf Metal Wheel Co., Davenport.
The only exclusive metal wheel manufacturers in Iowa.

52 Wholesale fruits and produce.....	2	1	17	3	18	2	12,200	16,650	52	.....	52	.....			
53 Wholesale groceries.....	3	3	69	9	69	7	84,690	79,597	52	.....	52	.....			
54 Wholesale hardware.....	3	2	65	9	24	3	54,281	21,834	52	.....	52	.....			
55 Wholesale liquor.....	1	2	7	.....	12	.....	4,680	7,566	52	.....	52	.....			
56 Wholesale meats.....	1	1	6	.....	5	.....	3,800	3,190	52	.....	52	.....			
57 Wholesale rubber goods.....	1	1	8	.....	6	.....	6,883	5,067	52	.....	52	.....			
58 Wholesale spices and coffee.....	1	1	12	.....	16	.....	7,431	12,929	52	.....	52	.....			
59 Wholesale and retail lumber.....	5	5	615	2	513	3	189,040	184,457	40	13	31	19				
60 Wholesale wire works.....	1	1	6	.....	5	.....	3,000	2,400	52	.....	52	.....			
61 Wood, coal and ice.....	.....	2	.....	.....	37	.....	.....	20,180	.....	.....	52	.....			
Total.....	109	104	3,306	997	51	3,169	1116	63	\$ 1,532,168	\$ 1,779,768	49	2	1	49	2	1
Average.....

EMMET COUNTY.

1 Fence manufactory.....	.....	1	.....	.....	8	.....	.....	\$ 1,370	.....	.....	26	26
2 General merchandise.....	.....	1	.....	.....	3	2	.....	3,250	.....	.....	52	.....
3 General produce, wholesale.....	.....	1	.....	.....	7	1	.....	3,125	.....	.....	52	.....
4 Hardware, retail.....	.....	1	.....	.....	.....	.....	.....	2,940	.....	.....	52	.....
5 Hotel.....	1	.....	3	8	.....	.....	\$ 1,800	.....	52	.....	.....	.....
6 Laundry.....	.....	1	.....	.....	2	4	.....	1,100	.....	.....	52	.....
Total.....	1	5	3	8	25	7	\$ 1,800	\$ 10,185	52	.....	47	5
Average.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

FAYETTE COUNTY.

1 Canning vegetables.....	1	1	100	50	125	75	\$ 4,858	7,363	8	.....	44	12	40
2 Hotels.....	3	3	8	17	8	22	5,812	5,464	44	.....	8	44	8
Total.....	4	4	108	67	133	97	\$ 8,671	\$ 10,827	26	.....	26	28	24
Average.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

FLOYD COUNTY.

1 Implement manufactory.....	1	1	8	.....	11	.....	\$ 1,341	2,155	40	8	4	44	8
2 Sash, doors and blinds.....	1	1	14	.....	30	.....	4,606	5,555	40	12	5	38	6
3 Store fixtures and furniture.....	1	1	35	.....	25	.....	11,045	4,800	43	.....	9	26	26
Total.....	3	3	57	.....	66	.....	\$ 16,992	\$ 12,510	42	6	4	36	2
Average.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

FRANKLIN COUNTY.

Line No.	KIND OF BUSINESS.	No. reporting, 1897.		NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.		
		No. reporting, 1897.	No. reporting, 1898.	Males.	Females.	Apprentices.	Males.	Females.	Apprentices.			Full time, full force.	Short time, reduced force.	Suspended.	Full time, full force.	Short time, reduced force.	Suspended.
1	Brick and tile manufactory	1	1	5			5			\$ 975	\$ 1,200	26		26	30		20
2	Hotel	1	1				6	12			2,780				52		
3	Milling and grain	1	1				5			2,488					52		
4	Poultry, wholesale	1	1				20				2,000				37		15
	Total	1	4	5			36	12		\$ 975	\$ 9,468	26		26	43		9
	Average																

FREMONT COUNTY.

1	Brick manufactory	1		6			7			\$ 675	\$ 600	13		39	13		39
	Total	1		6			7			\$ 675	\$ 600	13		39	13		39
	Average																

GREENE COUNTY.

1	Brick and tile manufactory	1	1	26			24			\$ 9,068	\$ 9,466	34	18		40	12	
	Total	1	1	26			24			\$ 9,068	\$ 9,466	34	18		40	12	
	Average																

GRUNDY COUNTY.

1	Hotel	1		2	4		2	4		\$ 1,200	\$ 1,200	52			52		
	Total	1		2	4		2	4		\$ 1,200	\$ 1,200	52			52		
	Average																

GUTHRIE COUNTY.

1	Brick manufactory	3		30						\$ 4,587		33		19			
2	Coal mining	2	2	14			14			4,049	3,014	20		32	18	34	
3	Hotel	1	1	4	4		3	5		1,295	1,138	52			52		
4	Woolen manufactory	1	1	7	5		7	5		2,555	2,285	30		22	26		26
	Total	7	4	55	9		24	10		\$ 12,486	\$ 7,037	32		20	37	9	6
	Average																

HAMILTON COUNTY.

1	Agricultural implement manufactory	1	1	19	1		46	2		\$ 9,400	\$ 13,900	40	10	2	50		2
2	Bakery and confectionery	1	1	3	2		3	2		1,700	1,700	52			52		
3	Brick manufactory	1		40						12,500		32		20			
4	Dry goods, etc.	1	1	2	5		3	5		1,440	2,000	52			52		
5	Heating apparatus manufactory	1	1	16			28			6,183	5,650	32	20		42	10	
6	Hotel	1	1	5	9		5	10		2,904	2,964	52			52		
7	Laundry	1	1	5	25		5	25		6,750	8,000	52			52		
8	Merchant tailor	1	1	10	1		10	1		4,000	4,000	44	8		42	10	
9	Printing and publishing	1	1	8	2	1	8	1		2,500	2,860	52			52		
10	Shoe and boot manufactory	1	1	30	16		28	16		14,021	12,540	21	25	6	10	42	
11	Wholesale grocery	1		9	1					9,660		52					
	Total	11	9	137	60	1	132	61	1	\$ 70,959	\$ 58,614	44	5	3	45	7	
	Average																

HANCOCK COUNTY.

1	Hotel	1	2	1	5		3	11		\$ 900	\$ 2,500	52			52		
2	Machinery, grain and coal	1	1				7			3,250					52		
	Total	1	3	1	5		10	11		\$ 900	\$ 5,750	52			52		
	Average																

HARDIN COUNTY.

1	Bed spring manufactory		1				13	1			\$ 5,000				29	13	
2	Brick and tile manufactories	2	2	22			20			8,500	5,900	20		30	30		22
3	Clothing and furnishings		1				7	1		1,760					22		30
4	Dray and transfer		1				5			2,500					52		
5	Electric light and heat	1	1	5			5			3,480	3,380	52			52		
6	General stores		4				33	7			17,234				52		
7	Hotel	1	3	2	5		7	20		850	5,205				52		
8	Laundry	1	1	4	5		4	6		2,000	2,754				52		
9	Produce, wholesale		1				4	1			1,800				23	26	
10	Real estate and loans		1				7	2			3,467				52		
	Total		5	16	33	10	105	38		\$ 14,830	\$ 48,980			40	12	46	3
	Average																

HARRISON COUNTY.

Line No.	KIND OF BUSINESS.	No. reporting, 1897.		NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.			
				Males.	Females.	Apprentices.	Males.	Females.	Apprentices.			Full time, full force.	Shorttime, reduced force.	Suspended.	Full time, full force.	Shorttime, reduced force.	Suspended.	
1	Brick manufactories	2	2	11	10	\$ 1,357	\$ 2,395	16	36	16	36
2	Printing and publishing	1	1	8	1	1	7	1	.....	3,000	1,750	52	.....	.....	52	.....	.....
3	Hotel and eating house	1	1	11	14	.....	11	14	.....	6,630	6,630	52	.....	.....	52	.....	.....
	Total	4	4	30	15	1	28	15	.....	\$ 10,987	\$ 10,705	34	.....	18	34	.....	18
	Average																	

HENRY COUNTY.

1	Brick and tile manufactory	1	1	7	.....	.....	10	.....	.....	\$ 1,604	\$ 2,000	16	16	20	26	13	13
2	Dry goods, millinery and carpets	1	1	4	4	2	4	5	1	3,280	3,700	52	.....	.....	52	.....	.....
3	Hotel	1	1	2	6	.....	3	7	.....	1,560	1,560	52	.....	.....	52	.....	.....
4	Milling and grain	1	1	15	1	.....	12	1	.....	3,993	4,537	34	18	.....	52	.....	.....
5	Newspaper printing and binding	2	2	14	2	2	12	3	1	4,378	4,378	52	.....	.....	52	.....	.....
6	Planing mill and lumber	1	1	11	.....	.....	11	.....	.....	4,500	5,000	44	8	.....	20	24	8
	Total	7	7	53	13	4	52	16	2	\$ 19,315	\$ 21,175	42	6	4	44	5	3
	Average																

HOWARD COUNTY.

1	Blacksmith, wood and repair shop	1	.....	6	.....	2	.....	.....	.....	\$ 2,700	.....	24	26	2	.....	.....	.....
2	Hotel	1	1	2	8	.....	2	8	.....	1,748	\$ 1,600	52	.....	.....	52	.....	.....
	Total	2	1	8	8	2	2	8	.....	\$ 4,448	\$ 1,600	38	13	1	52	.....	.....
	Average																

IDA COUNTY.

1	Hotel	1	1	3	4	.....	4	4	.....	\$ 1,200	\$ 1,500	52	.....	.....	52	.....	.....
2	Laundry	1	1	3	3	.....	3	3	.....	1,400	1,400	52	.....	.....	52	.....	.....
	Total	2	2	6	7	.....	7	7	.....	\$ 2,600	\$ 2,900	52	.....	.....	52	.....	.....
	Average																

IOWA COUNTY.

1	Brick and tile manufactories	2	2	20	.....	.....	25	.....	.....	\$ 5,300	\$ 6,900	38	.....	14	31	.....	21
2	Dry goods	1	1	3	1	1	4	1	.....	2,500	2,625	52	.....	.....	52	.....	.....
3	Hotel	1	.....	4	.....	.....	.....	.....	.....	1,024	.....	52	.....	.....	.....	.....	.....
	Total	4	3	27	5	1	29	1	.....	\$ 8,824	\$ 9,525	38	.....	14	40	.....	12
	Average																

JACKSON COUNTY.

1	Barrels and butter tubs	2	2	21	1	.....	14	1	.....	\$ 6,236	\$ 5,024	31	15	6	32	5	15
2	Brick and tile manufactory	1	1	6	.....	.....	9	.....	.....	925	.....	20	32	.....	22	.....	23
3	Cigar manufactories and wholesalers	1	2	10	2	.....	11	2	.....	7,841	5,845	50	.....	2	50	.....	2
4	Hotel	1	1	8	6	.....	5	5	.....	936	2,000	52	.....	.....	52	.....	.....
5	Lime manufactories	2	2	82	.....	.....	87	.....	.....	24,280	23,500	38	4	10	36	6	10
6	Saw mill and lumber	1	1	100	.....	.....	.....	.....	.....	60,000	.....	52	.....	.....	.....	.....	.....
7	Woolen mill	1	1	14	4	.....	13	5	.....	2,856	2,856	26	.....	26	36	.....	16
	Total	7	10	241	13	.....	130	13	.....	\$ 108,074	\$ 39,225	39	7	6	43	2	7
	Average																

JASPER COUNTY.

1	Agricultural implements	2	2	30	1	.....	65	.....	.....	\$ 12,888	\$ 26,057	23	10	19	38	12	2
2	Brick manufactory	1	1	7	.....	.....	9	.....	.....	1,000	1,350	18	6	28	22	2	23
3	Clothing manufactory	1	1	10	65	.....	12	45	.....	13,200	10,445	52	.....	.....	30	22	.....
4	Coal mining	1	1	250	.....	.....	210	.....	.....	15,253	133,642	24	28	.....	40	12	.....
5	Dry goods, retail	1	1	3	2	.....	3	2	.....	2,000	2,100	52	.....	.....	52	.....	.....
6	Foundry, machine shop and planing mill	1	1	10	.....	.....	10	.....	.....	4,500	4,500	32	20	.....	30	22	.....
7	Hotel	3	3	12	28	.....	17	23	.....	8,768	8,744	52	.....	.....	52	.....	.....
	Total	10	10	322	96	.....	356	70	.....	\$ 168,609	\$ 186,838	36	9	7	41	7	4
	Average																

JEFFERSON COUNTY.

1	Brick manufactory	1	1	19	.....	.....	19	.....	.....	\$ 2,854	\$ 4,142	14	8	30	27	6	19
2	Cigar manufactory	1	1	5	.....	.....	5	.....	.....	2,400	2,600	52	.....	.....	26	26	.....
3	Dry goods, retail	2	1	7	4	.....	4	2	.....	4,866	2,500	52	.....	.....	52	.....	.....
4	Farm tool manufactory	1	2	17	1	.....	103	2	.....	6,888	29,691	52	.....	.....	52	.....	.....
5	Hotel	1	1	4	10	.....	4	10	.....	1,933	2,014	52	.....	.....	52	.....	.....
6	Laundry	1	1	3	3	.....	2	3	.....	1,380	1,560	52	.....	.....	52	.....	.....
7	Merchant tailors	1	3	5	5	1	11	8	3	5,000	7,820	40	12	.....	48	.....	4
8	Printing and publishing	1	3	6	1	.....	15	5	7	2,860	7,952	52	.....	.....	52	.....	.....
	Total	9	13	66	24	1	163	30	10	\$ 23,181	\$ 58,279	47	2	3	48	2	2
	Average																

JOHNSON COUNTY.

Line No.	KIND OF BUSINESS.	NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.		
		No. reporting, 1897.	No. reporting 1898.	Males.	Females.	Apprentices.	Males.			Females.	Apprentices.	Full time, full force.	Short time, reduced force.	Suspended.	Full time, full force.	Short time, reduced force.	Suspended.
1	Bakery.....	1	1	10	9	4	12	2,560	2,560	52	52	52	52	52	52
2	Brick manufactory....	1	1	10	9	4	12	2,000	2,200	52	52	52	52	52	52
3	Cigar manufactory.....	1	1	5	5	5	5	1,750	1,700	52	52	52	52	52	52
4	Clothing dealer.....	1	1	5	5	5	5	3,120	3,025	52	52	52	52	52	52
5	Contractor and builder.....	1	1	12	12	12	12	4,000	6,000	32	8	12	32	14	6
6	Dry goods, carpets and millinery.....	1	1	7	10	1	5	6,500	1,500	52	52	52	52	52	52
7	Hardware and tinware.....	1	1	7	1	5	1	2,485	2,366	39	13	52	48	52	4
8	Hotels.....	2	2	14	15	10	20	3,832	4,584	52	52	52	52	52	52
19	Laundries.....	3	3	7	8	7	14	4,346	4,558	52	52	52	51	1	52
10	Painting and paper hanging.....	2	1	19	8	20	14	2,246	4,000	26	26	26	26	26	26
11	Printing, publishing and binding.....	3	3	45	6	50	10	12,418	19,686	52	52	52	52	52	52
12	Quarrying stone.....	1	1	11	2	8	5	1,120	7,700	52	52	52	52	52	52
13	Wholesale grocery and bakery.....	1	1	11	2	2	8	7,700	4,436	52	52	52	52	52	52
14	Tanning, glove and mitten manufactory.....	1	1	11	2	2	8	8,500	8,500	52	52	52	52	16	52
	Total.....	17	17	147	41	8	152	67,507	65,415	42	2	8	45	4	3
	Average.....														

JONES COUNTY.

1	Agricultural implement manufactory.....	1	1	8	2	7	2	3,518	2,120	29	23	35	17	10
2	Feather duster manufactory.....	1	1	20	30	40	40	6,608	8,520	52	43	29	18	10
2	Stone quarries.....	2	2	66	79	79	79	15,688	27,518	52	52	52	52	52
	Total.....	4	4	84	30	106	40	25,814	38,158	33	16	3	42	8
	Average.....													

KEOKUK COUNTY.

1	Brick and tile manufactories.....	3	3	24	25	25	25	5,041	5,519	24	1	27	23	6
2	Coal mining.....	5	5	263	295	295	295	126,996	129,986	24	24	4	26	18
3	Hotel.....	1	1	3	3	10	10	1,500	1,450	52	52	52	52	52
4	Mining tool manufactory.....	1	1	12	19	19	19	8,320	10,400	42	10	52	52	52
	Total.....	10	10	302	9	342	10	141,047	147,355	36	8	8	38	6
	Average.....													

KOSSUTH COUNTY.

1	Brick manufactory.....	1	1	5	5	11	11	300	800	8	44	17	35
2	Hotel.....	1	2	2	4	2	6	2,948	2,080	52	52	52	52
3	Laundry.....	1	1	1	12	6	6	6,840	6,840	52	52	52	52
4	Milling and grain.....	1	1	1	1	1	1	300	12,688	8	44	43	9
	Total.....	1	5	5	23	17	17	300	12,688	8	44	43	9
	Average.....												

LEE COUNTY.

1	Agricultural implements mfts. and retail.	3	2	281	267	1	1	63,709	65,000	38	13	1	40	7
2	Bag manufactory.....	1	1	11	15	28	28	9,635	9,723	52	52	52	52	10
3	Bakery.....	1	1	13	15	15	2	6,200	6,600	52	52	52	52	52
4	Breweries.....	2	2	16	15	15	15	7,906	6,020	52	52	52	52	4
5	Boot and shoe manufactories and retail.....	2	2	143	138	50	113	126,996	129,896	51	26	27	25	25
6	Brick manufactory.....	1	1	12	12	12	12	1,975	2,420	26	26	26	26	20
7	Can (tin) factory.....	1	1	60	50	50	50	13,116	19,712	29	23	15	15	16
8	Canning vegetables and pickles.....	3	3	198	167	137	162	21,693	23,623	14	23	30	22	21
9	Carriage manufactory.....	1	1	41	5	1	1	65,828	71,331	52	52	52	52	52
10	Clothing manufactory.....	1	1	11	12	1	1	7,206	7,021	52	52	52	52	6
11	Clothing, retail.....	2	2	41	111	1	1	23,958	37,260	40	11	1	46	6
12	Cooperage manufactories.....	1	1	90	111	2	2	5,500	4,800	52	52	52	52	52
13	Crockery, retail.....	1	1	6	5	15	1	12,050	12,978	52	52	52	52	52
14	Dry goods, retail.....	3	3	13	14	6	1	9,124	12,775	52	52	52	52	52
15	Fire insurance.....	1	1	9	10	6	2	41,595	46,075	47	1	4	42	6
16	Foundry and machine work.....	3	3	76	74	6	2	32,490	28,000	44	8	51	52	1
17	Furniture manufactories.....	1	1	*161	*159	40	7	22,869	21,889	52	52	52	52	52
18	Furniture, retail and carpets.....	2	2	35	40	7	7	6,030	7,320	52	52	52	52	52
19	Gas manufactories.....	2	2	14	14	1	1	3,000	2,500	52	52	52	52	52
20	General merchandise.....	1	1	3	5	20	20	5,460	9,000	32	12	8	49	3
21	Harness and collar manufactory.....	1	1	15	25	5	5	4,000	5,460	52	52	52	52	52
22	Hotels.....	3	3	38	53	49	6	12,889	21,822	52	52	52	52	52
23	Laundries.....	2	2	7	8	13	6	4,800	5,894	52	52	52	52	52
24	Livery and transfer.....	1	1	16	17	4	2	6,700	7,100	52	52	52	52	52
25	Merchant tailoring.....	2	2	15	13	4	2	10,032	10,675	30	22	31	21	20
26	Papering, painting and wall paper.....	3	3	24	19	2	2	7,981	8,073	40	12	40	12	12
27	Printing, publishing and binding.....	5	6	76	88	14	10	38,961	43,632	52	52	52	52	52
28	Proprietary medicine manufactory.....	1	1	175	155	5	2	77,500	77,500	52	52	52	52	52
29	Plumbing and steam heating.....	1	1	10	9	2	2	5,000	6,000	34	18	33	20	7
30	Pork packing.....	1	1	155	140	4	4	48,136	38,350	43	9	35	40	12
31	Powder manufactory.....	1	1	80	95	36	4	41,735	53,880	23	23	6	40	12
32	Saw mills, sash, doors and lumber.....	6	6	787	752	36	4	246,039	263,932	36	16	41	11	8
33	Starch manufactory.....	1	1	12	11	1	1	6,926	9,038	50	2	50	52	52
34	Street railways.....	1	1	36	8	4	1	20,245	5,300	52	52	52	52	52
35	Telephone exchange.....	1	1	2	4	1	1	1,886	2,000	52	52	52	52	52
36	Wholesale drugs.....	1	1	8	7	7	7	4,200	4,200	52	52	52	52	52
37	Wholesale fruits.....	1	1	6	6	6	6	2,500	2,500	52	52	52	52	52

LEE COUNTY—CONTINUED.

Line No.	KIND OF BUSINESS.	NO. REPORTING		NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.		
		No. reporting, 1897.	No. reporting, 1898.	Males.	Females.	Apprentices.	Males.	Females.	Apprentices.			Full time, full force.	Short time, reduced force.	Suspended.	Full time, full force.	Short time, reduced force.	Suspended.
		38	Wholesale groceries	4	4	65	7	...	61			6	...	48,772	47,554	52	...
39	Wholesale and retail hardware	3	2	25	7	...	25	1	...	20,886	16,231	52	...	...	47	5	...
40	Wholesale jewelry and music	1	2	14	2	...	14	2	...	10,600	10,600	52	...	...	52	...	...
41	Wholesale and retail millineries	2	2	20	20	4	21	25	4	22,610	22,850	52	...	...	40	12	...
42	Wholesale oils	1	1	9	2	...	14	3	...	8,000	11,000	52	...	...	52	...	...
43	Wholesale poultry, eggs and butter	1	1	17	...	...	15	...	...	9,000	7,500	42	10	...	34	18	...
44	Wire fence manufactory	1	1	7	...	...	...	...	...	1,275	...	7	...	45	...	...	...
45	Wood, ice and coal, retail	2	2	161	1	...	146	1	...	19,400	17,000	44	8	...	44	8	...
	Total	82	85	2,912	774	54	3,689	436	86	\$ 1,156,801	\$ 1,752,345	45	5	2	46	5	1
	Average																

* 129 convicts. † 139 convicts. ‡ \$17,010 for free labor.

LINN COUNTY.

1	Agricultural implement dealer	1	1	5	1	...	18	3	...	\$ 4,774	\$ 5,154	52	...	...	52	...	...
2	Bakery	1	1	7	1	...	7	2	...	1,780	9,000	52	...	...	52	...	...
3	Boiler, machine and repair shop	1	2	29	...	...	35	1	4	11,747	17,473	32	20	...	37	15	...
4	Brewing and bottling	1	1	23	2	...	...	...	...	13,704	...	52	...	...	...	...	...
5	Buggy, wagon and dray manufactory	1	1	18	...	8	15	...	3	5,200	4,000	35	17	...	40	12	...
6	Canning factory	1	1	...	...	...	25	100	...	6,487	...	52	...	...	6	10	36
7	Oigar manufactory	1	1	3	3	2	...	...	...	2,592	...	52	...	...	...	...	...
8	Clothing manufactory	1	1	10	55	...	...	...	...	14,782	...	52	...	...	...	...	...
9	Clothing, retail	3	4	27	3	3	34	4	3	20,567	22,125	52	...	...	52	...	...
10	Coal and wood, wholesale and retail	2	2	12	...	...	15	...	...	7,450	8,490	40	12	...	48	4	...
11	Creamery supply manufactory	1	1	...	...	...	7	...	...	5,876	...	52	...	...	52	...	...
12	Cracker, cake and confectionery mfty	2	2	40	52	24	57	65	...	34,290	48,350	44	8	...	25	27	...
13	Construction of sewers	2	1	162	...	...	10	...	...	17,000	5,350	36	16	...	26	26	...
14	Crockery, wholesale and retail	1	1	12	3	...	12	3	...	10,036	11,031	52	...	...	52	...	...
15	Dry goods, carpets and millinery	4	6	51	76	2	58	78	1	48,221	68,128	52	...	...	52	...	...
16	Electric light, heat and power	1	1	25	...	...	21	...	...	13,850	14,328	52	...	...	52	...	...
17	Insurance, fire and life	1	1	25	...	...	27	...	...	23,196	23,884	52	...	...	52	...	...
18	Furniture manufacturers and retailers	2	2	18	...	...	19	...	1	6,350	8,074	46	6	...	46	6	...
19	Gas manufactory	1	1	12	...	...	13	...	...	6,500	7,000	52	...	...	52	...	...

20	General merchandise	1	1	30	42	...	35	39	1	12,000	12,000	52	...	...	52	...	...
21	Groceries, retail	1	1	7	...	...	7	1	...	2,382	1,600	52	...	...	52	...	...
22	Hardware, tinware, etc	1	1	7	...	...	7	...	...	2,382	2,300	32	20	...	52	...	...
23	Hotels	5	5	49	72	...	51	63	...	24,758	22,334	52	...	...	52	...	...
24	Iron basket manufactory	1	1	7	1	...	...	...	...	2,044	...	38	14	...	...	...	...
25	Laundry	3	2	8	24	...	6	17	...	9,516	7,250	52	...	...	52	...	...
26	Linseed oil mill	1	1	7	...	...	25	...	...	8,818	10,525	52	...	...	52	...	...
27	Machine shop and mill supplies	1	1	12	...	...	...	...	...	6,500	...	52	...	...	...	...	...
28	Medicine manufactory	1	1	6	4	...	7	4	...	3,285	4,200	48	4	...	52	...	...
29	Merchant tailoring	1	1	...	...	...	9	...	...	2,560	...	40	...	...	40	...	12
30	Milling and flour	2	2	216	105	...	235	132	...	111,395	140,026	48	4	...	44	8	...
31	Planing mill work and lumber	3	3	97	...	...	88	...	...	39,130	38,950	29	23	...	31	21	...
32	Pork packing	1	1	617	15	...	555	11	...	250,315	280,396	7	45	...	30	22	...
33	Printing, publishing and binding	4	3	89	24	...	82	9	...	64,904	59,331	52	...	...	52	...	...
34	Pump and windmill manufactories	3	3	75	5	...	91	4	...	38,400	51,000	31	21	...	42	10	...
35	Plumbing	1	1	11	...	...	11	1	...	5,000	4,500	16	38	...	44	8	...
36	Quarrying stone	1	1	15	...	...	30	...	2	3,000	4,155	20	28	4	25	15	12
37	Street railway	1	1	87	...	...	74	...	...	39,242	38,014	52	...	...	52	...	...
38	Stock food manufactory	1	1	5	...	...	...	...	...	1,800	...	52	...	...	...	...	...
39	Telephone	1	1	3	7	...	3	6	...	3,250	3,200	52	...	...	52	...	...
40	Transfer and dray	1	1	...	...	...	11	1	...	1,874	...	...	...	...	26	26	...
41	Wall paper, books, paints and stationery	1	1	12	2	...	9	2	...	5,759	7,899	52	...	...	52	...	...
42	Wall paper and painting	3	3	44	2	2	36	2	2	13,600	17,000	40	12	...	37	15	...
43	Water supplying	1	1	10	...	...	24	...	...	13,697	11,829	52	...	...	52	...	...
44	Wholesale coffee and tea	1	1	6	...	...	7	...	...	4,820	5,960	52	...	...	52	...	...
45	Wholesale groceries	3	4	40	...	...	53	...	...	38,104	42,957	52	...	...	52	...	...
46	Wholesale and retail ice	2	3	33	...	...	35	...	...	11,760	11,584	52	26	...	25	27	...
47	Wholesale liquor dealer	1	1	11	...	...	23	...	...	7,140	7,407	52	...	...	52	...	...
48	Wool, hides, rags and old iron	1	1	5	...	...	...	...	...	3,150	...	50	2	...	52	...	...
49	Wholesale millinery	1	1	...	...	...	16	6	...	...	14,322	...	...	...	52	...	...
	Total	72	73	1,974	499	36	2,020	554	17	\$ 955,536	\$ 1,067,773	48	3	1	48	3	1
	Average																

LOUISA COUNTY.

1	Canning vegetables	1	1	...	...	...	125	75	...	\$ 8,500	...	...	...	...	6	46	...
2	Hotels	3	...	...	...	...	4	12	...	3,360	...	...	...	...	52	...	...
3	Printing and publishing	1	...	...	...	...	4	2	1	1,300	...	...	...	...	52	...	...
4	Soap manufactory	1	...	...	...	...	6	...	...	3,200	...	...	...	...	52	...	...
	Total	6	...	...	...	...	139	89	1	\$ 16,360	...	...	...	...	43	9	...
	Average																

LUCAS COUNTY.

Line No.	KIND OF BUSINESS.	NO. REPORTING, 1897.		NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.			
		No. reporting, 1897.	No. reporting, 1898.	Males.	Females.	Apprentices.	Males.	Females.	Apprentices.			Fulltime, full force.	Short time, reduced force.	Suspended.	Fulltime, full force.	Short time, reduced force.	Suspended.	
1	Broom manufactory	1	1	5	2	2	8	2	2	\$ 1,800	\$ 1,490	47			5	30	14	8
2	Carriage and wagon manufactory.....	1	1	15		3	15		3	6,500	6,150	52				42	10	
3	Coal mining.....	1	1	30			40			10,170	13,000	37	15			24	24	4
4	Hotel.....	1	1	6	8		11	12		1,998	4,340	52				52		
5	Lumber and grain.....	1	1	50			40			35,000	20,000	52				52		
6	Printing and binding.....	1		5		2				1,200		52						
	Total.....	6	6	111	10	7	114	14	5	\$ 56,668	\$ 44,980	48	2	1	33	8	2	
	Average.....																	

LYON COUNTY.

1	Hotel.....	1		4	3		5	7		\$ 1,092	\$ 1,900	52				52		
	Total.....	1		4	3		5	7		\$ 1,092	\$ 1,900	52				52		
	Average.....																	

MADISON COUNTY.

1	General merchandise.....	1	1	7			8			\$ 3,156	\$ 3,390	52				52		
2	Hotel.....	1	1	3	5		3	5		1,416	1,522	48	4			52		
	Total.....	2	2	10	5		11	5		\$ 4,572	\$ 4,912	50	2			52		
	Average.....																	

MAHASKA COUNTY.

1	Bakery.....	1	1	4	1		5	1	1	\$ 1,560	\$ 2,500	52				52		
2	Building and paving brick.....	1	1	50			50			15,000	17,500	35				30		23
3	Cigar factories.....	2	2	10			11		1	3,188	1,800	49				33		1
4	Clothing, retail.....	2	2	10	1		11			8,700	7,800	52				52		
5	Coal mines.....	12	11	1,981	3		2,096	3		1,034,641	1,980,320	30				33	10	10
6	Dry goods and millinery.....	2	3	18	45	0	21	33	3	38,176	39,188	68				68		

7	Eggs, shipping and packing.....	1	1	7			16	1		2,483	2,833	38		14		30		22
8	Electric light and power.....	1	1	9			10			5,940	6,840	52				52		
9	Harness and saddlery m'rs and jobbers..	1	1	9	1		11	1		4,880	5,000	52				52		
10	Hotels.....	1	2				14	14		7,500	7,400	48		4		52		
11	Iron bridge manufacturers.....	1		17	2		23	1		10,400	10,000	52				52		
12	Livery and transfer.....	1	1	21	1		9	9		6,240	6,240	52				52		
13	Laundry.....	1	1				38	11	7	19,273	19,273	52				52		
14	Printing and publishing.....	2	4	5	7		6	9		5,040	3,240	52				52		
15	Telephone exchange.....	2	2	5	7		6	9		2,310	2,310	52				52		
16	Wholesale confectioner.....	1	1	6	2		25	3		20,593	20,597	52				52		
17	Wholesale grocery.....	1	2	20	2		11			8,497	7,451	52				52		
18	Wholesale hardware.....	1	1	10								52				52		
	Total.....	30	36	2,177	65	8	2,357	106	11	\$ 1,144,702	\$ 1,435,988	49	2	2	47	1	4	
	Average.....																	

MARION COUNTY.

1	Canning vegetables.....	1	1	45	65		48	95		\$ 3,947	\$ 6,703	8	13	31	8	16	28
2	Coal mining.....	4	3	118			120			37,750	41,786	34	6	12	30	20	2
3	Ditcher manufacturing.....	1	1	22			9			3,000	3,500	35	17		52		
4	Stone quarry.....	1		8						128		4		48			
5	Wagon manufacturing.....	1	1	15			27			5,200	10,720	52			34	18	
	Total.....	8	6	206	65		204	95		\$ 50,025	\$ 62,709	30	6	16	31	13	8
	Average.....																

MARSHALL COUNTY.

1	Agricultural implements, whol. and retail	3	1	32	5		13	2		\$ 18,074	\$ 15,000	52				52		
2	Bottling works.....	1		6						2,720		26	26		27	3	22	
3	Brick and tile manufactories.....	2	3	28			44			46,035	8,219	22	18	12	43	9		
4	Candy and syrup manufactory.....	1	1	13	6		20	15		4,800	10,000	36	12	4	6	10	36	
5	Canning factory.....	1	1	150	50		130	131		4,000	10,000	5	3	44	3	14	3	
6	Buggy and carriage factory.....	1	1	60	10		80	10		24,715	41,000	32	18	2	36	14	17	
7	Dry goods and carpets, whol. and retail..	2	4	7	10		14	22		10,055	11,608	49			35			
8	Foundry and machinery manufactories....	3	3	68	1	4	81	3	6	24,536	34,833	45		7	52			
9	Furniture, carpets and undertakers.....	1	1	7	1		13	3		4,470	8,738	52			52			
10	General store.....	1	1	4	12	3	12	8		1,800	6,000	52			52			
11	Hardware dealer.....	1	1	6	1		7	1		4,100	5,810	52			52			
12	Hides, wool and tallow.....	1	1	11	1		18	2		4,500		52			52			
13	Hotels and restaurants.....	2	3	2	15		33	22		2,100	17,706	52			52			
14	Ice, wood and coal.....	2	1	10			10			5,000	5,000	52			52			
15	Laundries.....	1	1	4	10		10	21		4,000	12,000	52			52			
16	Livery, transfer and dray.....	1	1	10			14	1		4,000	6,520	52			52			
17	Lumber and planing mills.....	2	2	12	1		25	2		5,840	18,080	40	12		40	12		
18	Milling.....	1	1	9			10		1	5,400	5,400	40	12		35	17		
19	Printing, publishing and binding.....	3	2	46	6	4	37	3	3	31,398	27,378	52			52			
20	Pork packing.....	1	1	95	5		120	10		37,449	47,276	52			52			

MARSHALL COUNTY—CONTINUED.

Line No.	KIND OF BUSINESS.	NO. REPORTING, 1897.		NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.		
		No. reporting, 1897.	No. reporting, 1898.	Males.	Females.	Apprentices.	Males.	Females.	Apprentices.			Full time, full force.	Short time, reduced force.	Suspended.	Full time, full force.	Short time, reduced force.	Suspended.
21	Quarrying stone.....	1	1	150	.....	.....	143	.....	.....	36,182	39,531	52	.....	.....	35	17	.....
22	Street railway and electric light.....	1	1	22	.....	.....	22	.....	.....	10,616	10,928	52	.....	.....	52	.....	.....
23	Telephone exchange.....	1	1	3	6	.....	3	7	.....	3,860	3,850	52	.....	.....	52	.....	.....
24	Vinegar and soap.....	1	1	11	4	.....	10	5	.....	6,500	5,000	52	.....	.....	52	.....	.....
25	Wholesale grocers.....	2	2	39	6	.....	44	5	.....	45,929	38,200	52	.....	.....	52	.....	.....
	Total.....	36	40	805	150	13	803	273	10	\$ 331,609	\$ 387,923	49	2	1	45	3	4
	Average.....																

MILLS COUNTY.

1	Neck yoke manufactory.....	1	1	7	.....	.....	7	.....	.....	\$ 2,350	\$ 4,908	52	.....	.....	52	.....	.....
	Total.....	1	1	7	.....	.....	7	.....	.....	\$ 2,350	\$ 4,908	52	.....	.....	52	.....	.....
	Average.....																

MITCHELL COUNTY.

1	Hotel.....	1	1	2	9	.....	2	10	.....	\$ 2,972	\$ 3,200	52	.....	.....	52	.....	.....
	Total.....	1	1	2	9	.....	2	10	.....	\$ 2,972	\$ 3,200	52	.....	.....	52	.....	.....
	Average.....																

MONONA COUNTY

1	Hotel.....	1	1	2	4	.....	1	5	.....	\$ 1,109	\$ 1,109	52	.....	.....	52	.....	.....
2	Sorghum manufactory.....	1	1	7	11	* 88	293	3	49	5	47
	Total.....	2	2	9	4	12	5	\$ 1,197	\$ 1,402	55	57
	Average.....																

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MONROE COUNTY.

1	Canning vegetables.....	1	1	20	30	25	40	\$ 2,000	\$ 2,100	8	44	12	4	36
2	Cigar manufactories.....	1	2	5	10	4	2	2,500	3,860	48	4	26	25	1
3	Coal mining.....	3	2	780	.....	.....	780	.....	.....	403,731	418,414	31	15	6	37	15	21
4	Hotels.....	1	2	4	8	.....	7	8	.....	1,632	1,550	52	.....	.....	31	.....	.....
	Total.....	6	7	819	38	.....	822	52	2	\$ 409,863	\$ 425,924	34	7	11	29	12	11
	Average.....																

MONTGOMERY COUNTY.

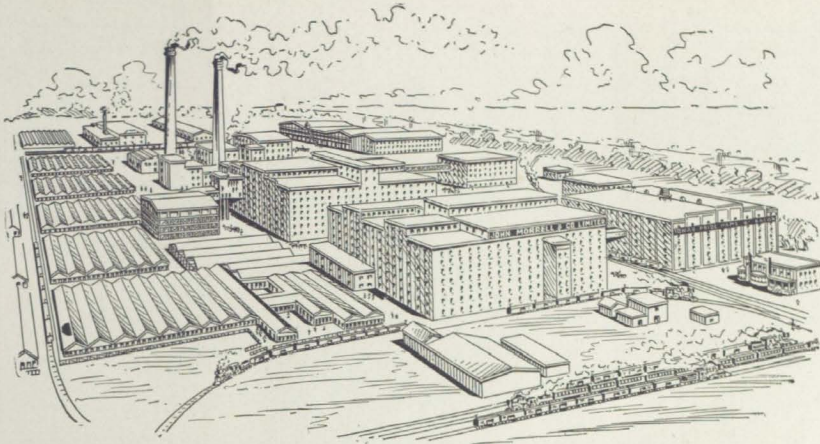
1	Brick and tile manufactories.....	3	3	45	50	.....	50	.....	1	\$ 9,875	\$ 11,603	24	12	16	30	.....	22
2	Calendar and embossed stationery mfty.....	1	1	50	50	10	.....	.....	.....	30,000	.....	26	26	.....	.....	.....	.....
3	Dry goods, retail.....	1	2	2	3	.....	7	16	.....	2,076	5,930	52	.....	.....	52	.....	.....
4	Hotels.....	1	2	4	12	.....	1	10	.....	2,862	1,525	52	.....	.....	52	.....	.....
5	Manufacturing bee supplies and tanks.....	1	1	40	.....	.....	34	.....	.....	4,100	8,300	12	40	.....	26	26	.....
6	Wholesale grocery.....	1	1	6	1	.....	6	1	.....	6,700	6,600	52	.....	.....	52	.....	.....
7	Wholesale and retail flour and feed.....	1	1	12	.....	.....	12	.....	.....	6,616	6,616	48	4	.....	48	4	.....
	Total.....	9	10	159	66	10	110	27	1	\$ 62,229	\$ 40,574	35	12	5	42	3	7
	Average.....																

MUSCATINE COUNTY.

1	Brick manufactories.....	2	3	20	.....	.....	27	.....	2	\$ 3,700	\$ 5,420	30	.....	22	22	.....	30
2	Cigar manufactories.....	2	2	7	11	1	7	10	.....	5,253	5,819	52	.....	.....	51	1	.....
3	Olay pipe manufactory.....	1	1	4	1	.....	.....	.....	.....	1,500	.....	52	.....	.....	.....	.....	.....
4	Oooperage.....	1	1	6	.....	.....	6	.....	.....	2,500	2,400	38	.....	14	40	.....	12
5	Contractor and builder.....	1	1	9	.....	.....	2	11	.....	1,617	2,533	26	.....	26	36	.....	16
6	Crockery, glassware, etc.....	1	1	12	.....	.....	11	.....	.....	5,600	5,500	52	.....	.....	52	.....	.....
7	Dry goods, millinery and notions.....	3	3	29	25	2	15	31	1	15,987	16,938	52	.....	.....	52	.....	.....
8	Groceries, wholesale.....	3	3	18	.....	.....	30	1	.....	21,661	21,769	52	.....	.....	52	.....	.....
9	Hotels and restaurants.....	1	1	19	11	.....	15	20	.....	3,643	3,883	.....	.....	.....	52	.....	.....
10	Heat, light and power.....	1	1	74	1	.....	.....	.....	.....	18,000	.....	52	.....	.....	.....	.....	.....
11	Laundries.....	1	3	.....	.....	.....	8	18	.....	7,228	.....	.....	.....	.....	52	.....	.....
12	Lumber, sash, doors and blinds.....	4	5	925	.....	.....	917	.....	.....	309,421	288,075	32	10	10	32	10	10
13	Machine shop, foundry and plumbing.....	2	3	45	2	4	58	2	4	20,834	27,218	34	18	.....	44	8	.....
14	Newspaper publishing and printing.....	2	2	30	.....	.....	2	40	2	20,368	17,164	52	.....	.....	52	.....	.....
15	Oatmeal and cereals.....	1	1	68	69	.....	54	53	.....	39,574	42,000	50	.....	2	49	.....	.....
16	Pearl button manufactories.....	5	13	153	155	.....	317	157	.....	73,112	127,352	38	4	10	33	4	10
17	Saddlery and harness.....	1	1	35	2	2	42	3	2	11,872	20,769	40	12	.....	50	2	.....
18	Stoneware and flower pots.....	1	1	10	.....	.....	10	.....	.....	2,200	2,300	35	.....	17	40	12	.....
19	Truck farming and commission.....	1	1	10	5	.....	10	5	.....	3,574	3,574	30	22	.....	30	22	.....
	Total.....	33	37	1,367	280	13	1,579	282	14	\$ 559,403	\$ 597,942	44	2	6	39	4	9
	Average.....																

POLK COUNTY—CONTINUED.

Line No.	KIND OF BUSINESS.	NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.		
		Males.	Females.	Apprentices.	Males.	Females.	Apprentices.			Full time, full force.	Short time-reduced force.	Suspended.	Full time, full force.	Short time-reduced force.	Suspended.
20	Furniture and mattress manufactories.....	41	4	.....	97	11	5	15,862	43,738	42	10	.....	40	12	.....
21	Furniture, retail.....	15	.....	.....	25	2	3	6,800	12,232	.....	.....	.....	.....	.....	.....
22	Gas, electric light and power.....	85	3	1	183	4	.....	49,740	64,905	.....	.....	.....	.....	.....	.....
23	General merchandise.....	3	5	1	16	24	.....	4,300	13,358	.....	.....	.....	.....	17	.....
24	Glove and mitten manufactory.....	1	1	35	15	.....	35	40	14,000	30,000	30	.....	.....	.....	.....
25	Groceries, retail.....	4	5	56	4	.....	104	9	30,400	57,250	.....	.....	.....	.....	.....
26	Hotels and restaurants.....	9	14	174	83	.....	335	113	55,380	83,591	.....	.....	.....	.....	.....
27	Ice and cold storage.....	3	.....	.....	120	.....	.....	.....	120,457	.....	.....	.....	.....	.....	30
28	Incubator and brooder manufactory.....	1	1	25	3	.....	20	5	10,863	12,500	.....	.....	.....	.....	.....
29	Iron, junk and rags.....	1	.....	.....	10	.....	.....	.....	5,000	.....	.....	.....	.....	.....	.....
30	Insurance—fire and life.....	12	11	125	33	.....	123	31	128,100	158,456	8	44	.....	.....	30
31	Ice, retail.....	1	1	100	.....	.....	60	20	11,157	.....	.....	.....	.....	.....	.....
32	Rolling mills.....	1	1	25	55	.....	60	20	30,949	19,659	.....	.....	.....	.....	.....
33	Laundries.....	4	10	25	58	.....	54	100	27,629	54,128	.....	.....	.....	.....	.....
34	Lime and building material.....	1	1	.....	10	.....	.....	.....	6,400	7,500	.....	.....	.....	.....	.....
35	Lined oil works.....	1	1	16	.....	.....	20	.....	7,400	10,484	.....	.....	.....	.....	10
36	Livery, hacks and baggage.....	4	.....	.....	65	1	.....	.....	31,760	.....	.....	.....	.....	.....	.....
37	Monuments—stone and bronze.....	2	3	13	2	.....	22	2	8,455	9,886	.....	.....	.....	.....	.....
38	Merchant tailors.....	3	4	41	6	.....	47	9	18,960	25,594	48	4	.....	.....	.....
39	Millinery, retail.....	1	1	1	29	3	1	6	4,900	1,500	32	30	.....	.....	22
40	Milling, flour and feed.....	1	1	17	.....	.....	30	.....	7,500	12,000	.....	.....	.....	.....	.....
41	Newspapers—printing and binding.....	13	14	332	50	14	380	79	213,981	243,663	.....	.....	.....	.....	.....
42	Painting and paper hanging.....	6	7	125	3	8	144	2	61,920	29,385	30	23	.....	.....	26
43	Peanut and coffee-roasting machines.....	1	1	19	1	.....	24	1	9,498	5,948	.....	.....	.....	.....	.....
44	Planing mill, work and lumber.....	4	6	99	.....	.....	134	.....	41,868	70,114	44	8	.....	.....	14
45	Proprietary and patent medicines.....	1	1	35	53	.....	87	60	34,907	39,270	.....	.....	.....	.....	52
46	Plumbing, heating and steam fitting.....	5	5	60	2	8	57	1	29,571	21,833	.....	.....	.....	.....	39
47	Pumps & windmill & m'chry man factories	2	3	36	1	.....	103	1	18,700	33,347	.....	.....	.....	.....	47
48	Saddlery and harness manufactory.....	1	.....	46	13	.....	.....	.....	12,234	.....	.....	.....	.....	.....	.....
49	Sawmill.....	1	1	6	.....	.....	.....	.....	3,000	.....	.....	.....	.....	.....	.....
50	Scale manufactory.....	1	1	6	.....	.....	.....	.....	1,700	1,500	.....	.....	.....	.....	52
51	Shirt manufactory.....	1	1	1	12	.....	.....	.....	3,863	.....	.....	.....	.....	.....	.....
52	Shoes and boots, retail.....	4	30	8	.....	.....	28	6	19,080	16,822	.....	.....	.....	.....	.....
53	Soap manufactories.....	2	3	.....	23	2	.....	.....	10,505	9,833	.....	.....	.....	.....	46
54	Starch manufactory.....	1	1	163	46	.....	178	45	82,933	88,664	.....	.....	.....	.....	52



Morrell Packing Co. (Limited), Ottumwa. The largest packing company in the state.

55	Street railway	1	1	204	223	17,853	119,576	52	63									
56	Suspender manufactories	2	2	16	11	10,702	10,364	50	5									
57	Telephone	1	1	19	12	23	13,200	52	26									
58	Tent and awning manufactory	1	1	19	17	8	3,740	22	30									
59	Transfers and general deliveries	4	4	68	71	9	33,291	52	52									
60	Trunk and valise manufactory	1	1	5	1	1	1,000	40	12									
61	Typewriter manufactory	1	1	50	118	4	22,000	52	51									
62	Vinegar, pickle and cider manufactory	1	1	17	16	4	10,000	52	52									
63	Wholesale agricultural implements	2	2	37	39	5	30,280	52	52									
64	Wholesale boots and shoes	1	1	12	12	2	6,000	52	52									
65	Wholesale bakery	1	1	13	12	2	4,750	52	52									
66	Wholesale butter and eggs	1	1	9	34	5	4,134	12,000	46									
67	Wholesale candy and confections	1	1	8	5	3	2,350	52	36									
68	Wholesale drugs	2	2	18	1	1	2,813	52	16									
69	Wholesale dry goods	2	2	34	31	1	14,300	52	52									
70	Wholesale fruits	1	1	34	94	9	25,000	52	52									
71	Wholesale groceries	2	2	40	4	3	43,476	52	52									
72	Wholesale hardware	2	2	3	49	3	37,260	42,870	52									
73	Wholesale meats	1	1	7	9	3	4,716	6,558	52									
74	Wholesale millinery	1	1	33	8	61	30,000	30	26									
75	Wholesale oils and grease	1	1	23	21	1	50,000	19,200	52									
76	Wholesale paper	1	1	10	11	1	6,863	7,700	52									
77	Wholesale and retail queensware	1	1	16	11	4	10,533	11,900	52									
78	Wholesale and retail seeds	1	1	15	16	10	7,421	5,783	36									
79	Woolen goods and trousers	1	1	33	40	50	25,175	28,000	52									
Total		180	222	4,188	893	89	5,371	1,251	102	\$ 2,229,324	\$ 2,747,110	43	8	1	45	6	1	
Average																		

POTTAWATTAMIE COUNTY.

1	Agricultural implement manufactory	1	1		8		\$ 3,351		52
2	Agricultural Imp's, wholesale and retail	11	12	182	150	30	\$ 114,389	180,050	52
3	Asic grease manufactory	1	1		11		7,790		48
4	Brick and tile manufactories	2	3	39	49	2	5,000	11,200	14
5	Carpets and draperies	1	1		4		3,600		39
6	Carriage and wagon manufactories	2	1	54	52	4	16,855	16,480	39
7	Cigar manufactories and sale	2	1	9	2	7	3,600	2,500	40
8	Cleaning and dyeing	1	1		2	3	3,178		52
9	Collar manufactory (horse)	1	1		2	5	2,700		52
10	Confectionery manufactories and sale	1	2	6	27	33	4,260	10,672	52
11	Contractor and builder	1	2	6	16	43	1,860		15
12	Dry goods retail	2	2	33	35	1	37,796	34,000	52
13	Foundry and machine shop	1	1	15	23		6,400	10,200	39
14	Gas and electric light	1	1	33	40	1	21,000	17,749	52
15	Groceries, wholesale	2	2	33	40	1	21,000	15,500	52
16	Hardware, wholesale and retail	2	3	25	38	1	24,200	30,207	52
17	Hotels and restaurants	4	4	39	37	35	24,150	31,247	52
18	Laundries	3	4	28	42	66	26,500	33,400	52

POTAWATTAMIE COUNTY—CONTINUED.

Line No.	KIND OF BUSINESS.	NO. REPORTING, 1897.			NO. EMPLOYED, 1897.			AMOUNT OF WAGES PAID OUT IN 1897.	AMOUNT OF WAGES PAID OUT IN 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.				
		No. reporting, 1897.	No. reporting, 1898.		Males.	Females.	Apprentices.			Males.	Females.	Apprentices.	Full time, full force.	Short-time, reduced force.	Suspended.	Full time, full force.	Short-time, reduced force.	Suspended.
19	Lumber, sash, doors, blinds.	1	2	5	1	16	3,600	5,990	52	42	12	82	42	12	6		
20	Merchant tailors.	1	2	14	1	16	7,100	11,000	40	40	12	40	12	18	4		
21	Milling, grain and feed.	1	3	27	1	26	17,063	16,473	16	16	4	12	40	38	6		
22	Newspaper printing and binding.	1	1	4	1	4	23,600	31,000	51	51	14	38	52	52	14		
23	Painting and paper hanging.	1	1	10	1	10	3,400	5,000	38	11	11	32	32	32	14		
24	Plumbing and heating.	1	3	31	7	28	14,692	12,146	30	30	15	7	32	32	32		
25	Scales manufactory.	1	1	22	1	21	6,800	10,000	52	52	11	32	32	32	32		
26	Transfer and heavy.	1	1	14	1	14	6,543	6,500	52	52	11	32	32	32	32		
27	Water works.	1	1	12	1	14	8,000	8,430	51	51	11	32	32	32	32		
28	Wholesale crockery.	1	1	18	2	20	11,800	14,300	52	52	11	32	32	32	32		
29	Wholesale drags.	1	1	10	1	10	7,000	10,000	52	52	11	32	32	32	32		
30	Wholesale and retail ice.	1	1	14	1	14	3,952	3,952	52	52	11	32	32	32	32		
	Total.	49	59	688	171	21	809	237	23	\$ 395,538	\$ 519,841	44	4	4	47	4	1
	Average.																

POWESHIEK COUNTY.

1	Brick and tile	1	2	7	4	12	4	\$ 1,300	\$ 2,350	30	13	20	34	18	27
2	Carriage and wagon factory	1	1	111	4	130	25	83,781	65,057	39	13	20	34	18	17
3	Contractor and builder	1	1	13	1	13	1	4,574	4,574	52	52	17	18	18	17
4	Dry goods and millinery	1	2	4	5	9	2,500	5,000	52	40	12	52	52	52	52
5	Gloves and mitten factory	1	1	40	45	41	44	21,107	32,154	40	12	40	12	12	12
6	Hardware and implements.	1	1	1	1	1	1	3,000	3,000	52	52	52	52	52	52
7	Hotels.	3	4	9	21	10	21	6,786	5,516	52	52	52	52	52	52
8	Laundry	1	1	2	4	2	6	2,850	3,000	52	52	52	52	52	52
9	Lumber, wholesale and retail.	1	1	18	2	20	3	11,800	14,300	52	52	52	52	52	52
10	Meat markets.	1	1	6	5	5	5	2,500	3,675	52	52	52	52	52	52
11	Printing and publishing.	1	1	6	5	9	3	5,000	5,353	40	12	32	32	32	32
12	Wholesale butter and eggs.	1	1	1	1	1	1	6,500	6,500	52	52	52	52	52	52
	Total.	11	18	196	83	260	90	\$ 99,138	\$ 143,953	42	6	4	46	4	2
	Average.														

RINGOLD COUNTY.

1	Brick and tile	1	1	8	9	4	\$ 1,650	\$ 1,700	18	14	20	18	16	18	
2	Printing and publishing.	1	1	3	3	4	3	1,400	1,638	52	52	52	52	52	52
	Total.	2	2	11	3	13	3	\$ 3,050	\$ 3,338	35	7	10	35	8	9
	Average.														

SOOT COUNTY.

1	Agricultural implements.	1	1	6	5	5	\$ 2,700	\$ 2,200	52	52	52	52	52	52		
2	Bakery.	1	1	10	11	11	1	7,000	7,000	52	52	52	52	52	52	
3	Bottling works.	1	1	15	15	15	5,639	5,639	52	52	27	25	8	22		
4	Building brick and tile manufactory.	2	3	45	48	47	6,713	10,990	25	26	50	50	50	50		
5	Burton manufactory.	1	1	1	1	150	1	4,800	5,000	52	52	52	52	52		
6	Broom manufactory.	1	1	26	33	7	8,372	10,193	48	4	51	51	51	51		
7	Carpet loom manufactory.	1	1	113	43	50	100	4,655	7,622	4	48	4	4	4		
8	Canning corn.	2	2	85	45	3	95	48,015	53,186	44	8	41	11	11		
9	Candy and cracker manufactory.	1	1	19	10	26	11	21,992	23,557	52	52	52	52	52		
10	Coffee roasters and baking powder.	1	1	8	3	3	3	4,800	5,000	52	52	52	52	52		
11	Crockery and glassware.	1	1	4	4	10	9	13,299	16,857	51	1	44	3	1		
12	Clothing manufactory (duck).	3	5	85	230	4	133	103	6	79,490	110,915	42	8	2	47	5
13	Cigar box manufactory.	1	1	1	1	1	1	10,000	10,000	52	52	52	52	52	52	
14	Cigar box manufactory.	1	1	1	1	1	1	10,000	10,000	52	52	52	52	52	52	
15	Clothing dealer.	1	5	10	24	10	5,000	16,600	52	52	52	52	52	52	52	
16	Coal mining.	1	1	28	28	28	28	3,000	46,987	40	12	3	40	12	12	
17	Contractor.	1	1	80	79	79	79	4,614	30,469	45	12	39	13	13	13	
18	Cooperage manufactory.	1	1	1	1	1	1	2,266	2,787	34	18	39	13	13	13	
19	Druggist, retail.	1	1	1	1	1	1	5,200	6,000	52	52	52	52	52	52	
20	Dry goods and department store.	1	4	154	163	164	155	5	118,041	70,511	16	36	52	52	52	52
21	Foundry and machine shop.	1	1	40	4	100	20,000	26,400	30	22	52	52	52	52	52	
22	Furniture and washing machine man'fy.	1	1	20	20	20	20	15,000	16,728	52	52	52	52	52	52	
23	Furniture, carpets, etc., retail.	3	3	31	3	36	4	14,646	15,945	52	52	52	52	52	52	
24	Electric light and power.	2	2	49	1	50	2	32,800	34,000	52	52	52	52	52	52	
25	Grain dealers.	1	1	36	3	40	2	17,800	14,600	36	16	32	20	20	20	
26	General packing—pork.	1	1	1	1	1	1	30,469	30,469	52	52	52	52	52	52	
27	Hotel.	2	5	21	32	34	66	11,800	20,228	52	52	52	52	52	52	
28	Insurance, fire and life.	3	7	26	2	31	3	39,260	32,757	16	36	36	36	36	36	
29	Ice manufactory and cold storage.	1	1	6	2	9	2	4,614	5,264	52	52	52	52	52	52	
30	Laundry.	3	5	8	33	16	55	13,000	20,884	52	52	52	52	52	52	
31	Macaroni manufactory.	1	1	1	1	1	1	14,725	13,411	52	52	52	52	52	52	
32	Mailing and brewing.	1	1	40	37	34	34	18,000	18,231	52	52	52	52	52	52	
33	Manufactory of overalls.	1	1	1	1	1	1	2,914	3,264	32	26	44	44	44	44	
34	Milling.	1	1	15	2	17	1	5,960	6,584	52	52	52	52	52	52	
35	Marble and granite mantle.	1	1	1	1	1	1	2,000	2,000	52	52	52	52	52	52	
36	Paper box factory.	1	1	1	1	1	1	2,360	2,360	52	52	52	52	52	52	
37	Printing and binding, publishing.	1	7	103	13	116	15	71,983	77,552	32	16	52	52	52	52	
38	Plumbing and steam heating.	1	1	22	8	21	1	7,772	8,774	36	16	52	52	52	52	
39	Poultry, butter and eggs.	1	1	1	1	1	1	6,000	6,000	52	52	52	52	52	52	

SCOTT COUNTY—CONTINUED.

Line No.	KIND OF BUSINESS.	No. reporting, 1927.			NO. EMPLOYED, 1927.			NO. EMPLOYED, 1926.			Amount of wages paid out in 1927.	Amount of wages paid out in 1926.	NO. WEEKS IN OPERATION, 1927.			NO. WEEKS IN OPERATION, 1926.		
		No. reporting, 1927.	No. reporting, 1926.	No. reporting, 1925.	Males.	Females.	Apprentices.	Males.	Females.	Apprentices.			Full time, full force.	Short time, reduced force.	Suspended.	Full time, full force.	Short time, reduced force.	Suspended.
40	Pump and well machinery manufactory	1	1	30	30	.....	30	.....	.....	10,000	10,000	52	.....	.....	50	.....	.....
41	Rope walk	1	1	6	.....	.....	.....	.....	.....	1,086	.....	46	.....	.....	.....	.....	.....
42	Saab, doors, lumber and woodwork	1	1	209	.....	.....	.....	.....	.....	81,214	180,459	32	10	1	.....	.....	.....
43	Soap factory	1	1	5	.....	.....	.....	.....	.....	1,600	1,200	52	.....	.....	.....	.....	.....
44	Steel axles and metal work	1	1	200	.....	.....	.....	.....	.....	78,432	105,541	52	.....	.....	48	.....	.....
45	Steel wheel manufactory	1	1	135	.....	.....	.....	.....	.....	59,256	111,128	50	.....	.....	47	.....	.....
46	Street railway	1	1	151	.....	.....	.....	.....	.....	60,000	83,935	52	.....	.....	.....	.....	.....
47	Shoes and boots, retail	1	1	4	.....	.....	.....	.....	.....	9,124	9,405	52	.....	.....	.....	.....	.....
48	Show case and fixtures manufactory	1	1	.....	.....	.....	.....	.....	.....	5,000	.....	.....	.....	.....	.....	.....	.....
49	Sugar refining and corn products	1	1	216	.....	.....	.....	.....	.....	35,000	128,947	20	.....	.....	32	46	3
50	Telephone exchange	1	1	14	18	.....	9	15	.....	8,644	8,400	52	.....	.....	.....	.....	.....
51	Telephone, general office	1	1	.....	.....	.....	.....	.....	.....	17,905	21,082	52	.....	.....	.....	.....	.....
52	Transfer and express	1	1	12	.....	.....	.....	.....	.....	6,160	8,656	52	.....	.....	.....	.....	.....
53	Vinegar and pickle manufactory	1	1	31	.....	.....	.....	.....	.....	16,346	15,947	52	.....	.....	.....	.....	.....
54	Water works	1	1	14	.....	.....	.....	.....	.....	14,203	13,243	52	.....	.....	.....	.....	.....
55	Wholesale boots and shoes	1	1	15	.....	.....	.....	.....	.....	3,197	15,700	52	.....	.....	.....	.....	.....
56	Wholesale crockery and queensware	1	1	11	.....	.....	.....	.....	.....	6,500	8,400	52	.....	.....	.....	.....	.....
57	Wholesale fruit and produce	1	1	15	.....	.....	.....	.....	.....	10,479	15,899	52	.....	.....	.....	.....	.....
58	Wholesale glass	1	1	52	.....	.....	.....	.....	.....	41,800	29,556	52	.....	.....	.....	.....	.....
59	Wholesale groceries	1	1	52	.....	.....	.....	.....	.....	37,500	38,535	52	.....	.....	.....	.....	.....
60	Wholesale hardware	1	1	15	.....	.....	.....	.....	.....	8,100	13,000	52	.....	.....	.....	.....	.....
61	Wholesale oils and its products	1	1	49	.....	.....	.....	.....	.....	9,000	8,000	52	.....	.....	.....	.....	.....
62	Wholesale saddlery and harness	1	1	1	.....	.....	.....	.....	.....	3,000	.....	52	.....	.....	.....	.....	.....
63	Woolen factory	1	1	30	75	.....	20	60	.....	32,911	26,379	52	.....	.....	44	7	1
	Total	84	109	2,370	900	51	3,282	1,086	60	\$ 1,111,296	\$ 1,710,691	47	4	1	48	3	1	
	Average	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

SIoux COUNTY.

1	Hotel	1	1	1	5	.....	1	4	.....	\$ 700	\$ 850	52	.....	.....	52	.....	.....
2	Grain and milling	1	1	11	.....	.....	14	4	.....	\$ 5,010	\$ 6,694	50	.....	.....	2	52	.....
	Total	2	2	12	5	.....	15	4	.....	\$ 5,710	\$ 7,484	51	.....	.....	1	52	.....
	Average	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

STORY COUNTY.

1	Brick and tile	1	1	6	.....	.....	.....	.....	.....	\$ 1,669	.....	20	12	50	.....	.....	.....
2	Dry goods, retail	1	1	2	4	.....	1	4	.....	1,750	\$ 1,664	52	.....	.....	52	.....	.....
3	General merchandise	1	1	.....	.....	.....	.....	.....	.....	2,220	.....	52	.....	.....	.....	.....	.....
4	Hotel	1	1	.....	.....	.....	.....	.....	.....	400	.....	.....	.....	.....	.....	.....	.....
5	Wholesale butter and eggs	1	1	20	.....	.....	16	.....	.....	8,000	7,500	52	.....	.....	.....	.....	.....
	Total	4	3	31	6	.....	18	8	.....	\$ 12,003	\$ 9,664	44	3	5	44	.....	.....
	Average	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TAMA COUNTY.

1	Brick and tile manufactories	4	4	47	1	.....	51	7	.....	\$ 12,706	\$ 13,200	31	.....	.....	21	32	.....	20
2	Hotels	1	1	5	10	.....	7	10	.....	3,000	2,400	52	.....	.....	.....	52	.....	.....
3	Milling and broom manufactory	1	1	12	.....	.....	12	.....	.....	2,400	4,600	34	.....	.....	18	42	.....	10
4	Straw board and egg case manufactory	1	1	75	100	.....	75	100	.....	15,100	29,963	35	.....	.....	17	52	.....	.....
	Total	8	8	139	111	.....	145	111	.....	\$ 35,206	\$ 47,263	37	.....	.....	15	40	.....	12
	Average	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TAYLOR COUNTY.

1	Banking and creamery	1	1	.....	.....	.....	6	2	.....	\$ 3,700	.....	.....	.....	.....	52	.....	.....
2	Brick manufactory	1	1	.....	.....	.....	8	.....	.....	1,440	.....	.....	.....	.....	26	.....	.....
3	Contracting	1	1	.....	.....	.....	.....	.....	.....	500	.....	.....	.....	.....	14	.....	.....
4	Hotels	1	1	.....	.....	.....	.....	.....	.....	972	.....	.....	.....	.....	.....	.....	.....
5	Mining coal	2	1	44	.....	.....	18	.....	.....	\$ 14,770	\$ 6,694	30	8	14	28	.....	.....
6	Printing, publishing and postoffice	1	1	.....	.....	.....	7	.....	.....	1,992	3,060	52	.....	.....	52	.....	.....
	Total	3	6	46	2	.....	47	5	2	\$ 16,792	\$ 15,356	52	5	9	38	.....	.....
	Average	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

UNION COUNTY.

1	Contracting	1	1	6	.....	.....	.....	.....	.....	\$ 3,600	.....	52	.....	.....	.....	.....	.....
2	Furniture, carpets and undertaking	1	1	.....	.....	.....	5	.....	.....	2,280	.....	.....	.....	.....	52	.....	.....
3	Gas and electric light	1	1	.....	.....	.....	.....	.....	.....	.....	2,500	.....	.....	.....	.....	.....	.....
4	Hotels	2	6	4	10	.....	.....	.....	.....	945	9,822	40	.....	.....	15	52	.....
5	Laundries	1	1	3	.....	.....	4	.....	.....	468	3,220	52	.....	.....	.....	.....	.....
6	Mfg. blank books, printing and stationery	1	1	.....	.....	.....	20	10	.....	.....	15,000	.....	.....	.....	.....	.....	.....
7	Publisher	1	1	.....	.....	.....	7	.....	.....	3,350	.....	.....	.....	.....	.....	.....	.....
8	Wholesale grocery	1	1	6	.....	.....	.....	.....	.....	3,150	.....	.....	.....	.....	.....	.....	.....
	Total	6	12	24	14	.....	64	56	8	\$ 9,871	\$ 37,292	48	.....	.....	4	52	.....
	Average	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

VAN BUREN COUNTY.

Line No.	KIND OF BUSINESS.	NO. REPORTING, 1897.		NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.			NO. WEEKS IN OPERATION, 1898.		
		No. reporting, 1897.	No. reporting, 1898.	Males.	Females.	Apprentices.	Males.	Females.	Apprentices.			Full time, full force.	Short time, reduced force.	Suspended.	Full time, full force.	Short time, reduced force.	Suspended.
1	Cigar manufactory	1	1	7	.....	2	19	1	4	\$ 3,133	\$ 5,764	20	32	.....	52	.....	.....
2	Coal mining	1	1	8	.....	.....	13	.....	.....	3,200	6,240	48	4	.....	42	10	.....
3	Hotel	1	1	.....	.....	.....	3	6	.....	1,970	.....	.....	.....	.....	52	.....	.....
4	Woolen mills	1	2	35	35	.....	107	78	.....	13,172	49,993	20	24	8	25	25	2
	Total	3	5	50	35	2	142	85	4	\$ 19,505	\$ 63,667	29	20	3	39	12	1
	Average																

WAPELLO COUNTY.

1	Blank book manufactory	1	1	9	3	1	6	4	.....	\$ 6,408	\$ 6,000	30	22	.....	46	6	.....
2	Carriage and wagon manufactories	1	1	12	.....	.....	6	.....	.....	5,921	3,124	36	16	.....	40	12	.....
3	Cigar manufactories	6	7	64	75	12	87	88	19	46,368	59,806	49	2	1	42	6	4
4	Clothing, wholesale and retail	1	2	7	.....	.....	17	2	.....	4,500	.....	52	.....	.....	52	.....	.....
5	Coal mining	8	6	474	.....	.....	479	.....	.....	185,505	204,123	30	16	6	84	9	9
6	Cooperage and poultry	1	1	5	15	.....	40	30	.....	8,868	5,878	9	48	.....	16	36	.....
7	Dry goods and millinery	4	4	25	31	.....	28	43	.....	24,853	27,883	52	.....	.....	52	.....	.....
8	Flour, feed and grain	1	1	5	.....	.....	.....	.....	.....	2,580	.....	52	.....	.....	.....	.....	.....
9	Foundry and machine work	3	3	116	12	.....	125	12	.....	61,544	44,854	37	15	.....	49	2	1
10	Furniture, wholesale and retail	1	1	6	1	.....	10	2	.....	2,500	5,075	52	.....	.....	52	.....	.....
11	Gas manufactory	1	1	6	.....	.....	6	.....	.....	5,082	6,000	52	.....	.....	52	.....	.....
12	Hotels and restaurants	4	8	30	37	.....	45	51	.....	13,316	20,198	52	.....	.....	52	.....	.....
13	Ice, wood and coal, retail	2	3	37	.....	.....	36	.....	.....	2,900	12,825	50	.....	12	32	12	8
14	Laundries	2	2	20	47	.....	24	46	.....	19,717	22,188	52	.....	.....	52	.....	.....
15	Linsed oil manufactory	1	1	14	.....	.....	.....	.....	.....	4,732	.....	52	.....	26	.....	.....	.....
16	Newspaper publishers	2	1	36	4	5	10	2	2	18,240	10,000	52	.....	.....	52	.....	.....
17	Paving and building brick	1	1	.....	.....	.....	100	.....	.....	35,000	.....	.....	.....	.....	32	.....	20
18	Pickle manufactory	1	1	5	4	.....	4	5	.....	2,000	2,000	16	36	.....	16	36	.....
19	Pork packing	1	1	950	.....	.....	1,000	.....	.....	299,500	325,000	40	12	.....	26	26	.....
20	Sewing machine attachment manufactory	1	1	37	61	1	.....	.....	.....	34,729	.....	52	.....	.....	52	.....	.....
21	Street railway and electric light	1	1	50	.....	.....	45	.....	.....	23,324	24,440	52	.....	.....	52	.....	.....
22	Telephone exchange	1	1	3	5	2	4	5	.....	3,000	3,600	52	.....	.....	52	.....	.....
23	Transfer, livery and dray	2	2	40	.....	.....	43	.....	.....	18,042	19,244	52	.....	.....	52	.....	.....
24	The City Water company	1	1	8	1	.....	9	1	.....	7,080	6,840	52	.....	.....	52	.....	.....

25	Wholesale beer	1	3	12	.....	.....	18	.....	.....	4,680	6,000	52	.....	.....	42	10	.....
26	Wholesale butter, eggs and fruits	1	3	31	1	.....	31	.....	.....	15,023	16,185	40	12	.....	27	25	.....
27	Wholesale confections	1	1	15	15	.....	17	23	6	5,000	7,200	45	7	.....	47	5	.....
28	Wholesale drugs and stationery	1	1	22	3	.....	24	3	.....	19,351	19,218	52	.....	.....	52	.....	.....
29	Wholesale groceries	2	2	37	2	.....	33	2	.....	28,220	23,600	52	.....	.....	52	.....	.....
30	Wholesale and retail hardware	2	2	28	1	.....	37	1	.....	15,200	22,816	52	.....	.....	52	.....	.....
31	Wool, hides and tanners	1	1	5	1	.....	5	1	.....	3,590	4,268	52	.....	.....	52	.....	.....
	Total	59	61	2,109	319	22	2,279	321	27	\$ 890,683	\$ 952,615	44	6	2	42	8	2
	Average																

WARREN COUNTY.

1	Coal mining	4	2	42	.....	.....	15	.....	.....	\$ 15,625	\$ 3,400	24	12	16	28	12	12
2	Dry goods, retail	1	1	.....	.....	.....	4	2	1	4,000	2,500	52	.....	.....	.....	.....	.....
3	Hotel	1	1	3	2	.....	.....	.....	.....	885	.....	52	.....	.....	.....	.....	.....
	Total	6	3	50	4	1	19	2	1	\$ 20,510	\$ 5,900	28	12	12	36	8	8
	Average																

WASHINGTON COUNTY.

1	Brick and tile manufactory	1	1	7	.....	.....	12	.....	.....	\$ 2,000	\$ 2,343	31	.....	21	32	.....	20
2	Carriage manufactory	1	1	8	.....	.....	8	.....	.....	3,373	3,715	36	.....	16	48	4	.....
3	Hotel	1	1	5	12	.....	5	11	.....	2,922	2,700	52	.....	.....	52	.....	.....
4	Printing and publishing	1	1	14	1	1	6	.....	1	2,500	1,300	52	.....	.....	52	.....	.....
	Total	4	4	34	13	1	31	11	1	\$ 10,795	\$ 10,058	43	.....	9	46	1	5
	Average																

WAYNE COUNTY.

1	Brick and tile manufactory	1	1	25	.....	.....	6	.....	.....	\$ 6,000	\$ 1,500	26	.....	25	20	.....	32
2	Coal mining	2	2	218	.....	.....	265	.....	.....	65,387	61,787	42	6	3	40	6	6
	Total	3	3	253	.....	.....	271	.....	.....	\$ 71,387	\$ 63,287	34	3	15	33	4	15
	Average																

WEBSTER COUNTY.

1	Agricultural implements and seeds	1	1	8	.....	.....	6	.....	.....	\$ 4,000	\$ 3,500	52	.....	.....	52	.....	16
2	Brick and tile manufactories	4	4	110	1	.....	92	1	.....	25,470	23,350	32	.....	20	52	8	.....
3	Clothing and tailoring	3	2	38	3	4	33	6	4	19,050	18,299	52	.....	.....	52	.....	.....
4	Coal mining and retail	6	4	334	.....	.....	223	.....	.....	120,409	92,603	33	15	4	32	12	8
5	Contractor and builder	1	1	16	.....	.....	15	.....	.....	3,000	5,000	52	20	.....	52	.....	.....
6	Dry goods, etc	1	1	3	2	.....	4	5	.....	1,950	2,200	52	.....	.....	52	.....	.....
7	Foundry and machine shop	1	1	5	.....	.....	7	.....	.....	720	3,700	52	.....	43	52	.....	.....
8	Gas and electric light	1	1	9	.....	.....	12	.....	.....	5,100	8,350	52	.....	.....	52	.....	.....

WEBSTER COUNTY—CONTINUED.

Line No.	KIND OF BUSINESS.	No. reporting, 1897.		NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS IN OPERATION, 1897.		NO. WEEKS IN OPERATION, 1898.			
		No. reporting, 1897.	No. reporting, 1898.	Males.	Females.	Apprentices.	Males.	Females.	Apprentices.			Full time, full force.	Short-time reduced force.	Suspended.	Full time, full force.	Short-time reduced force.	Suspended.
9	General merchandise.	1	1	4	3	2	7	13	2,000	3,900	52	52	52	52			
10	Hotel	1	1	1	1	1	1	1	1,500	1,500	52	52	52	52			
11	Laundry	1	1	2	2	2	2	2	6,321	6,321	52	52	52	52			
12	Printing and binding	1	1	2	2	2	2	2	12,268	12,268	52	52	52	52			
13	Oil meal mill	1	1	32	32	32	58	10	19,000	21,437	45	45	52	52			
14	Planing mill	1	1	50	70	70	12	50	4,708	5,183	48	48	52	10			
15	Shoe manufactory	1	1	1	1	1	1	1	40,880	40,880	40	40	52	52			
16	Stoneware manufactory.	1	1	1	1	1	20	20	5,134	6,532	38	38	40	12			
17	Stucco and plaster manufactories.	1	1	75	3	3	67	7	29,987	25,784	74	74	40	12			
18	Transfer and dray	1	1	1	1	1	1	1	3,400	3,317	45	45	52	52			
19	Wholesale fruits	1	1	1	1	1	1	1	1,038	8,038	52	52	52	52			
20	Wholesale groceries	1	1	1	1	1	1	1	17,112	21,107	52	52	52	52			
21	Wholesale and retail hardware	1	1	1	1	1	1	1	5,238	4,763	52	52	52	52			
22	Wholesalers and manufacturers of paint.	1	1	1	1	1	1	1	4,763	4,763	40	40	12	12			
	Total	34	29	778	136	6	718	102	5	\$ 330,187	\$ 321,080	43	5	4	43	5	4
	Average																

WINNESHIEK COUNTY.

1	Clothing, retail.	1	1	7	7	7	7	7	8,500	8,400	52	52	52	52		
2	Dry goods, carpets, cloaks and shoes.	1	1	6	13	6	15	6	7,891	8,494	52	52	52	52		
3	General merchandise.	1	1	5	6	5	7	5	4,300	3,600	52	52	52	52		
4	Hotels and livery	1	1	40	13	4	12	12	2,140	1,983	52	52	52	52		
5	Publishing, printing and binding.	1	1	9	4	38	9	6	23,857	25,000	52	52	52	52		
6	Sash, door, blind, manufactory fishings.	1	1	22	30	30	30	30	11,800	11,800	35	17	42	10		
7	Wagon and sleigh mfg. and repairing	1	1	1	1	3	15	2	2,854	4,000	35	17	42	10		
8	Windmill and tank manufactory	1	1	19	19	19	19	19	5,719	5,719	50	50	50	50		
	Total	12	10	119	41	7	106	48	8	\$ 67,074	\$ 69,882	49	3	51	1	
	Average															

WOODBURY COUNTY.

1	Agricultural implement manufactories.	2	2	20	20	20	20	20	\$ 10,148	\$ 12,530	52	52	50	3	
2	Aerated water manufactory	1	1	6	6	6	6	6	2,680	2,030	52	52	39	13	
3	Bakery	1	2	6	11	11	11	11	4,283	6,897	52	52	39	18	
4	Box factory (paper)	1	1	3	12	3	15	3	2,000	3,400	52	52	52	52	
5	Brick and tile manufactories.	5	5	183	173	173	173	173	46,922	20	3	23	28	4	20
6	Candy manufactory	1	1	11	64	11	64	11	31,492	31,492	52	52	4	6	
7	Clothing manufactory	1	1	37	10	80	3	3	18,200	25,460	51	51	51	1	
8	Cigar manufactories.	3	3	23	3	38	3	3	13,967	19,927	52	52	52	52	
9	Coal, lime and cement	2	1	12	1	1	1	1	8,000	8,000	52	52	52	52	
10	Clothing, retail.	2	2	12	12	12	12	12	14,615	33,847	52	52	52	52	
11	Contractors and builders	3	1	42	10	3	3	3	22,000	6,290	22	11	10	51	
12	Crockery, china and glassware	1	1	3	3	3	3	3	4,400	4,400	52	52	52	52	
13	Coopering	1	1	4	4	4	4	4	1,440	4,641	52	52	52	52	
14	Dry goods, retail.	3	4	42	48	55	63	52	43,241	46,641	52	52	52	52	
15	Florist and cut flowers	1	1	4	4	4	4	4	4,300	7,474	52	52	52	52	
16	Foundries, iron and boiler works.	2	4	15	44	1	2	2	8,322	23,313	40	12	30	14	
17	Furniture, retail.	1	1	37	10	108	10	10	6,280	6,280	52	52	52	52	
18	General department stores	1	1	37	58	18	6	6	8,000	8,000	52	52	52	52	
19	General merchandise	1	3	45	45	18	6	6	20,033	16,006	52	52	52	52	
20	Groceries, retail	6	2	25	6	12	1	1	16,821	8,790	52	52	52	52	
21	Hotels and restaurants	10	8	110	96	77	91	91	50,954	53,613	52	52	52	52	
22	Insurance, life.	1	1	14	15	5	5	5	13,044	14,646	52	52	52	52	
23	Jeweler and diamond setter	1	1	7	7	7	7	7	5,000	6,000	52	52	52	52	
24	Laundries	1	3	6	16	17	1	1	4,500	7,948	40	12	40	12	
25	Light and power	1	1	15	23	2	2	2	7,200	12,572	52	52	52	52	
26	Lined oil mill	1	1	15	22	22	22	22	12,592	12,592	52	52	52	52	
27	Livery	1	1	15	14	14	14	14	7,800	8,800	52	52	52	52	
28	Mattress and tent manufactory	1	3	8	5	5	5	5	5,313	4,591	40	12	35	17	
29	Merchant tailoring	3	3	24	14	38	2	1	31,226	21,691	52	52	31	13	
30	Milling and grist	4	4	97	16	93	15	15	46,222	46,712	36	14	5	52	
31	Nursery and seeds	1	1	10	15	10	10	10	6,000	6,000	32	20	5	52	
32	Papering and painting	1	1	16	10	34	12	12	10,000	10,000	52	52	40	12	
33	Produce and warehouse	1	1	5	5	5	5	5	15,495	15,495	40	12	52	52	
34	Publishing, printing and binding.	4	6	306	35	1	21	2	144,274	166,110	52	52	52	52	
35	Plumbing and heating.	1	1	7	14	14	14	14	7,901	7,901	36	14	52	52	
36	Pork packing	1	1	30	35	15	15	15	28,731	28,731	52	52	52	52	
37	Saddlery and harness manufactory.	1	1	1	1	1	2	2	2,761	6,179	52	52	52	52	
38	Soap factory	1	1	22	8	20	8	8	6,856	8,101	52	26	14	52	
39	Starch factory	1	1	45	31	74	52	52	30,828	49,648	52	52	52	52	
40	Stock and feed yards	1	1	55	81	81	81	81	41,844	51,328	48	4	40	12	
41	Street railways	4	2	2	2	2	2	2	63,557	53,796	52	52	52	52	
42	Tannery	1	1	4	6	6	6	6	1,500	3,000	40	12	35	17	
43	Telephone exchange	2	2	17	34	16	35	35	19,011	20,250	52	52	52	52	
44	Transportation, baggage, etc.	1	1	1	1	1	1	1	1,334	8,049	52	52	52	52	
45	Vinegar, pickles, etc.	1	1	1	1	1	1	1	6,980	6,180	40	12	52	52	
46	Water-works	1	1	15	13	13	13	13	10,405	10,404	52	52	52	52	
47	Wholesale cigars and tobacco	1	1	35	35	35	35	35	9,400	15,798	52	52	52	52	
48	Wholesale and retail drugs.	2	2	38	4	4	4	4	20,200	20,200	52	52	52	52	

WOODBURY COUNTY—CONTINUED.

Line No.	KIND OF BUSINESS.	NO. REPORTING, 1897.		NO. EMPLOYED, 1897.			NO. EMPLOYED, 1898.			Amount of wages paid out in 1897.	Amount of wages paid out in 1898.	NO. WEEKS 'N OPERATION, 1897.			NO. WEEKS 'N OPERATION, 1898.		
		No. reporting.	1898.	Males.	Females.	Apprentices.	Males.	Females.	Apprent. cas.			Full time, full force.	Short time re-duced force.	Suspended.	Full time, full force.	Short time, re-duced force.	Suspended.
49	Wholesale dry goods.....	1	1	15	1	.....	15	2	.....	10,000	12,000	52	.....	.....	52	.....	.....
50	Wholesale fruits and confections.....	2	2	20	4	.....	33	3	.....	23,200	26,512	52	.....	.....	52	.....	.....
51	Wholesale groceries.....	4	4	197	35	.....	217	30	.....	146,356	148,716	52	.....	.....	52	.....	.....
52	Wholesale hardware.....	3	3	81	7	.....	83	8	.....	64,417	58,536	52	.....	.....	52	.....	.....
53	Wholesale ice.....	1	1	24	1	.....	24	1	.....	3,000	3,000	33	.....	16	33	.....	16
54	Wholesale liquors.....	3	3	24	.....	.....	24	.....	.....	15,368	17,466	52	.....	.....	52	.....	.....
55	Wholesale oils and greases.....	1	1	10	1	.....	9	3	.....	9,950	8,524	52	.....	.....	52	.....	.....
56	Wholesale saddlery.....	1	1	12	.....	.....	15	.....	.....	5,375	7,360	52	.....	.....	52	.....	.....
57	Wholesale toys and stationery.....	1	1	7	1	.....	8	2	.....	5,000	6,000	52	.....	.....	52	.....	.....
58	Wholesale sash, doors and lumber.....	.....	.....	.....	.....	.....	41	.....	.....	.....	18,504	.....	.....	.....	47	.....	5
59	Wholesale wall paper.....	.....	.....	.....	.....	.....	16	2	.....	.....	12,800	.....	.....	.....	30	.....	.....
60	Wool, hides and tallow.....	.....	.....	.....	.....	.....	6	.....	.....	.....	4,532	.....	.....	.....	52	.....	.....
Total.....		99	112	2,068	557	12	2,675	635	19	\$ 1,290,317	\$ 1,572,954	49	2	1	49	2	1
Average.....																	
WORTH COUNTY.																	
1	Grain and farm implements.....	1	1	14	.....	.....	9	.....	.....	\$ 5,640	\$ 4,980	52	.....	.....	52	.....	.....
2	Wagon and sleigh manufactory.....	1	.....	6	.....	.....	.....	.....	.....	1,800	.....	52	.....	.....	.....	.....	.....
Total.....		2	1	20	.....	.....	9	.....	.....	\$ 8,440	\$ 4,980	52	.....	.....	52	.....	.....
Average.....																	
WRIGHT COUNTY.																	
1	Brick and tile manufactory.....	1	1	6	.....	.....	6	.....	.....	\$ 1,528	\$ 1,600	28	.....	24	28	.....	24
2	Printing and publishing.....	1	.....	4	1	.....	.....	.....	.....	1,750	.....	52	.....	.....	.....	.....	.....
3	Hotels.....	.....	.....	2	.....	.....	1	10	.....	.....	2,188	.....	.....	.....	52	.....	.....
Total.....		2	3	10	1	.....	7	10	.....	\$ 3,278	\$ 3,688	40	.....	12	44	.....	8
Average.....																	

RECAPITULATION OF

Number.	KIND OF BUSINESS	NO. EMPLOYED —1896.		NO. EMPLOYED —1897.		NO. EMPLOYED —1896.		NO. EMPLOYED —1897.		
		No. reporting—1896.	No. reporting—1897.	No. reporting—1896.	No. reporting—1897.	Males.	Females.	Males.	Females.	
1	Agricultural implement mfrs.	16	11	10	267	5	7	384	3	2
2	Aggr. impts., wholesale and retail	20	21	22	205	5	5	224	36	2
3	Art glass and show case mfrty.	1	2	1	1	21	5	22	1	1
4	Bag (paper) manufactories.	1	2	3	14	23	15	2	1	1
5	Bakers.	11	9	11	73	29	4	68	18	3
6	Barrel manufactory.	1	1	1	12	1	1	21	1	1
7	Barricade manufactories.	1	1	1	48	54	3	54	3	1
8	Beer manufactories.	2	2	2	112	1	1	152	2	1
9	Bicycles, retail.	2	2	2	12	1	1	10	1	1
10	Blacksmith.	1	1	1	12	1	1	11	1	1
11	Boiler manufactories.	3	3	5	7	7	7	9	6	6
12	Books and stationery, retail.	1	1	2	7	7	7	13	2	2
13	Books and stationery, wholesale.	1	1	1	14	1	1	17	1	1
14	Boot and shoe manufactories.	6	7	6	118	164	27	273	256	60
15	Boots and shoes, retail.	4	5	4	35	9	1	34	6	1
16	Boots and shoes, wholesale.	1	1	3	47	3	1	41	4	1
17	Bottlers.	10	6	4	84	5	3	41	1	1
18	Box (paper) manufactories.	19	8	8	225	52	4	137	61	1
19	Brass goods manufactory.	1	1	1	70	1	1	69	1	1
20	Brick and tile manufactories.	121	81	68	1,712	3	5	1,504	2	1
21	Broom and brush manufactories.	6	6	5	78	7	15	75	10	8
22	Ruston manufactory.	1	5	10	40	100	1	188	155	1
23	Canning vegetables.	14	11	13	883	879	1	865	820	1
24	Cann (tin) manufactory.	1	1	1	99	55	1	60	65	1
25	Carrriage and wagon manufactories.	27	25	25	1,149	10	1	1,122	34	4
26	Cigar manufactories.	45	36	40	367	346	67	350	348	32
27	Cigars, wholesale.	14	4	3	1	48	1	48	1	1
28	Clothing manufactories.	14	4	11	520	955	5	243	1,038	10
29	Clothing, retail.	28	25	17	4	252	17	4	15	12
30	Coal mining.	151	150	87	8,938	3	1	8,934	3	1
31	Coal wood and ice, ret. and wholesale	1	1	1	1	1	1	1	1	1
32	Coffin and casket manufactories.	3	4	3	105	17	3	178	68	4
33	Copperage manufactories.	1	1	1	151	1	1	151	1	1
34	Contractors and builders.	24	12	11	1,053	2	2	238	15	4
35	Jordage and twine manufactory.	1	1	1	1	1	1	1	1	1
36	Cornice manufactories.	1	1	1	1	1	1	1	1	1
37	Cracker and candy mfrs. and sale.	14	16	20	241	264	9	297	219	20
38	Creamery supplies, manufactories.	2	2	2	3	7	4	5	4	1
39	Crockery, retail.	4	4	19	18	48	1	48	1	1
40	Crockery, wholesale.	7	5	6	78	14	2	61	14	2
41	Ditcher manufactory.	1	1	1	1	1	1	22	9	1
42	Drugs, retail.	1	1	1	6	4	1	8	4	1
43	Drugs, wholesale.	12	9	10	155	15	14	148	16	6
44	Dry goods, retail.	77	69	90	743	723	19	747	920	37
45	Dry goods, wholesale.	5	4	2	74	62	16	78	40	2
46	Egg case filler manufactories.	3	2	2	200	1	1	130	8	1
47	Electric supplies manufactories.	2	1	1	12	1	1	6	1	1
48	Engines and electropwr.	1	1	1	42	1	1	10	1	1
49	Farm tool manufactories.	8	2	3	42	1	1	24	1	1
50	Feather duster manufactory.	1	1	1	15	22	30	30	30	30
51	Floral.	1	1	1	1	1	1	1	1	1
52	Fire and life insurance.	20	19	18	225	10	10	219	38	1
53	Foundries and machine shops.	46	35	33	1,046	26	71	1,038	26	41
54	Furniture manufactories.	21	14	13	664	38	16	560	8	1
55	Furniture, retail.	13	7	12	97	17	7	90	5	1
56	Furniture, wholesale.	1	2	2	651	5	9	869	11	1
57	Furs, retail.	1	1	1	1	1	1	1	1	1
58	Gas and electric light.	19	15	20	852	8	8	859	9	1
59	Gasoline engine manufactories.	1	1	1	1	1	1	1	1	1
60	General merchandises.	23	19	2	118	4	71	154	5	1
61	Glove manufactories.	3	2	3	63	99	9	97	60	1
62	Glucose manufactories.	1	2	2	350	1	1	156	56	1

THE ENTIRE STATE.

NO. EMPLOYED —1896.	NO. EMPLOYED —1897.	Amount of wages paid—1896.	Amount of wages paid—1897.	WEEKS IN OPERATION —1896.			WEEKS IN OPERATION —1897.			WEEKS IN OPERATION —1898.				
				Full force.	Short force.	Suspended.	Full force.	Short force.	Suspended.	Full force.	Short force.	Suspended.		
484	511	113,410	222,889	125,213	30	15	7	29	10	3	44	5	3	
274	31	182,860	180,839	224,672	50	2	1	62	10	3	62	10	3	
42	31	1,871	1,871	5,000	36	11	1	32	11	1	32	11	1	
73	23	10,035	16,635	22,425	38	1	1	32	1	1	32	1	1	
14	1	38,664	33,723	45,670	52	1	1	57	1	1	51	1	1	
62	46	2,000	6,296	5,624	23	1	1	24	31	15	6	32	5	15
155	22	15,863	5,364	20,129	14	6	3	11	3	44	5	8	4	
229	22	9,383	98,383	93,823	45	3	4	52	1	1	52	1	1	
10	10	1,000	5,300	12,822	16	36	1	52	1	1	44	8	1	
92	10	3,850	3,186	4,725	62	1	1	17	15	20	32	1	1	
27	11	10,202	31,209	44,667	30	23	1	47	5	4	44	8	1	
354	194	2,150	7,987	18,500	32	1	1	45	10	32	44	8	1	
42	19	4,100	12,900	15,800	32	1	1	32	1	1	32	1	1	
44	4	184,416	32,507	108,831	38	4	10	46	5	1	42	9	1	
31	1	28,014	22,513	36,237	32	1	1	32	1	1	32	1	1	
171	49	55,418	28,403	28,396	52	14	6	52	1	1	52	1	1	
14	1	39,942	16,885	12,343	37	15	1	33	14	3	38	14	1	
1,744	2	171	47,550	47,531	52	1	1	51	1	1	50	1	1	
1,065	1,113	15,709	5,909	7,363	63	7	1	62	1	1	62	1	1	
394	287	321,499	414,911	462,588	16	7	29	24	6	22	27	4	21	
1,005	1,113	27,013	23,884	29,863	30	10	5	45	4	5	40	8	4	
394	287	30,230	73,112	170,580	52	11	36	34	10	41	31	14	25	
1,005	1,113	46,924	58,254	100,893	5	11	36	10	15	27	13	14	25	
1,200	37	11,203	19,712	19,712	22	30	29	25	26	1	26	6	10	
470	402	282,012	331,913	428,900	29	22	1	42	9	1	41	10	1	
38	11	338,865	248,712	229,489	46	3	3	45	1	1	45	5	2	
328	1,096	57,522	42,719	41,549	32	7	6	47	2	3	46	5	1	
328	1,096	328,579	331,270	340,217	39	7	6	47	2	3	46	5	1	
300	39	151,191	161,708	199,624	62	15	5	62	1	7	35	18	7	
1,397	3	3,375,151	3,445,196	3,628,928	18	1	1	18	1	1	18	1	1	
367	1	95,693	82,669	70,123	38	14	14	42	7	3	44	17	1	
153	25	58,467	78,928	64,748	37	15	1	48	3	1	43	14	1	
211	31	60,303	33,328	60,303	34	15	3	42	9	1	42	4	1	
237	2	118,427	113,965	100,905	33	17	3	33	16	3	32	13	7	
6	1	735	4,000	3,000	30	16	2	32	16	2	32	16	2	
423	321	208,908	161,861	248,424	33	10	8	41	10	1	41	11	1	
63	3	34,581	219,900	14,676	44	7	1	52	16	1	52	16	1	
12	12	34,931	34,931	44,744	4	1	1	4	1	1	4	1	1	
89	12	54,148	43,830	45,900	62	1	1	62	1	1	62	1	1	
24	3	3,300	3,300	3,300	62	1	1	62	1	1	62	1	1	
151	13	2,370	14,440	13,544	62	1	1	62	1	1	62	1	1	
150	13	135,001	115,788	114,720	62	1	1	62	1	1	62	1	1	
1,506	300	685,000	708,547	708,547	62	16	10	62	16	10	62	16	10	
7	1	58,428	31,440	18,500	62	1	1	62	1	1	62	1	1	
70	119	47,143	21,540	31,218	14	10	8	17	62	17	62	17	62	
11	1	5,147	5,000	5,000	62	1	1	62	1	1	62	1	1	
110	2	11,997	9,238	34,599	36	19	52	52	39	19	52	39	19	
30	40	1,533	5,698	6,166	40	12	43	9	12	43	9	12	43	
14	2	4,306	4,306	7,494	62	1	1	62	1	1	62	1	1	
216	48	232,360	390,820	255,748	62	4	2	62	4	2	62	4	2	
1,177	62	487,997	474,833	472,295	33	23	4	32	41	6	32	41	6	
638	16	226,144	146,017	150,295	33	23	4	41	7	1	41	7	1	
97	13	51,471	31,390	58,540	49	3	52	52	52	52	52	52	52	
88	10	27,341	31,074	27,341	62	20	52	52	52	52	52	52	52	
480	10	177,982	20,200	265,022	51	1	1	50	1	1	50	1	1	
205	123	70,622	103,598	103,713	62	6	62	62	62	62	62	62	62	
91	129	35,167	35,167	73,651	36	10	6	45	6	45	45	6	45	
331	54	127,793	97,073	161,121	62	10	6	30	6	16	45	7	1	

RECAPITULATION OF THE

Number.	KIND OF BUSINESS.	No. reporting—1896.			NO. EMPLOYED—1896.			NO. EMPLOYED—1897.		
		No. reporting—1896.	No. reporting—1897.	No. reporting—1898.	Males.			Males.		
					Females.	Apprentices.	Females.	Apprentices.		
65	Groceries, retail.	8	11	10	83	7	2	104	20	1
64	Groceries, wholesale.	48	44	46	847	66	2	855	76	3
65	Hardware, wholesale.	1	1	1	1	1	1	53	4	1
66	Hardware, retail.	1	1	1	1	1	1	333	31	1
67	Hardware, retail.	23	20	19	411	27	9	482	31	1
68	Harness and saddlery manufactures.	12	12	12	135	9	8	162	9	5
69	Heating apparatus manufactures.	3	3	3	24	1	1	21	2	1
70	Hides, tallow and wool.	3	3	3	31	1	1	21	2	1
71	Hotels and restaurants.	158	153	150	1,064	1,257	2	960	958	2
72	Iron bridge manufactory.	1	1	1	15	1	1	7	1	1
73	Jeweler, retail.	1	1	1	15	1	1	14	1	1
74	Jeweler, wholesale.	1	1	1	13	1	1	18	1	1
75	Kindling wood manufactory.	1	1	1	15	1	1	25	1	1
76	Knitting works.	1	1	1	15	1	1	25	1	1
77	Laundries.	47	58	58	390	438	1	418	1	1
78	Lime manufactures.	7	6	6	110	1	1	103	1	1
79	Licensed oil manufactures.	5	5	5	113	1	1	105	1	1
80	Livory and transfer lines.	19	19	27	271	2	2	284	2	2
81	Lumber and sawmills.	8	16	16	1,287	1	1	2,359	94	2
82	Lumber, retail.	5	5	5	26	1	1	20	1	1
83	Macaroni manufactory.	1	1	1	15	1	1	40	1	1
84	Marble and granite monuments.	2	2	2	3	1	1	34	10	1
85	Mattress manufactures.	1	1	1	1	1	1	6	1	1
86	Meat market.	1	1	1	1	1	1	6	1	1
87	Medicine (patent) manufactures.	1	1	1	221	37	1	216	37	1
88	Merchant tailors.	26	19	23	234	31	7	159	42	1
89	Milling and grain.	49	55	57	748	117	7	1,036	127	6
90	Millinery, retail.	3	3	3	8	4	4	51	11	6
91	Millinery, wholesale.	3	3	3	48	74	5	47	13	1
92	Monument (bronze) manufactures.	3	3	3	25	1	1	90	77	3
93	Novelty iron works.	1	1	1	306	15	6	198	35	3
94	Nursery and seeds.	1	1	1	1	1	1	35	25	1
95	Oat meal manufactures.	2	2	2	5	5	5	110	32	2
96	Office fixtures manufactures.	13	15	14	181	5	6	228	10	10
97	Painters and paper hangers.	1	1	1	11	3	3	10	1	1
98	Paint manufactory.	1	1	1	1	1	1	10	1	1
99	Paper manufactory.	2	1	1	24	1	1	10	1	1
100	Paper, wholesale.	1	1	1	1	1	1	1	1	1
101	Peanut and coffee roaster mfrs.	1	1	1	1	1	1	1	1	1
102	Perfume and toilet manufactory.	16	15	15	303	2	9	355	2	4
103	Planting mills and lumbers.	18	10	20	163	16	20	139	16	3
104	Plumbers and steam fitters.	1	1	1	1	1	1	23	3	3
105	Pork packers.	1	1	1	1	1	1	80	1	1
106	Printing manufactory.	11	7	10	1,815	19	139	2,151	10	10
107	Publishers, printers and binders.	111	88	106	1,669	390	167	1,962	201	131
108	Pump manufactures.	5	4	4	124	7	7	224	6	6
109	Sash, door and blind mfrs. & lumber	24	23	20	3,712	14	8	3,712	14	8
110	Scale manufactures.	2	2	2	16	1	1	28	1	1
111	Saw manufactures.	1	1	1	1	1	1	1	1	1
112	Sewing attachments manufactory.	1	1	1	67	125	37	61	1	1
113	Sheet iron and tin manufactures.	4	4	4	55	1	1	77	22	22
114	Soap manufactures.	6	6	6	60	16	16	61	2	2
115	Sorghum manufactures.	5	5	5	3	3	3	5	1	1
116	Spring manufactory.	1	1	1	10	1	1	1	1	1
117	Search manufactures.	1	1	1	1	1	1	1	1	1
118	Stock yards.	1	1	1	45	1	1	55	1	1
119	Stone quarries and cutting.	10	9	5	874	1	1	884	1	1
120	Stoneware manufactures.	2	2	2	15	1	1	25	1	1
121	Stove and roofing manufactory.	20	17	13	962	1	1	75	1	1
122	Street railways.	1	1	1	1	1	1	1	1	1
123	Stucco and cement manufactures.	1	1	1	1	1	1	1	1	1

ENTIRE STATE—CONTINUED.

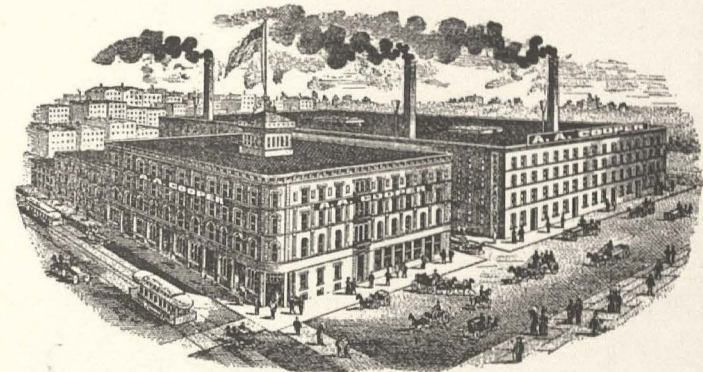
Number.	KIND OF BUSINESS.	NO. EMPLOYED—1896.			Amount of wages paid—1896.	Amount of wages paid—1897.	Amount of wages paid—1898.	WEEKS IN OPERATION—1896.			WEEKS IN OPERATION—1897.			WEEKS IN OPERATION—1898.		
		Males.	Females.	Apprentices.				Full force.	Short force.	Suspended.	Full force.	Short force.	Suspended.	Full force.	Short force.	Suspended.
135		88,330			\$ 38,330		\$ 75,044	53			53			53		
136		747,871			740,953		755,750	20			20			20		
137		3,330			3,330		3,330	32			32			32		
138		306,837			51,891		67,295	49			49			49		
139		291,735			291,735		291,735	3			3			3		
140		51,891			51,891		51,891	20	3		20	3		20	3	
141		58,449			58,449		58,449	2	3		2	3		2	3	
142		8,899			8,899		8,899	15	17		15	17		15	17	
143		14,904			14,904		14,904	4	1		4	1		4	1	
144		800,830			800,830		800,830	51	1		51	1		51	1	
145		7,500			7,500		7,500	18			18			18		
146		5,400			5,400		5,400	3			3			3		
147		10,000			10,000		10,000	53			53			53		
148		2,546			2,546		2,546	13	2		13	2		13	2	
149		20,049			20,049		20,049	4	3		4	3		4	3	
150		173,430			173,430		173,430	43	8		43	8		43	8	
151		32,315			32,315		32,315	27	40		27	40		27	40	
152		53,041			53,041		53,041	21	6		21	6		21	6	
153		161,100			161,100		161,100	50	1		50	1		50	1	
154		807,505			807,505		807,505	28	4		28	4		28	4	
155		19,014			19,014		19,014	48	4		48	4		48	4	
156		18,411			18,411		18,411	39	26		39	26		39	26	
157		14,115			14,115		14,115	28	30		28	30		28	30	
158		16,725			16,725		16,725	28	24		28	24		28	24	
159		22,901			22,901		22,901	46	6		46	6		46	6	
160		2,500			2,500		2,500	52			52			52		
161		115,092			115,092		115,092	52			52			52		
162		105,747			105,747		105,747	38	13		38	13		38	13	
163		412,532			412,532		412,532	40	10		40	10		40	10	
164		63,638			63,638		63,638	19	9		19	9		19	9	
165		58,310			58,310		58,310	52			52			52		
166		11,000			11,000		11,000	27	1		27	1		27	1	
167		8,783			8,783		8,783	20	18		20	18		20	18	
168		53,457			53,457		53,457	43	5		43	5		43	5	
169		36,648			36,648		36,648	30	3		30	3		30	3	
170		60,900			60,900		60,900	29	3		29	3		29	3	
171		4,722			4,722		4,722	1	1		1	1		1	1	
172		63,147			63,147		63,147	32	3		32	3		32	3	
173		8,440			8,440		8,440	5	2		5	2		5	2	
174		6,963			6,963		6,963	52			52			52		
175		9,468			9,468		9,468	30	1		30	1		30	1	
176		10,000			10,000		10,000	22			22			22		
177		158,228			158,228		158,228	32	3		32	3		32	3	
178		140,494			140,494		140,494	37	15		37	15		37	15	
179		153,276			153,276		153,276	14	1		14	1		14	1	
180		815,930			815,930		815,930	10	7		10	7		10	7	
181		53,289			53,289		53,289	30	23		30	23		30	23	
182		1,098,914			1,098,914		1,098,914	32	1		32	1		32	1	
183		123,710			123,710		123,710	28	8		28	8		28	8	
184		1,481,299			1,481,299		1,481,299	15	2		15	2		15	2	
185		7,700			7,700		7,700	52			52			52		
186		5,450			5,450		5,450	14	2		14	2		14	2	
187		34,860			34,860		34,860	48	52		48	52		48	52	
188		31,813			31,813		31,813	42	8		42	8		42	8	
189		5,533			5,533		5,533	4	6		4	6		4	6	
190		3,140			3,140		3,140	53	40		53	40		53	40	
191		137,250			137,250		137,250	49	3		49	3		49	3	
192		51,254			51,254		51,254	30	7		30	7		30	7	
193		128,004			128,004		128,004	36	1		36	1		36	1	
194		8,832			8,832		8,832	36	17		36	17		36	17	
195		3,821			3,821		3,821	43								

RECAPITULATION OF THE

Number.	KIND OF BUSINESS.	No. reporting—1896.	No. reporting—1897.	No. reporting—1898.	NO. EMPLOYED—1896.			NO. EMPLOYED—1897.		
					Males.	Females.	Apprentices.	Males.	Females.	Apprentices.
124	Stock food manufactory.....		1					5		
125	Suspender manufactories.....	3	2	2	21	28		10	36	
126	Syrup manufactories.....	2	1	1	297	2		13	6	
127	Tannery.....	1	1	1	7	3		4	2	
128	Telephone exchanges.....	15	13	14	82	150		77	108	6
129	Tent and awning manufactory.....	1	1	1	17	11		12	6	
130	Tool manufactory.....	1	1	1	12			12	1	
131	Trunk manufactory.....	1	1	1	4	1	1	5	1	1
132	Typewriter manufactory.....	1	1	1	85	2		50		
133	Vinegar and pickle manufactories..	9	7	7	106	75		88	38	
134	Wall paper and oils, retail.....	6	3	3	46	4		41	6	4
135	Water tank manufactories.....	1	1	1	15			59		
136	Waterworks.....	11	8	8	125			100	1	
137	Wholesale butter and eggs.....	13	9	17	266	65		132	1	
138	Wholesale coal and wood.....	1	2	4	14	2		12		
139	Wholesale fruits.....	21	13	15	220	46		172	36	
140	Wholesale leather.....	2	2	2	51	7	5	45		4
141	Wholesale liquors.....	6	6	3	47			59		
142	Wholesale meats.....	2	2	2	13			13		
143	Wholesale oils.....	4	4	5	55	3		56	3	
144	Wholesale rubber goods.....	1	1	1	7			8		
145	Wholesale salt and cement.....	2	2	1	62	1		13	1	
146	Wholesale spice and coffee.....	4	4	4	60	12		59	22	
147	Wholesale toys.....	1	1	1	10	2		7	1	
148	Windmill manufactories.....	2	3	4	28	1	1	56	1	
149	Wire goods and fence manufactories	4	1	1	19			7		
150	Woodenware manufactories.....	2			81	16				
151	Woolen mills.....	8	7	6	91	73		129	179	
Grand total and average.....		1,752	1,311	1,625	40,854	7,732	687	40,127	7,696	532

RECAPITULATION
MISCELLANEOUS

1	Iron, junk and rags.....			1						
2	Building material.....		1	1				8		
3	Clay pipe manufactory.....		1					4	1	
4	Real estate and loans.....		1	3				9	10	
5	Sewer bullders.....		1	1				162		
6	Wholesale glass.....			1						
7	Wholesale ice and cold storage.....		5	10				103	2	2
8	Wholesale saddlery.....		1	1				12		
9	Incubator manufactory.....		1	1				25	3	
10	Carpet and rug machine manufactory			1						
11	Steel and metal wheel manufactory..		1	1				135		
12	Dyeing and cleaning.....			1						



Cooper Wagon Co., Dubuque.
One of the largest manufacturers of wagons in the western country.

ENTIRE STATE—CONTINUED.

NO. EMPLOYED —1898.			Amount of wages paid—1898.	Amount of wages paid—1897.	Amount of wages paid—1898.	WEEKS IN OPERATION —1898.			WEEKS IN OPERATION —1897.			WEEKS IN OPERATION —1898.		
Males.	Females.	Apprentices.				Full force.	Short force.	Suspended.	Full force.	Short force.	Suspended.	Full force.	Short force.	Suspended.
11	44	0	18,410	1,800	10,702	40	11	1	53	1	47	5		
20	15	0	87,309	4,800	10,000	34	18	1	35	12	4	9		
6	1	0	5,000	1,500	3,000	52	0	0	45	0	0	17		
78	123	3	106,929	77,197	98,698	52	0	0	52	0	0	0		
17	9	0	4,046	2,740	3,988	30	0	0	22	30	0	0		
19	0	0	7,800	8,320	10,400	52	0	0	52	0	0	0		
5	1	0	2,400	1,900	2,280	48	4	0	45	12	0	0		
118	4	0	67,688	22,000	59,780	20	32	0	22	0	0	0		
90	44	0	78,447	64,125	60,315	41	11	0	46	6	45	0		
50	5	0	21,535	27,569	30,401	52	0	0	48	4	39	13		
34	0	0	2,895	9,873	8,300	30	32	0	38	13	1	12		
117	1	0	79,740	75,055	84,016	43	7	2	52	0	52	0		
310	8	0	116,995	68,837	101,462	38	13	1	45	8	39	11		
52	0	0	7,000	7,450	28,680	52	0	0	46	6	60	1		
305	30	0	128,274	90,738	123,147	50	0	2	48	4	49	3		
39	0	0	34,844	22,621	20,000	49	3	2	52	0	52	0		
80	0	0	30,780	35,528	46,299	52	0	0	52	0	52	0		
14	0	0	9,300	5,516	9,718	52	0	0	52	0	52	0		
61	6	0	47,344	45,060	59,114	52	0	0	52	0	52	0		
6	0	0	6,225	6,683	5,067	52	0	0	52	0	52	0		
8	2	0	23,265	8,000	4,900	52	0	0	52	0	52	0		
69	15	0	65,634	67,719	77,662	52	0	0	52	0	52	0		
8	2	0	6,125	5,000	5,000	52	0	0	52	0	52	0		
123	1	6	7,545	25,700	45,247	34	15	9	62	0	45	6		
8	0	0	5,964	1,275	1,370	26	3	7	45	0	26	26		
194	205	0	22,042	42,938	27,300	5	0	0	0	0	0	0		
194	205	0	42,938	80,689	112,563	52	3	34	52	6	11	34		
45,006	9,800	623	17,369,622	17,656,724	19,023,592	40	8	4	44	5	3	45		

BLANKS.

REPORTS.

10	0	0	0	0	5,000	0	0	0	0	0	0	0
10	0	0	5,400	1,500	7,500	0	0	0	0	0	0	0
28	16	1	7,144	1,000	23,123	0	0	0	0	0	0	0
10	0	0	17,000	0	5,350	0	0	0	16	0	0	26
35	0	0	0	0	15,000	0	0	0	0	0	0	0
247	2	0	28,700	5,375	54,423	0	0	0	34	15	3	31
15	0	0	0	0	7,300	0	0	0	0	0	0	0
30	5	0	10,863	0	12,500	0	0	0	0	0	0	0
5	1	0	0	0	4,438	0	0	0	0	0	0	0
26	2	0	59,256	11,128	111,128	0	0	0	50	2	0	4
2	0	0	0	0	2,175	0	0	0	0	0	0	0

RAILROAD STATISTICS.

The law regulating the bureau of labor requires that the information given in the biennial report shall be compiled by counties. In the case of railroad employes this could not be done, as the roads do not keep accounts by counties, therefore, the facts contained herein are from the railroad commissioners reports for 1897 and 1898:

EMPLOYEES AND SALARIES—1907.

RAILROADS.	GEN'L. OFFICERS.			OTHER OFFICERS.			GEN. OFF. CLERKS.			STATION AGENTS.			OTHER STATION MEN.			ENGINE MEN.		
	Number.	Tot. yearly compensation.	Av. daily compensation.	Number.	Tot. yearly compensation.	Av. daily compensation.	Number.	Tot. yearly compensation.	Av. daily compensation.	Number.	Tot. yearly compensation.	Av. daily compensation.	Number.	Tot. yearly compensation.	Av. daily compensation.	Number.	Tot. yearly compensation.	Av. daily compensation.
Ames and College.....	1															1	\$34.50	\$ 3.65
Albia and Centerville.....										2	1,200.00	\$ 1.92	3	443.33	\$.98			
Atchison, Topeka & S. P.....	5	7,200.00	\$ 4.00							2	2,317.80	\$ 2.17	13	6,450.00	\$ 1.49	52	95,968.84	\$ 7.71
Boone Valley.....																		
Burlington Oed. Rap. & N.....	4	\$ 19,300.00	\$15.41	20	40,345.05	6.44	106	\$ 50,322.60	\$ 1.80	161	97,652.40	1.93	161	67,813.20	1.35	107	126,100.00	\$ 3.80
Chicago, Burlington & Q.....	15	33,499.84	6.11				33	30,896.00	3.03	128	17,254.95	1.65	303	116,934.00	1.22	145	170,708.43	\$ 3.23
Chicago, Burl. & Kan. C.....										15	6,255.00	1.32	1	180.00	.88	11	12,070.20	\$ 3.40
Kan. City, St. Jo. & C. B.....										9	4,220.00	1.31	1	180.00	.88	2	1,969.20	\$ 1.19
St. Louis, Keok. & N. W.....										6	3,204.00	1.46	13	6,180.00	1.52	2	1,490.40	\$ 2.38
Humeston & Sheandoah.....																		
Chicago, Ft. M. & Des M.....	2	3,991.54	3.85	2	1,589.14	2.18	1	494.64	1.36	10	5,087.73	1.39	3	1,401.86	1.28	2	2,518.49	\$ 3.34
Chicago, Iowa & Dakota.....	2	1,895.00	2.65	1	3,700.00	7.40	1	300.00	.82	6	3,532.75	1.16				1	815.50	\$ 2.25
Chicago Great Western.....										70	48,934.43	1.73	63	47,538.00	1.37	72	93,423.40	\$ 3.53
Chicago, Mil. & St. Paul.....	8	63,561.66	18.80	13	50,569.22	10.25	84	53,716.24	1.74	233	125,005.81	1.72	238	129,788.76	1.61	129	237,220.33	\$ 3.74
Chicago, Rock Island & P.....										169	95,815.40	1.98	117	67,633.12	1.58	196	169,877.84	\$ 3.98
Chicago & North-Western.....	2	6,000.00	10.54				10	14,902.50	4.76	174	67,967.43	1.95	271	117,659.07	1.66	306	248,806.21	\$ 3.64
Chicago, St. P., Minn. & O.....										11	8,880.00	2.58	32	18,612.96	1.86	11	14,780.00	\$ 4.30
Sioux City & Pacific.....										13	9,724.84	2.39	39	22,969.61	1.88	14	19,571.25	\$ 4.55
Crooked Creek.....		3,638.00	3.97							1	270.00	.80				1	840.00	\$ 3.30
Des Moines, Northern & W.....	3	19,800.00	9.04	1	1,800.00	4.93	11	7,671.96	1.91	25	15,053.94	1.42	148	78,868.16	1.52	5	11,322.97	\$ 4.25
Dubuque & Sioux City.....	12	29,737.63	7.89				95	55,095.75	1.85	62	61,004.98	1.77	148	78,868.16	1.52	77	93,638.28	\$ 3.51
Des Moines Union.....		2,300.00	3.84					1,140.00	1.56				47	20,432.72	1.38	3	2,655.03	\$ 2.42
Iowa Central.....	16	43,692.82	7.98				59	37,504.20	3.05	70	81,700.00	1.65	35	13,358.00	1.41	48	46,254.56	\$ 3.83
Iowa Northern.....	1	900.00	1.96															
Keokuk & Western.....	7	11,869.32	5.43	5	5,719.00	3.13	11	5,095.96	1.36	14	2,210.57	1.41	13	5,306.61	1.41	8	7,275.00	\$ 3.22
Des Moines & Kansas City.....				3	2,905.61	3.89	8	3,337.64	1.28	18	4,941.00	1.90	6	1,821.53	1.22	13	6,511.69	\$ 2.40
Mason City & Ft. Dodge.....	4	6,043.26	4.14	3	3,450.00	3.15	14	9,730.11	2.22	14	2,357.21	1.50	12	5,313.25	1.44	1	3,738.50	\$ 4.47
Minneapolis & St. Louis.....	6	7,498.00	10.42	1	241.60	4.71	9	3,455.52	2.66	11	7,636.80	1.90	9	4,728.00	1.63	8	6,220.00	\$ 4.50
Omaha & St. Louis.....	6	6,650.00	5.30	6	5,382.50	4.31	13	7,555.25	2.15	13	7,500.00	1.65	20	7,637.25	1.57	7	6,262.05	\$ 3.85
Sioux City & Northern.....	5									1	480.00	1.53				1	614.64	\$ 2.05
Tabor & Northern.....																		
Union Pacific.....																		
Wabash.....	4	1,540.00	3.71	3	675.00	3.55	2	276.00	2.96	4	2,100.00	1.69	4	560.00	1.49	5	1,115.23	\$ 3.85
Winona & Western.....																		
NARROW GAUGE ROADS.																		
Burlington & North-western.....	2	1,472.50	6.73				8	3,544.56	1.90	8	3,286.20	1.31	2	629.64	1.01	2	1,769.25	\$ 2.83
Burlington & Western.....	2	2,070.50	4.61				8	3,563.69	2.68	15	5,215.15	1.11	2	972.36	1.55	3	4,157.50	\$ 4.43
Total.....	118	\$39,077.70		63	\$12,622.72		485	\$303,954.32		1,318	\$774,623.46		1,635	\$769,476.07		1,294	\$1,509,968.97	

*Mileage basis.

EMPLOYES AND SALARIES, 1897—CONTINUED.

RAILROADS.	FIREMEN.			CONDUCTORS.			OTHER TRAINMEN.			MACHINISTS.			CARPENTERS.			OTHER SHOMEN.		
	Number.	Tot. yearly compensation.	A.V. daily compensation.	Number.	Tot. yearly compensation.	A.V. daily compensation.	Number.	Tot. yearly compensation.	A.V. daily compensation.	Number.	Tot. yearly compensation.	A.V. daily compensation.	Number.	Tot. yearly compensation.	A.V. daily compensation.	Number.	Tot. yearly compensation.	A.V. daily compensation.
Ames & College				1	\$ 572.00	1.57												
Albia & Centerville				1	54,745.44	2.99	82	\$ 53,913.84	\$ 2.10	65	\$ 34,003.80	\$ 2.34	10	\$ 685.43	\$ 2.32	260	\$ 105,366.00	\$ 1.65
Aschton, T. & S. F.	55	36,311.52	\$ 2.22	14	7,630.00	2.10	167	43,216.32	1.88	142	78,949.23	2.30	145	76,908.00	2.04	839	357,104.30	1.50
Boone Valley	116	76,360.00	2.15	112	117,851.02	2.53	230	129,127.38	1.50	259	141,263.23	1.50	211	109,009.35	1.63	689	188,617.30	1.48
Burl. Cedar Rap. & N.	157	85,225.45	1.49	69	38,880.00	1.50	118	46,429.33	2.11	106	63,655.64	2.07	53	35,850.63	2.21	53	462,173.57	1.64
Chicago, Burl. & Quincy	103	89,678.00	1.41	678	326,420.31	3.55	168	106,814.65	1.71	97	63,038.56	1.78	67	32,284.73	1.51	60	78,997.72	1.80
Chicago, Burl. & O.	13	6,340.00	1.32	31	9,948.00	1.00	1	620.00	2.14	3	3,326.30	2.07	7	4,530.40	2.08	7	4,530.40	2.08
K. O. St. J. & O. R.'s	12	6,340.00	1.42	32	16,234.00	1.00	2	1,200.00	2.69	3	1,818.00	1.20	7	8,156.00	1.44	7	8,156.00	1.44
Chicago, R. I. & P.	9	4,860.00	1.33	33	5,094.00	1.21	5	3,770.20	1.24	5	1,140.00	1.55	7	6,895.20	2.70	7	6,895.20	2.70
Chicago & N. W.	230	532.91	1.58	2,202,818	231,632.20	3.23	452	239,392.73	1.91	164	88,240.78	1.79	164	102,690.89	2.28	610	274,954.33	1.48
St. L., K. & T. W.	2	7,747.00	1.19								5,262.00	1.68	2	616.80	1.97	17	9,675.00	1.82
Humeston & Shen.	2	814.20	1.50											1,941.60	1.66	17	8,818.80	1.66
Chicago, Ft. M. & D. M.	2	1,714.83	2.37	2	1,880.52	2.60	3	1,990.46	1.82	1	890.53	2.53	1	471.30	1.63	4	2,223.56	1.59
Chicago, Iowa & Dak.	1	450.19	1.24	1	661.00	1.81	2	1,012.48	1.39	1	730.00	1.97				9	369.00	1.39
Chicago Great West'n	72	5,729.20	2.16	54	56,919.31	2.80	132	71,777.10	1.48	31	33,878.10	2.39	86	50,718.70	1.81	145	110,400.12	2.42
Chicago, Mil. & St. P.	239	17,542.23	2.31	1,169	175,371.08	3.14	305	218,649.47	1.95	148	144,440.78	2.09	164	117,129.33	2.28	539	301,174.43	1.72
Chicago, R. I. & P.	130	105,528.68	2.69	94	108,144.48	3.66	161	120,267.12	2.36	95	34,788.90	1.73	100	66,881.88	2.14	274	142,577.04	1.66
Chicago & N. W.	330	532.91	1.58	2,202,818	231,632.20	3.23	452	239,392.73	1.91	164	88,240.78	1.79	164	102,690.89	2.28	610	274,954.33	1.48
C. St. P. M. & O.	11	8,979.99	2.61	10	11,051.75	3.02	29	16,083.94	1.98	42	30,443.63	2.01	30	18,625.22	1.98	7	7,770.96	3.55
St. Louis City & Pacific	14	14,250.51	3.01	9	9,746.50	3.46	12	12,640.93	1.89	45	45,959.50	2.77	71	30,027.31	1.76	805	98,854.30	1.44
Crooked Creek	1	480.00	1.53	1	500.00	1.88										1	453.32	1.44
Des Moines, N. & W.	7	7,095.48	2.67	7	7,784.78	3.18	12	6,846.78	1.77	41	43,192.38	2.48	8	5,076.38	2.03	3	1,981.61	1.46
Dubuque & Sioux C.	29	54,858.67	1.96	49	58,746.50	3.46	112	76,894.58	2.08	10	9,900.00	1.36	48	42,034.36	2.38	153	84,192.33	1.88
Des Moines Union	6	1,918.45	1.59	5	500.00	1.88								10,008.43	3.32	8	6,805.72	1.82
Iowa Central	48	28,120.32	1.87	29	39,310.68	3.22	68	30,538.38	1.87	41	14,633.55	2.21	74	25,098.63	1.93	140	62,746.12	1.75
Iowa Northern	1	540.00	1.54	49	609.00	1.65	2	2,000.00	1.36	21	9,768.25	3.05	20	7,897.25	1.77	73	29,444.45	1.56
Keokuk & Western	9	4,273.76	1.87	6	4,085.48	3.08	16	4,298.29	1.64	21	3,951.55	1.77	42	10,158.78	1.88	13	4,113.26	1.84
Des Moines & R. C. U.	17	4,112.39	1.38	7	4,990.33	2.08	8	3,673.77	1.32	1	2,661.55	1.77	42	10,158.78	1.88	13	4,113.26	1.84
Mason City & Ft. D.	3	2,428.23	2.26	3	2,993.28	2.00	2	2,188.44	1.77	3	2,791.61	2.52	16	2,480.74	2.42	17	8,449.30	2.08
Minneapolis & St. L.	14	10,248.00	2.18	11	11,940.00	3.23	22	13,020.00	1.38	3	1,950.00	2.80	6	4,541.20	2.42	17	8,552.72	1.82
Omaha & St. Louis	3	3,440.93	2.66	4	2,273.27	3.44	8	4,694.94	2.40	11	4,675.60	2.29	11	6,650.30	2.31	24	15,200.00	3.30
Sioux City & North'n	2	4,159.83	2.15	5	4,103.50	4.22	10	4,691.40	1.88	13	8,287.00	1.94	13	4,434.70	2.12	9	14,615.50	3.07
Tabor & Northern	1	453.56	1.44	1	317.75	1.01										2	882.15	1.00
Union Pacific	6	6,649.76	2.54	6	6,594.35	3.50	12	8,948.76	2.13	10	8,948.76	2.13	13	9,167.69	2.12	9	882.15	1.00
Wabash	3	887.47	1.56	4	707.16	3.80	8	696.94	2.24	2	287.70	3.85	13	917.69	2.28	7	882.15	1.00
Winona & Western	6	4,649.76	2.54	6	6,594.35	3.50	12	8,948.76	2.13	10	8,948.76	2.13	13	9,167.69	2.12	9	882.15	1.00
NARROW GAUGE R.'s	2	1,340.75	2.14	1	640.55	2.00	9	724.60	1.16	3	2,768.95	2.95	3	2,160.75	2.33	13	7,135.65	1.75
Burlington & W. P.	2	2,972.50	3.16	3	3,218.65	3.43	6	4,130.05	3.19	3	2,768.95	2.95	4	2,318.65	1.88			
Burlington & N. W.	2	2,972.50	3.16	3	3,218.65	3.43	6	4,130.05	3.19	3	2,768.95	2.95	4	2,318.65	1.88			
Total.	1,377	\$ 958,690.50		353	\$ 988,886.17		1,099	\$ 1,110,500.04		1,161	\$ 673,629.42		1,274	\$ 717,430.63		3,621	\$ 1,174,348.94	

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EMPLOYES AND SALARIES, 1897—CONTINUED.

RAILROADS	SECTION FOREMEN.			OTHER TRAINMEN.			SWITCHMEN, WATCHMEN AND FLAGMEN.			TELEGRAPH OPERATORS AND DISPATCHERS.			EMPLOYES ACCT. FLOATING EQUIPMENT.			ALL OTHER EMPLOYEES AND LABORERS.		
	Number.	Tot. yearly compensation.	A.V. daily compensation.	Number.	Tot. yearly compensation.	A.V. daily compensation.	Number.	Tot. yearly compensation.	A.V. daily compensation.	Number.	Tot. yearly compensation.	A.V. daily compensation.	Number.	Tot. yearly compensation.	A.V. daily compensation.	Number.	Tot. yearly compensation.	A.V. daily compensation.
Ames & College		\$ 443.20	\$ 1.21		\$ 8,889.95	\$ 1.14					\$ 400.00	\$ 1.28				1	\$ 240.00	\$.65
Albia & Centerville	4	2,040.00	1.53	16	14,017.78	1.21	11	\$ 8,865.36	\$ 2.72		\$ 2,040.00	1.89				79	\$ 35.55	2.10
Asch., Top. & Santa Fe	1	2,760.01	1.50	53												79	\$ 36,927.88	1.76
Boone Valley	1	540.00	1.54	3														
Burl. Cedar Rap. & N.	157	85,225.45	1.49	69	356,789.88	1.18	71	46,429.33	2.11	106	63,655.64	2.07	53	35,850.63	2.21	53	462,173.57	1.64
Chicago, Burl. & Quincy	103	89,678.00	1.41	678	326,420.31	3.55	168	106,814.65	1.71	97	63,038.56	1.78	67	32,284.73	1.51	60	78,997.72	1.80
Chicago, Burl. & O.	13	6,340.00	1.32	31	9,948.00	1.00	1	620.00	2.14	3	3,326.30	2.07	7	4,530.40	2.08	7	4,530.40	2.08
K. O. St. J. & O. R.'s	12	6,340.00	1.42	32	16,234.00	1.00	2	1,200.00	2.69	3	1,818.00	1.20	7	8,156.00	1.44	7	8,156.00	1.44
Chicago, R. I. & P.	9	4,860.00	1.33	33	5,094.00	1.21	5	3,770.20	1.24	5	1,140.00	1.55	7	6,895.20	2.70	7	6,895.20	2.70
Chicago & N. W.	230	532.91	1.58	2,202,818	231,632.20	3.23	452	239,392.73	1.91	164	88,240.78	1.79	164	102,690.89	2.28	610	274,954.33	1.48
St. L., K. & T. W.	2	7,747.00	1.19															
Humeston & Shen.	2	814.20	1.50															
Chicago, Ft. M. & D. M.	2	1,714.83	2.37	2	1,880.52	2.60	3	1,990.46	1.82	1	890.53	2.53	1	471.30	1.63	4	2,223.56	1.59
Chicago, Iowa & Dak.	1	450.19	1.24	1	661.00	1.81	2	1,012.48	1.39	1	730.00	1.97				9	369.00	1.39
Chicago Great West'n	72	5,729.20	2.16	54	56,919.31	2.80	132	71,777.10	1.48	31	33,878.10	2.39	86	50,718.70	1.81	145	110,400.12	2.42
Chicago, Mil. & St. P.	239	17,542.23	2.31	1,169	175,371.08	3.14	305	218,649.47	1.95	148	144,440.78	2.09	164	117,129.33	2.28	539	301,174.43	1.72
Chicago, R. I. & P.	130	105,528.68	2.69	94	108,144.48	3.66	161	120,267.12	2.36	95	34,788.90	1.73	100	66,881.88	2.14	274	142,577.04	1.66
Chicago & N. W.	330	532.91	1.58	2,202,818	231,632.20	3.23	452	239,392.73	1.91	164	88,240.78	1.79	164</					

EMPLOYES AND SALARIES—1928.

RAILROADS.	GENERAL OFFICERS.			OTHER OFFICERS.			GEN. OFFICE CLERKS.			STATION AGENTS.			OTHER STATIONMEN.			ENGINEERS.		
	Number.	Total yearly compensation.	Average daily compensation.	Number.	Total yearly compensation.	Average daily compensation.	Number.	Total yearly compensation.	Average daily compensation.	Number.	Total yearly compensation.	Average daily compensation.	Number.	Total yearly compensation.	Average daily compensation.	Number.	Total yearly compensation.	Average daily compensation.
Ames and College.....																1	\$ 485.20	\$1.33
Albia & Centerville.....																		
Atchison, Topeka & S. F.					9,270.00	\$1.88												
Boone Valley.....																		
Burlington, C. R. & N.	11	\$ 30,373.78	\$9.80	21	36,617.86	3.37	61	\$ 43,408.95	\$1.17	158	98,240.50	1.67	174	75,107.60	1.80	105	120,023.78	3.60
Chicago, Burlington & Q.	14	31,824.84	6.19				32	28,044.00	2.80	130	78,507.15	1.65	318	72,107.60	1.29	115	312,557.62	3.33
Chicago, B. & K. C.....																		
Kansas C., St. J. & C. B.					1,620.00	2.22	2											
St. Louis, K. & N. W.....																		
Chicago, Ft. M. & D. M.....	3	4,305.00	3.69					972.24	1.33	11	5,421.00	1.35	2					
Chicago, Iowa & Dakota	2	1,469.00	2.10					355.00	.63	6	2,584.71	1.18						
Chicago Great Western.....	1	3,000.00	3.22															
Chicago, M. & St. P.....	10	68,507.44	19.58	16	57,066.19	10.18	82	63,253.64	2.41	299	141,159.53	1.78	771	365,098.37	1.53	257	304,095.17	3.72
Chicago, R. I. & P.....																		
Chicago & North-West'n	2	6,600.00	10.54															
Chicago, St. P., M. & O.																		
Sioux City & Pacific.....																		
Crooked Creek.....	3	3,453.68	3.68															
Des Moines, N. & W.....	7	50,167.74	9.22	7	1,800.00	4.93	12	8,472.90	1.94	26	18,396.15	1.43						
Dubuque & Sioux City.....	8	40,269.46	8.73															
Stacyville railroad.....																		
Des Moines Union.....	2	2,550.00	3.95															
Iowa Central.....	17	35,393.20	7.95															
Iowa Northern.....	1	600.00	1.66															
Keokuk & Western.....	6	10,649.94	4.10															
Mason City & Ft. Dodge	4	5,980.00	4.10		6,632.00		15	9,354.00		26	15,692.00		26	11,976.37		15	16,399.64	
Minneapolis & St. Louis.	6	19,642.00	8.97	2	2,100.00	2.88	16	11,364.00	2.37	14	9,240.00	2.11	4	1,690.00	1.34	14	17,991.00	3.67
Omaha & St. Louis.....																		
Sioux City & North-e.n.	4	8,625.00	5.91	9	6,870.00	3.75	13	7,380.40	2.82	19	7,225.00	1.64	20	7,809.60	1.59	6	6,716.55	3.31
Tabor & Northern.....	6																	
Union Pacific.....																		
Wabash.....	1	3,992.50	14.58					5,841.20	2.67	9	5,208.63	1.80	21	10,557.79	1.65	10	12,494.49	3.89
Winona & Western.....	4	1,036.81	3.47	3	697.20	3.11	2	202.85	1.81	3	2,148.69	1.50	2	254.80	1.17	5	1,176.38	3.68
NARROW GAUGE ROADS.																		
Burlington & North'n.	3	1,907.00	4.67					2,002.43	1.83	8	3,251.70	1.30	3	764.65	.80	2	1,819.95	3.91
Burlington & Western..	3	2,497.40	5.32					2,660.77	2.37	14	5,185.80	1.18	2	965.00	1.54	4	4,467.00	3.57
Total.....	119	\$ 312,487.37		60	\$ 113,633.19		359	\$ 283,000.84		1,367	\$ 770,700.48		2,378	\$ 1,035,997.02		1,442	\$ 1,741,084.03	

BUREAU OF LABOR STATISTICS.

EMPLOYES AND SALARIES—1898—CONTINUED.

RAILROADS.	FIREFMEN.		CONDUCTORS.		OTHER TRAINMEN.		MACHINISTS.		CARPENTERS.		OTHER SHOPMEN.		
	Number.	Total yearly compensation.	Number.	Total yearly compensation.	Number.	Total yearly compensation.	Number.	Total yearly compensation.	Number.	Total yearly compensation.	Number.	Total yearly compensation.	
Ames & College.	1	\$ 509.50	1	\$ 150.50									
Albia & Centerville.	58	47,592.95	83	24,314.44	106	65,009.98	215	36,081.60	77	37,022.30	289	136,095.00	
A. C. Topeka & S. E.	10	76,617.05	2	300.00	14	62,230.61	115	71,020.00	160	85,473.61	318	130,924.81	
Boone Valley.	106	130,515.98	192	140,463.03	374	172,659.97	1,733	123,218.82	1,823	129,974.34	1,944	452,887.19	
Bur. Ced. Ran. & N.	196	7,262.20	215	7,804.00	321	9,837.40	1,883	1,228.88	1	875.00	215	10,028.80	
Chi. Bur. & Quincy.	11	598.20	1	1	1	1	1	1	1	1	1		
Chi. Bur. & Kan. Cy.	11	703.80	12	1,200.00	249	3,320.00	211	5,388.00	1,911	1,060.20	1,039	9,168.36	
K. C. St. J. & O. R.	1	898.20	1	1	1	1	1	1	1	1	1		
St. L. K. & N. W. St. P.	1	1,634.47	2	3,000.00	269	1,995.30	1,911	1,993.69	2,119	634.98	1,911	2,213.87	
Chi. & N. W. St. P.	1	453.86	1	1	1	1	1	1	1	1	1		
Chi. Ft. Mad. & D. M.	1	88,592.50	214	49,587.04	300	60,813.00	1,339	32,135.70	3,335	74,406.30	1,900	139,481.10	
Chicago, Iowa & Dak.	237	190,187.75	234	238,763.38	356	336,117.95	977	67,563.46	409	98,712.70	1,871	219,217.77	
Chicago & Western.	150	125,662.52	259	132,832.47	415	202,152,585.74	251	39,743.48	243	73,598.68	3,000	176,715.60	
Chi. & North-Western.	428	301,187.80	217	238,198.74	377	331,190.76	1,987	117,438.05	2,137	183,664.32	1,919	369,053.10	
Chi. St. P. M. & O.	11	9,272.88	372	12,155.43	314	27,16,890.33	200	37,772.70	1,977	32,048.00	1,907	7,779.96	
St. Louis City & Pacific.	16	13,349.02	2	1,429.88	611	13,015.02	159	62	40,674.76	310	42,997.43	1,311	101,856.98
Crooked Creek.	1	534.65	1	1	1	1	1	1	1	1	1		
Des. M. Nor. & West'n.	7	7,434.44	2	8,280.32	331	7,694.25	189	62	5,053.36	203	2,008.11		
Dubuque & Sioux Cy.	63	50,768.59	51	56,069.81	344	74,923.53	211	30	35,617.50	173	61	143,387.40	
Stacyville railroad.													
Des Moines Union.	3	1,611.69	1	1	1	1	1	1	1	1	1		
Iowa Central.	50	35,062.69	314	39,270.63	828	33,038.61	1,777	21	8,071.23	2,511	6	5,937.88	
Iowa Northern.	1	540.00	1	600.00	1	900.00	1	1	1	1	1		
Keokuk & Western.	16	9,732.84	1	10,456.31	1	9,952.99	1	18	11,553.90	41	13,831.16		
Mason City & Ft. D.	3	2,373.02	2	3,629.02	2	2,110.42	1,900	3	3,130.88	2	85	5,953.41	
Minneapolis & St. Louis.	14	10,008.00	218	11,228.00	322	15,120.00	1,948	2	1,953.00	81	8,530.00		
Omaha & St. Louis.	8	5,313.38	1	3,106.19	235	4,340.60	156	6	4,808.18	274	7,070.08		
Sioux City & North'n.	4	4,075.46	2	4,117.00	1	4,835.55	1	1	1	1	1		
Tabor & Northern.	1	439.56	1	317.75	1	1	1	1	1	1	1		
Union Pacific.	10	7,305.13	28	7,542.70	828	8,949.77	251	11	6,992.88	201	5,090.74		
Wabash.	6	2,642.01	4	7,722.38	7	787.04	156	2	871.47	130	13	15,875.80	
Winona & Western.	2	600.00	1	636.95	212	1	679.55	217	4	3,066.80	210	7,854.41	
NARROW GAUGE R.R'S.	2	1,383.00	2	31	1	4,488.41	203	3	1,998.85	213	5	2,136.40	
Bur. & Northwestern.	2	1,383.00	2	31	1	4,488.41	203	3	1,998.85	213	5	2,136.40	
Bur. & Western.	2	1,383.00	2	31	1	4,488.41	203	3	1,998.85	213	5	2,136.40	
Total.	1,514	\$1,083,507.45	1,045	\$1,133,625.58	3,981	\$1,305,441.56	950	\$37,227.34	1,355	\$10,954.67	4,190	\$2,085,616.44	

EMPLOYES AND SALARIES, 1898—CONTINUED.

RAILROADS.	SECTION FIREFMEN.		OTHER TRACKMEN.		SWITCHMEN, FLAG-MEN AND WATCHMEN.		TELEGRAPH OPERATORS AND DESPATCHERS.		EMPLOYEES ACC'T. FLOYD'S Q. M'T.		ALL OTHER EMPLOYEES AND LABORERS.			
	Number.	Total yearly compensation.	Number.	Total yearly compensation.	Number.	Total yearly compensation.	Number.	Total yearly compensation.	Number.	Total yearly compensation.	Number.	Total yearly compensation.		
Ames & College.	1	\$ 480.00	1	\$ 81.31										
Albia & Centerville.	4	2,040.00	1	1,639.00	16	3,484.80	81	4	420.00	184	1	240.00		
Atchinson, Topeka & S. E.	0	2,616.00	1.54	84	27,719.94	1.23	10	6,102.24	2.66	1	2,040.00	89	43,583.04	
Boone Valley.	166	90,885.00	1.50	663	150,466.25	1.23	28	47,199.24	2.30	62	43,095.23	170	71,541.00	
Chicago, Burlington & Q.	178	91,025.75	1.42	811	247,940.95	97	177	116,310.87	110	78,199.23	1,85	60,675.43		
Chicago, Bur. & K. C.	14	7,820.00	1.43	45	12,450.00	1.00	1	600.00	2.11	3	3,856.30	2.97	3,890.00	
Kansas City St. J. & O. R.	12	6,304.00	1.42	44	13,213.20	1.00	2	1,200.00	1.64	4	1,027.22	1.13	3,861.60	
St. Louis, Keokuk & N. W.	9	4,380.00	1.53	23	7,372.00	1.00	6	4,028.00	2.14	2	1,140.00	1.56	9,578.40	
Hamilton & Shenandoah.														
Chi. Ft. Madison & D. M.	9	5,070.00	1.54	28	10,654.05	1.26				1	600.00	1.84		
Chicago, Iowa & Dak.	3	1,540.00	1.23	10	3,186.22	1.08								
Chicago, Great Western.	71	38,010.00	1.49	345	149,175.00	1.22	51	41,146.80	2.11	53	35,514.00	1.83	187	109,081.21
Chicago, Milwaukee & St. P.	286	153,986.75	1.73	1,048	397,502.50	1.22	303	188,731.21	1,900	290	150,654.38	2.09	1,109	779,894.08
Chicago, Rock Island & P.	103	109,740.00	1.89	975	391,255.33	1.21	125	83,518.69	213	78	33,610.00	2.39	118	57,676.00
Chicago & North-Western.	224	123,632.47	1.76	698	378,636.91	1.39	917	154,838.43	2,28	188	116,327.97	1.93	500	294,715.97
Chicago, St. Paul, M. & O.	14	7,800.00	1.78	28	10,885.54	1.24	15	11,204.78	2.40	9	5,676.86	1.99	40	21,960.00
Sioux City & Pacific.	4	7,900.00	1.64	45	17,422.94	1.28	29	20,829.14	2.26	5	5,280.00	1.80	8	3,199.67
Crooked Creek.	2	933.00	1.62	4	1,088.40	1.25								
Des. Moines, Northern & W.	25	13,500.00	1.48	98	35,318.49	1.19				4	4,456.66	1.62	4	1,628.29
Dubuque & Sioux City.	89	51,694.96	1.54	491	98,624.78	1.11	60	35,358.00	1.84	8	4,456.66	1.62	104	76,549.41
Stacyville railroad.	1	280.00	1.64	5	423.88	1.11								
Des Moines Union.	3	1,850.00	1.69	16	7,579.15	1.20	29	13,885.87	1.70	1	950.00	1.64	20	7,123.25
Iowa Central.	69	33,291.28	1.54	710	67,628.45	1.09	39	19,256.80	1.96	28	13,663.00	1.68	63	17,088.30
Iowa Northern.	1	540.00	1.50	5	2,847.50	1.30								
Keokuk & Western.	33	15,320.42	1.45	165	67,544.45	1.11	11	5,297.12	1.15	15	5,623.20	1.44	15	8,663.30
Mason City & Ft. Dodge.	14	7,140.00	1.41	45	11,254.22	1.19	1	1,050.00	1.41					
Minneapolis & St. Louis.	37	14,850.00	1.73	63	22,379.50	1.10	4	3,000.00	2.28	13	6,120.00	1.44	13	8,820.00
Omaha & St. Louis.	13	5,344.16	1.42	38	12,063.46	1.00	1	1,873.11	1.62	7	3,873.00	1.63	7	3,873.00
Sioux City & Northern.	12	6,355.00	1.70	48	10,488.25	1.24	11	4,619.30	1.65	5	1,743.05	1.62	23	6,995.45
Tabor & Northern.	1	460.00	1.47	4	893.57	1.10								
Union Pacific.	5	4,582.03	1.78	33	12,027.29	1.16	15	7,787.18	2.05	6	9,916.02	2.02	16	12,181.95
Wabash.	4	3,029.35	1.61	8	3,645.99	1.27	1	190.20	1.93	1	151.50	2.03	2	622.86
Winona & Western.	7	3,887.60	1.81	15	5,994.85	1.19	1	315.26	1.09	1	869.72	2.10	14	8,293.25
NARROW GAUGE R.R'S.	15	5,996.00	1.60	26	7,074.57	1.19	2	1,886.14	2.21	1	894.93	2.40	6	2,143.90
Burlington & Northwestern.														
Burlington & Western.														
Total.	1,838	\$293,913.35	6,010	\$3,146,647.30	1,179	\$770,635.65	800	\$563,776.98	33	\$11,737.05	81	\$18,727.05	8,175	\$1,657,506.27

RAILROADS.	IOWA.						
	TOTAL INCLUDING GENERAL OFFICERS.			TOTAL EXCLUDING GENERAL OFFICERS.			DISTRIBUTION.
	Number.	Total yearly compensation.	Average daily compensation.	Number.	Total yearly compensation.	Average daily compensation.	
Ames & College	4	1,764.70	438.68	4	1,764.70	438.68	
Albia & Centerville	30	5,028.88	167.63	30	5,028.88	167.63	\$ 1.31
Atchison, Topeka & St. P.	854	530,580.00	621.29	854	530,580.00	621.29	\$ 15,447.36
Boone Valley	9	1,455,682.19	161,742.47	2,557	1,416,268.43	178.24	82,758.71
Burlington, C. E. & N.	3,982	2,316,917.28	581.83	3,982	2,185,298.44	548.84	90,668.84
Chicago, Burlington & Q.	135	72,909.60	536.36	135	72,909.60	536.36	
Chicago, H. & K. O.	190	42,550.32	224.00	190	42,550.32	224.00	
Kansas City, St. J. & C. B.	110	52,272.96	475.21	110	52,272.96	475.21	
Chicago, Ft. M. & D. M.	74	41,672.82	563.15	71	37,291.82	525.24	4,381.00
St. Louis, Keokuk & N.W.	30	12,576.59	419.22	32	11,516.39	360.19	1,060.20
Chicago, Iowa & Dakota.	1,582	1,028,063.05	649.81	1,581	1,025,063.05	649.81	3,000.00
Chicago Great Western.	5,986	3,743,292.21	625.37	5,976	3,674,604.71	614.96	68,687.50
Chicago, M. & St. P.*	3,025	1,704,656.22	563.42	3,025	1,704,656.22	563.42	5.00
Chicago, H. I. & P.	5,131	3,194,107.17	623.51	5,129	3,187,507.17	623.51	10,600.00
Chicago & North-Western.	304	197,957.59	651.16	304	197,957.59	651.16	2.08
Chicago, St. P., M. & O.	551	328,399.83	597.09	550	328,399.83	597.09	1.91
Sioux City & Pacific.	15	8,555.41	570.36	12	5,101.73	425.15	3,453.68
Crooked Creek.	232	141,990.10	611.57	225	121,822.30	541.43	20,167.80
Des Moines, N. & W.	1,708	985,959.34	577.22	1,700	920,948.94	542.32	65,010.40
Dubuque & Sioux City.	8	1,343.88	167.98	8	1,243.88	155.48	100.00
Stacyville railroad.	145	72,116.01	497.32	143	69,206.01	484.66	2,910.00
Des Moines Union.	1,575	591,859.87	376.14	1,554	516,617.11	332.50	75,242.76
Iowa Central.	12	6,547.50	545.62	11	5,947.50	503.96	600.00
Keokuk & Western.	579	244,389.82	422.09	573	233,749.88	409.52	8,639.94
Mason City & Ft. Dodge.	129	63,510.21	492.33	129	57,579.81	446.35	5,930.40
Minneapolis & St. Louis.	263	173,896.63	661.53	247	153,623.65	622.35	20,273.00
Omaha & St. Louis.	111	35,788.70	322.42	111	35,788.70	322.42	
Sioux City & Northern.	288	120,602.30	422.23	284	111,977.80	394.32	8,624.50
Tabor & Northern.	15	3,347.02	223.13	9	3,247.02	360.78	
Union Pacific.	196	120,010.75	612.30	198	120,010.75	612.30	9,741.30
Wabash.	79	15,555.47	197.03	75	14,518.06	193.58	1,037.41
Winona & Western.	89	44,650.81	501.81	88	42,743.21	485.81	1,907.60
Burlington & Northwestern.	99	50,778.45	512.96	99	45,281.05	457.37	5,497.40
Totals	30,009	17,390,215.01	562.83	29,800	16,908,727.64	564.05	\$648,487.37

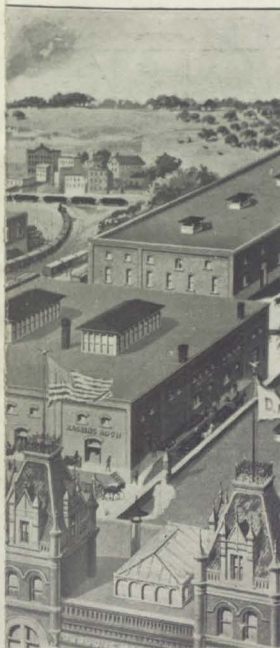
*Revenue train mileage basis.

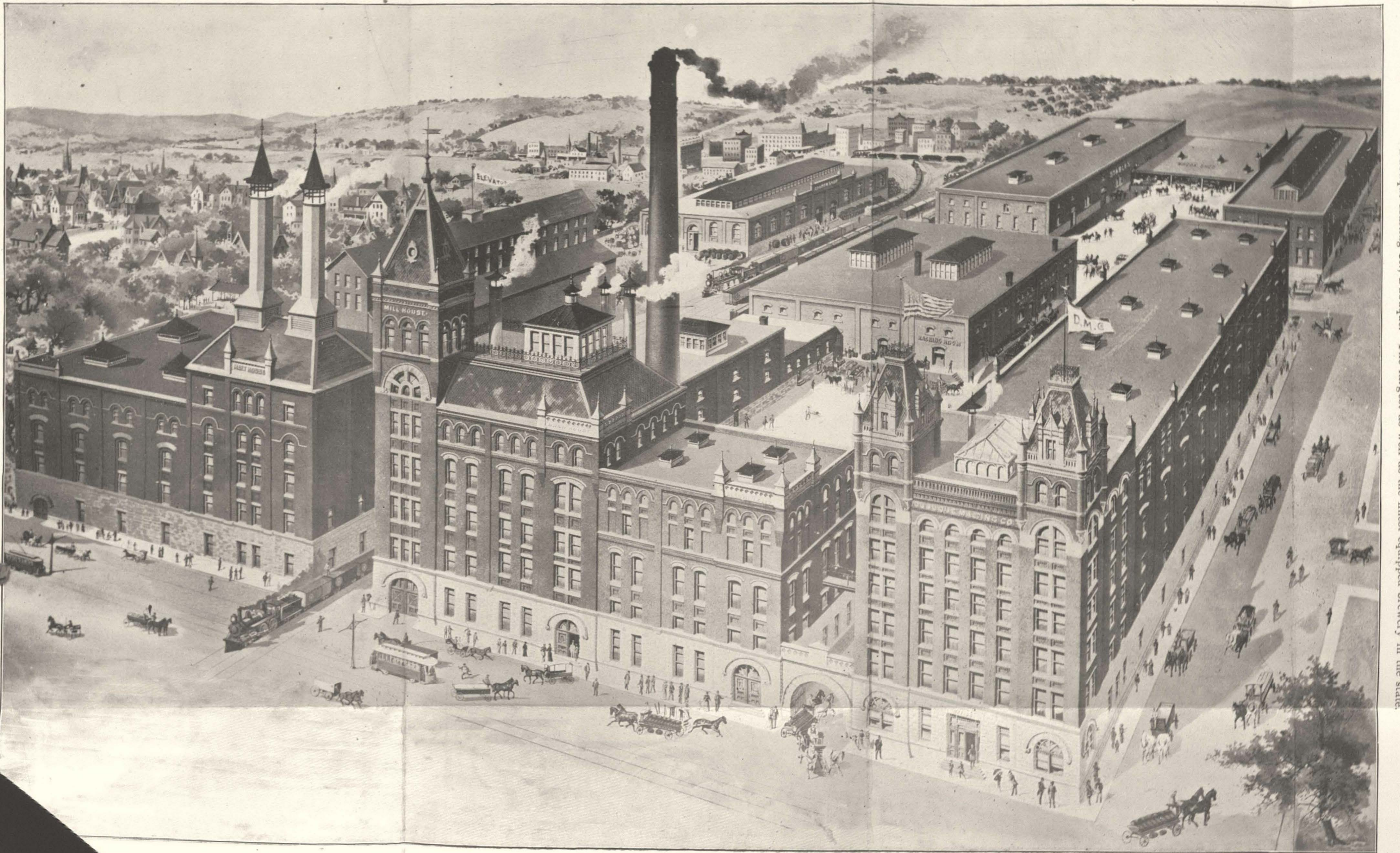
IOWA CONTINUED AND ENTIRE LINE.

IOWA.	ENTIRE LINE.								
	DISTRIBUTION.			TOTAL INCLUDING GENERAL OFFICERS.			TOTAL EXCLUDING GENERAL OFFICERS.		
	Maintenance structures.	Maintenance of equip-ment.	Conducting transportation.	Number.	Total yearly compensation.	Average daily compensation.	Number.	Total yearly compensation.	Average daily compensation.
5,858.90	2,190.96	2,190.96	30	5,008.86	167.63	30	5,008.86	167.63	
59,800.92	196,190.40	253,132.32	19,172	10,604,267.88	553.11	19,119	10,319,118.03	539.59	
467,805.77	257,237.00	667,507.71	3,337	1,501,082.16	450.13	3,336	1,501,082.16	450.13	
18,770.00	52,639.60	1,073,771.41	10,713	12,933,540.75	1,207.19	10,703	11,646,995.03	1,088.10	
20,089.30	10,029.80	12,582.56	324	151,032.79	466.15	323	151,032.79	466.15	
11,832.00	15,618.56	20,004.40	1,248	700,009.05	561.73	1,241	680,234.08	548.19	
16,359.03	3,697.56	14,778.99	74	41,672.82	563.15	71	37,291.82	525.24	
4,518.22	1,115.00	3,555.17	30	12,576.59	419.22	28	11,516.39	360.19	
244,945.99	518,880.13	3,335	2,920,754.09	822	3,254,210,558.00	1,78	3,254,210,558.00	1,78	
911,536.50	550,176.34	2,065,570.16	19,902	12,477,340.70	626.90	19,920	12,248,682.57	619.96	
404,743.04	373,558.70	1,018,656.42	11,470	6,271,575.07	547.08	11,455	6,372,576.31	556.93	
785,795.59	310,381.66	2,086,985.78	23,888	14,321,303.35	603	23,870	14,154,404.07	593	
122,691.99	172,918.46	615	337,783.53	188	599	4,434	3,857,323.88	868	
2,038.40	3,008.33	15	5,055.41	12	5,101.73	425.15	3,453.68		
58,138.14	85,891.92	322	141,690.10	187	325	131,822.30	1,85		
229,284.64	192,760.57	493,485.71	1,739	995,704.10	572.61	1,721	951,243.70	552.81	
722.3	521.50	8	1,243.88	118	1,243.88	118	1,243.88	118	
8,459.15	11,417.23	47,119.61	145	72,116.01	497.32	143	69,206.01	484.66	
136,696.49	115,055.91	234,789.57	1,916	79,352.94	648.22	1,896	68,192.85	359.73	
2,887.50	3,060.00	12	5,947.50	11	5,947.50	545.62	5,947.50	545.62	
91,055.45	48,107.30	85,193.16	732	311,112.49	424.89	746	300,432.76	402.72	
39,054.43	12,943.68	19,256.88	139	63,510.21	492.33	135	57,579.81	446.35	
54,299.50	9,370.15	76,591.00	1,190	701,651.70	590.42	1,134	709,271.70	625.19	
18,476.84	37,319.86	337	183,650.45	1,60	335	150,530.83	2,59		
22,932.30	28,177.60	47,617.50	308	128,725.00	418.23	304	120,110.00	398.36	
23,008.87	27,598.19	9,619.79	7,966	5,000,739.98	628.03	7,961	5,000,739.98	628.03	
5,977.56	2,262.52	6,075.75	153	14,656.91	172	149	9,969.27	66.8	
9,382.45	13,548.90	17,910.03	88	44,743.21	501.81	86	42,743.21	485.81	
15,694.57	4,135.25	26,850.47	99	50,778.45	512.96	96	45,281.05	457.37	
\$ 4,171,213.90	\$ 3,054,380.63	\$ 9,305,747.71	122,854	\$ 74,442,901.13	562.83	122,378	\$ 71,818,278.10	564.05	

STRIKES.

COUNTY.	1887.				1888.					
	No. of strikers.	No. persons involved.	Average days continued.	Loss of wages.	CAUSE OF STRIKE.	No. of strikers.	No. persons involved.	Average days continued.	Loss of wages.	CAUSE OF STRIKE.
Appanoose.....	4	116	25	\$ 7,150	Higher wages demanded and against	5	104	40	\$ 6,799	Could not agree on scale.
Marion.....	1	30	150	5,000	More wages.....	1	50	17	11,000	Higher wages asked.
Nabaska.....	1	269	6	2,000	Account of discharging part of force.					
Keokuk.....	1	32	9	600	..... from mine run to					
Wayne.....	3	118	8	2,300	For increase.	1	18	7	250	Increased their work without in-
Wasson.....	3	650	40	7,104	For increase.	1	40	30	1,500	Increasing pay.
Webster.....	1	100	1	100	For increase.	3	407	104	44,000	For increase.
Boone.....	1	100	1	100	Against reduction.	1	759	18	\$23,640	Against reduction.
Total.....	18	1,191	13	\$49,344		11	759	18	\$23,640	





Dubuque Malt & Brewing Co., Dubuque. The largest as well as the finest equipped brewery in the state.

PEARL BUTTON FACTORY.

The manufacture of pearl buttons from fresh-water mussel shells has grown to such magnitude in the past few years in Iowa that an attempt has been made by this bureau to furnish information regarding the same, that would give at least a fair idea of the amount of business done in this line. The United States fish commission, in its 1898 report, gives a very exhaustive resume of the business, and the following from the pen of Hugh M. Smith, of that department, is so concise and covers the ground so thoroughly that it is herewith given in full.

Although the business of manufacturing buttons from the shells of our native fresh-water mussels is of quite recent origin, it has already attained comparatively large proportions and seems destined to have still further growth. The fear is entertained, however, that, through indiscriminate methods, the supply of mussels may be so seriously reduced that the continuance of the fishery and the dependent manufacturing may be imperiled. The possibility of the early exhaustion of the mussel beds in that part of the Mississippi river which is in Iowa and Illinois has led a number of interested persons to request the United States fish commission to make an investigation of the subject, as this is the section in which the business is most extensive and has been longest established. In compliance with this request the writer was assigned to the investigation and visited the centers of the business in July, 1898. The present report is based on the observations then made.

The principal inquiries were conducted at Muscatine, Iowa, the leading center of the button industry, although some other important places, as Clinton and Davenport, were also visited. Many fishermen and manufacturers were consulted with regard to the important features of the business. The manufacturers, without exception, furnished detailed statistics concerning their work. Those whom it was not practicable to personally visit were corresponded with, and, with few exceptions, they have supplied the desired data.

The statistics herein presented relate to the calendar year 1897, and to the first six months of 1898, when there was a remarkable development of the button-making business. The figures are the first which have been collected covering this industry, and will prove useful in determining the changes which may take place in subsequent years.

The investigation naturally embraced the following general topics, which are hereafter specially considered: (1) The mussels utilized in button-making, (2) the mussel fishery, and (3) the button industry. To these

is added a chapter embodying a statement of the measures that appear to be demanded in order that the stability of the industry may be maintained.

THE MUSSELS UTILIZED IN BUTTON-MAKING.

While there are probably 400 species of mussels found in the Mississippi river and its tributaries, comparatively few are now utilized in, or are adapted to, button-making. The requirements of a shell, from the button-maker's standpoint, are sufficient thickness, a uniform color of the surface and various strata of the shell, and a degree of toughness that will withstand the necessary treatment without cracking or splitting.

Thin-shelled mussels are absolutely useless for button-making. Even if originally as thick as a button, the necessary grinding and polishing reduce them to mere wafers. The preferred color is white, but cream-colored shells are also employed. Shells with pink, purple, yellow or salmon-colored nacre are not suitable, as the color fades with age and is apt to be not uniform. Certain shells that satisfactorily combine thickness and color are nevertheless useless, because they are soft or brittle and break easily during manufacture. Dead shells that have been exposed for a long time to the action of air or water also become useless for button-making.

Mr. Charles T. Simpson, of the department of mollusks of the United States National museum, has courteously supplied the newly revised scientific names for the mussels used in the button industry, and has given valuable information concerning this family of mollusks, with which he is so familiar. For a very interesting and timely article on the fresh-water mussels, considered from the standpoint of the biologist, reference is made to Mr. Simpson's paper entitled "The pearly fresh-water mussels of the United States, their habits, enemies, and diseases, with suggestions for their protection," published in the bulletin of the United States fish commission for 1898.

Coincident with the establishment of the mussel fishery and button industry in Iowa and Illinois, there has arisen a new popular nomenclature for the mussels or "clams" utilized. The names applied by the fishermen and manufacturers have some reference to the color or shape of the shells. Originally quite local, they are now generally applied throughout the whole stretch of river in which fishing is done.

The principal species of mussel in the Mississippi river used in button-making is *Quadrula ebena*, generally known as the "niggerhead." This species has the general shape of a common round clam (*Venus mercenaria*), and is characterized by a very thick and heavy shell, with a black or dark-brown outside skin, and a glistening white interior, the latter color being uniform through the thickness of the shell. It is of relatively small size, the maximum being only four and one-half or five inches for the greatest outside diameter, and the average about three inches. Many less than two inches wide are also unnecessarily destroyed. It is often found over immense areas, preferring muddy sand and muddy gravel bottom, but also frequenting sandy bottom. In some places a form of this mussel known as the "mud niggerhead" is sparingly used. It is found on muddy bottom, and has a thicker shell and a more intensely black epidermis than the common form.

Several abundant species of mussels resembling the niggerhead in shape, but differing from it in having tubercles or excrescences on the outside of the valves, are locally known as "warty-backs" or "warty-back niggerheads" (*Quadrula pustulosa*; *Q. metamera*). They have very little value for buttons, the warts causing the shell to crack during cutting.

Another species of this class that is abundant, but only sparingly used, is the "bullhead" (*Pleurobema æsopus*). It is found with the "niggerhead," has a thick shell with a blackish-brown skin and a white interior, and externally presents several radiating ridges. It is of little value, as the shell is brittle and cracks in cutting, and the buttons also split in facing and drilling.

There are several kinds of mussels known along the Mississippi as "sand shells." The most abundant and important of these is the "yellow sand shell" or "yellowback" (*Lampsilla anodontoides*), which has a bright yellowish-brown epidermis, and a faintly cream colored interior. Another species with a black exterior is known as the "black sand shell" (*Lampsilla rectus*). The sand shells are found chiefly on sandy bottom, and are reported to be quite active, moving toward the shores in the morning and back toward the channel in the evening, making conspicuous tracks on the bottom. These mussels, which are long and narrow, reach a length of six inches, and are highly valued in button-making.

A smaller species is the "slough sand shell" (*Lampsilla fallaxiosus*), which seems to be most common in or near the mouths of narrow arms of the river, especially coves that extend into islands. It is less generally distributed in the river than the "yellow sand shell," occurs in much smaller beds, and is now quite scarce in most places where extensive fishing has been carried on. It is considered very good for buttons, having a beautiful pearly color and uniform thickness. It has been practically caught out in the vicinity of Muscatine, near which place a bed yielded ten tons a few years ago and ceased to exist.

Ranking next to the sand shells in abundance is the species known as "mucket," "mouket," or "mougrat" (*Lampsilla ligamentinus*). It attains a length of six inches, but the average size of those utilized is only about four inches. It has a dark brown exterior and a creamy-white nacre. Only second-class buttons are made from it, as the front part of the shell is thin and the back part brittle. New factory hands are usually set to work on this species.

One of the best mussels for buttons is known as the "deerhorn" or "buckhorn" (*Tritigonia verrucosa*). It is not abundant, and the supply is irregular and uncertain. It attains a large size; examples over nine inches long have been taken from the Iowa river, and in the Mississippi it reaches a length of six inches or over, the average being about five inches.

A rare but very desirable mussel is the species locally known as the "butterfly" (*Plagiola securis*), in allusion to the shape of the valves. The flat shell is of small size, but thick and of fine color. The epidermis is reddish-brown, marked by dark radiating lines. In 100 tons of miscellaneous shells from the Mississippi river, in the Muscatine section, there are likely to be only a few hundred pounds of "butterflies." In the Illinois, Ohio, and some other tributaries of the Mississippi, this mussel is abundant.

A mussel not very highly regarded by the button-maker, but sometimes used, is the so-called "blue-point" (*Quadrula undulata*). It has a large, thick shell, with a wavy exterior; the naere at one end is usually of a bluish or purplish color, in contrast with the white surface of the remaining part. The chief objection to its employment in button-making is the lack of uniformity in color.

Another species not highly regarded is the "hatchet-back," or "hackle-back" (*Symphyna complanata*). This is a large, black mussel, with a projecting wing. The valves are thin and of an undesirable color, and only a very small section of each is suitable for buttons.

Several species of "pocketbook" clams (*Lampsilis capax* and *L. ventricosa*) are more or less abundant, and yield a good button of medium thickness. They are characterized by having rounded valves of great depth.

Nearly all the tributaries of the Mississippi in this section contain mussels in some abundance, but no mussel fishing is done in them. The Iowa and Cedar rivers, for instance, have a good supply of large "muckets" and large "blue-points," which are the principal species; also pink and white "hatchet-backs," a few fine "sand shells," a very few "niggerheads" and "pocketbooks," and some extra large "deerhorns" of good quality; the last named constituting about 10 per cent of the mussels adapted for button-making. There is no fishing now carried on in these streams, although there was a little six years ago. It does not pay to ship the shells, and there is no local demand. In the Skunk and Des Moines rivers there are some shells that might be utilized, but they are not sufficiently abundant to maintain a large factory. Among others there are small, brittle "muckets" of little value, a few desirable "pocketbooks" and "sand shells," and some very good, medium-sized "deerhorns." In Rock river, Illinois, there is reported an enormous growth of "muckets," which are not utilized.

A number of animals prey on the mussels, among them the muskrat, the mink, and the raccoon; the first named being especially destructive. Catfish are also said to eat mussels. Hogs are known to be very injurious in some parts of the country.

Physical causes are undoubtedly responsible for extensive destruction of mussels. During freshets mud and sand are deposited on the beds and bury the mussels. Shifting sandbars are also known to cover up beds. The fishermen sometimes find extensive beds of dead shells which appear to have recently been uncovered by the current. During freshets, when the streams find new channels, many mussels are carried from their beds and left dry when the water subsides. Droughts, also, are liable to expose mussel beds and cause much destruction.

Pollution of the water by refuse from cities and manufacturing establishments is perhaps the most serious menace to the mussel beds, next to the operations of the fishermen. Certain kinds of refuse are very destructive, and are capable of killing practically every mussel with which they come in contact.

Fishermen and button-makers report a considerable percentage of "niggerheads" with the beaks partly gone, the remaining portion being softened and easily split into laminae. Accompanying this condition there is often a softening of the other parts of the shell in spots. Only the

larger (older) shells are thus affected, and it appears to represent a natural decay due to age. Buttons made from such a shell are soft, and are apt to split up into layers in the course of manufacture.

For much interesting information concerning the habits, spawning, mode of dispersal in the streams, rate of growth, etc., of the mussels, the paper of Mr. Simpson should be consulted.

THE MUSSEL FISHERY.

THE FISHERMEN.

The mussel fishermen in the region under consideration are mostly people who have been engaged in other branches of fishing, or who, as boatmen, etc., are familiar with the river. Many of them depend on mussel fishing for their livelihood and follow it throughout the year, but others seek mussels only when their regular work is suspended. Thus, in winter especially, the ranks of the regular mussel fishermen are considerably augmented by sawmill hands, farm hands, and others. Owing to the increase in the mussel fishery during the past two or three years, it is said that many farmers have had difficulty in obtaining men to work on their farms.

It is reported that in 1897 there were, between Burlington and Clinton, in Iowa, over 300 persons who engaged in taking mussels to sell to the button manufacturers at the various towns along that part of the Mississippi. In 1898 the number of fishermen between Ft. Madison and Sabula was estimated at 1,000. As many of the fishermen have no permanent headquarters, but move from place to place, it is difficult to obtain an accurate statement of their number.

The leading fishing and button manufacturing center is Muscatine, at which place, in 1898, there were about 100 mussel fishermen. On an extensive and productive bed as many as 150 to 300 fishermen may be engaged at one time.

In view of the small amount and inexpensive character of the apparatus required to prosecute the fishery, the comparative ease with which the mussels are taken, and the little experience required, mussel fishing is regarded with favor by many men, as they are readily able to get their catch to market and dispose of it, receiving cash in payment. When they find a good mussel bed they sometimes make \$30 or more per week. The average earnings, however, are considerably less; at this time probably being less than \$10 per week. Some days \$2 or \$3 will be made, but inclement weather prevents fishing and reduces the average.

The income of the mussel fishermen is now generally less than formerly, owing to the increase in the number of fishermen, the lower prices received for their catch, and the reduced abundance of the mussels.

APPARATUS AND METHODS.

Owing to the comparatively shoal water in which mussels are found, they may be gathered with less difficulty than is ordinarily encountered in taking shellfish. Furthermore, the shoalness of the Mississippi makes every part of it accessible to the fishermen, and renders the exhaustion of the beds more certain, speedy, and complete.

Mussels are obtained with various kinds of apparatus. Those which have been or are now in use are the hand rake, the tongs, the rake hauled by means of a windlass, the dredge operated by steam, and the bar with hooks.

The rakes are of several patterns, but all are essentially alike. The commonest form, known as the shoulder rake, has a wooden handle 14, 16, 18, or 20 feet long attached to one side of an elliptical metal frame; on the under side of the frame are 12 to 14 iron teeth, 5 inches long; the head of the rake is converted into a kind of basket, by a piece of coarse wire netting attached to the frame; the mouth of the basket is 8 inches deep, 6 inches wide, and 16 inches long. The rake is used from an anchored boat. The handle is placed over the fisherman's shoulder, and the rake is placed up-stream to the full length of the pole. The fisherman then slowly works the rake toward his boat, being aided in this by the action of the current on a broad wooden piece nailed crosswise near the base of the handle. The rake is then lifted perpendicularly from the water and the mussels are emptied into the boat. This rake is also used through the ice.

The tongs, which along parts of the Mississippi are called "scissor rakes," are similar to the ordinary oyster and clam tongs. They are used in water as deep as 15 feet, but usually in only 10 feet or less. The value of the tongs is \$3 or \$3.50 each.

The dredge or rake used with a windlass, locally known as the "drag rake," is larger and heavier than the shoulder rake, and of different shape. It has a rectangular iron framework, covered with narrow strips of hoop iron placed about an inch apart. The apparatus has the appearance of a flat cage, with long teeth projecting obliquely downward from the anterior lower margin. The rake, with the windlass and rope, is worth about \$25.

A large steam scow for taking mussels, owned at Muscatine, is unique. It is provided with a huge rake, or dredge, operated by steam. The rake is made of iron, and weighs 500 pounds. It is 48 inches long, 18 inches wide, and 30 inches deep, and is provided with 25 8-inch teeth. The rake is operated in a recess or slot in the bottom of one side of the scow. This recess is 5 feet wide and 40 feet long, and is surmounted by a framework with a double track, on which the heavy timbers supporting the rake slide while the rake is being dragged along the bottom. A perpendicular beam is attached to the rake, by means of which it is raised and lowered and dragged from the forward end of the recess. The length of this beam is such that the rake may be used in water as deep as 22 feet. This vessel carries a crew of four men, and cost several thousand dollars. It has not been sufficiently used to demonstrate whether it can be profitably employed with the mussels so much less abundant and more scattered than formerly.

In the spring of 1897 a very ingenious contrivance for taking mussels came into use and is now the leading means of capture. It consists of a circular rod, 6 feet long, of $\frac{3}{8}$ -inch iron, to which are attached, at intervals of about 6 inches, series of four-pronged hooks, made of stout (No. 9) wire. These hooks are made of two pieces of wire, so fastened together that the prongs will be at right angles to each other. The hooks are 4 inches long, and are fastened to the iron bar in strings containing two or three hooks, which are attached to each other and to the bar by twine, pliable wire, or chains, so they will be freely movable. A strong piece of rope is tied at or

near each end of the bar, forming a bridle, to which is fastened the bail, or the rope by which the dredge is pulled. This rope is about 25 feet long. The quantity of hooks varies with the length of the bar and the number in each string. A 6-foot bar, with 3 hooks on each string, the strings being 6 inches apart, would have 39 hooks. A 7 $\frac{1}{2}$ -foot bar, with only 2 hooks on a string, and the strings 4 or 5 inches apart, would contain 46 hooks.

In allusion to the shape of the hooks, this apparatus is locally known as the "crowfoot" dredge or rake.

The usual outfit for a fisherman is two dredges, valued at \$1.50 to \$2 a pair.

A modification of this appliance consists in putting wooden wheels, six inches in diameter, on the end of the iron bar, so that the bar will clear the bottom as the dredge is hauled, and will not disturb the beds.

This apparatus depends for its action on the habits of the mussels.

They rest on the bottom, or partly buried in the mud or sand, with the free margin of their shells turned upstream and with their shells separated to admit the water, laden with oxygen and food. When touched they quickly close their shells, and if a foreign body is interposed between the valves it is tightly grasped and retained.

The method of using this appliance is as follows: The fisherman throws it overboard from his boat and allows the boat to slowly drift downstream. As the numerous prongs come in contact with the open shells, the latter quickly close on the hooks and retain a tight hold. After drifting for a short distance, say fifty feet, the dredge is drawn in and the mussels removed from the prongs, considerable force often being required to detach them. In order to facilitate the handling of the dredge, the fishermen place two upright forks on each side of the boat, on which the dredge-bar rests, the hooks swinging freely. The shorter bars are supported across the ends of the boat, while the larger ones rest on side uprights. While the mussels are being taken from one dredge, the other is being dragged and is ready to be hauled in by the time the first is stripped.

Anyone who has not witnessed the use of this apparatus can scarcely realize how remarkably effective it is. Often when the mussels are abundant almost every prong will have a mussel on it, and two or three are sometimes caught on one prong. The writer saw 60 marketable mussels taken on 39 hooks, and has often observed large clusters of shells on a single string of hooks. When the beds of mussels are compact one man can take 800 to 1,000 pounds of "niggerheads" in a day, and a case is reported where 2,200 pounds were obtained by one man in ten hours. The average daily catch at present, however, is probably not over 500 pounds.

On account of the cheapness and efficiency of this apparatus, together with the ease of operating it, it has become very popular with the fishermen and has practically superseded all other appliances. It is said to reduce the labor of fishing about half, as compared with the shoulder rake and dredge. Another advantage is that it takes only live shells, while the other appliances are often loaded with dead shells, trash, etc. By its use a larger area can be covered and fishing done on grounds that could not be profitably worked by any other means, owing to the shells being much scattered.

After sufficient ice forms on the river there is considerable mussel fishing through the ice with "shoulder rakes" and "scissor rakes." For the use of these appliances under such circumstances a hole 2 to 6 feet square is cut through the ice.

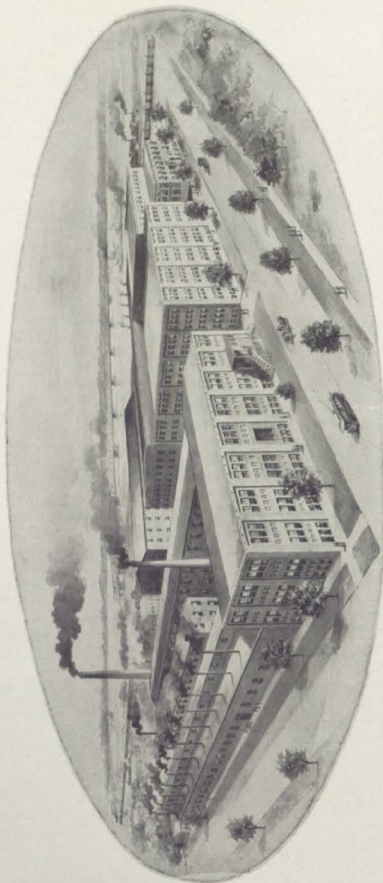
Ice fishing presents an interesting scene when large numbers of fishermen are working at one time on the same ground and engaged in the various steps of the business—some sawing holes through the thick ice, some drawing their rakes, some sorting their catch, some taking their catch to shore, and some returning to the grounds with their empty vessels.

Among the illustrations herewith presented are two showing men engaged in ice fishing near Le Claire, Iowa, in the winter of 1898-9. The bed on which the fishing is being done is nearly a mile long and about 100 yards wide. It has been worked for several years, in both winter and summer, and has yielded large quantities of "niggerhead" mussels. On one occasion, in the winter of 1898-9, 142 men were digging mussels at one time on that part of the river shown in the views, and up to the latter part of February they had obtained over 500 tons of shells from this section. When the photographs were taken, shortly after a period of excessively cold weather, when fishing was suspended, only a few of the fishermen had returned to work. The ice is 12 to 28 inches thick and the water over the bed is 8 to 14 feet deep. One man is seen sawing a hole through the thickest ice. Some men work alone, others in pairs. When two operate together, one uses the rake while the other sorts the mussels, frequent change of duty being made, as the hauling of the rake is quite arduous. One of the long-handled rakes with fine, long tines, is shown. One man can dig or rake from 600 to 800 pounds of shells daily on such a bed. They are sorted in pails, emptied into box sleds, and hauled over the ice to the place where they are weighed and paid for.

The fishermen who use the shoulder rake or "crowfoot" have small flat-bottomed skiffs, worth from \$5 to \$10 each. Those employing dredges have a barge or flatboat with deck-room sufficient for the manipulation of the windlass and dredge, and also a temporary cabin. Such a boat is valued at \$20 or more.

Some fishermen have large houseboats, which are moored at places convenient to the fishing grounds and serve as temporary homes. The value of such boats is about \$200. Usually a fisherman and his family will occupy one boat, and live very comfortably during the fishing season.

The fishermen have crude, oblong tanks, located at some convenient place on the shore, made of sheet iron, capable of holding water. A fire is built under the tanks, and the mussels are boiled 10 or 15 minutes in order to kill them and permit the extraction of the fleshy part. Under the influence of the heat the shells open, and the meats either fall out or are readily picked out by hand. After being thus prepared, the shells are loaded in sacks and sent by steamer to the button factory, or they may be taken to market in the fisherman's boat. Sometimes large scows are loaded with shells at a camp and towed to the factory town by a tug. Shells are also sold on the shore to buyers representing the local button-makers, or factories in other states.



The Morrison Manufacturing Co., Manufacturers of Farm Tools, Ft. Madison. Located on the original site of the old fort, a cut of which will be found on a following page.

A view is presented showing a part of a "boiling-out" shed, at Le Claire, Iowa, where many of the fishermen disposed of their catch in the winter of 1898-9. The shed, which is 40 feet square, has three furnaces, on which are huge boiling pans, each holding 20 bushels of mussels. The mussels are boiled for about 15 minutes and then thrown out on tables, when the meat easily comes from the shells as they are broken or pulled apart and thrown into a heap. When photographed, this shed contained 200 tons of cleaned shells, while outside were 350 tons in heaps.

The fishermen make no use of the "meats" removed from the shells in cooking. In some places the meats are eagerly sought by farmers who go to the fishing shores, collect this waste product without cost, and feed it to hogs and poultry. It seems probable that the fishermen might add materially to the proceeds of their fishing by finding a market for this waste. The quantity is, in the aggregate, large, amounting in the first half of 1898 to fully 500 tons. From a ton of niggerhead mussels as taken from the water over 300 pounds of meats may be obtained. The food value of the mussels is practically nil, and only limited quantities are used for bait in line fishing. It is possible, however, that a market for the meats, in a salted condition, may be found in the Atlantic coast states, where salt clams are extensively employed in the line fisheries for cod, haddock, hake, and other ocean fishes. Recently, considerable quantities of fresh-water mussels, taken from ponds in southern Massachusetts, have been salted and sold to cod fishermen at a good price (\$4 or \$5 per barrel of 200 pounds). Even at \$3 per barrel, the Mississippi river fishermen could well afford to send their waste mussel meats by freight to the coast. It is not known just what effect cooking has on the quality of the meats, but it is thought that this process does not seriously impair their value as bait.

THE FISHING SEASON.

In the early days of the industry fishing was carried on from about August to December, but of late it has been conducted throughout the year, even after the river is frozen. The principal fishing, however, is still done in late summer and fall, when the river is lowest. On one bed, near Muscatine, 50 persons were at times engaged in ice fishing in the winter of 1897-8, and on other large beds as many as 200 persons have been employed at one time. Ice fishing is of comparatively recent origin, having been first carried on only during the winter of 1896-7. The quality of the shells is better in cold weather for the purpose of the button-maker. The mussels are then less brittle, while warm weather, with prolonged exposure in boats, makes them brittle.

The question of a close season for the mussel fishery, in order to afford the mussels a respite from incessant hunting, especially during their spawning time, is now being agitated, and is hereinafter discussed.

THE FISHING GROUNDS.

The Iowa and Illinois button factories located on the Mississippi river obtain their supply of shells from grounds which extend from Ft. Madison, Iowa, to Sabula, Iowa. This section of the river is 167 miles in length, following its sinuosities, although the distance in an air line between the points named is only 118 miles. The average breadth of the river is two-

fifths of a mile; the maximum unobstructed width being about one mile, just north of Campbell Island, between Le Claire and Davenport.

This part of the Mississippi is quite shallow at the mean stage of the water. The usual depth in the channel is 12 to 14 feet; the deepest water being only 33 feet. On either side of the channel the bottom generally slopes gradually to the shores. In the latter part of summer and the early fall the depth is always reduced by the diminution in the volume of water coming downstream, while in winter, spring, and early summer the river is swollen by rains and melting snows; there being every season a freshet of greater or less severity.

The character of the bottom varies greatly, but it is usually sandy; sandbars and low, sandy islands being common features. There are, however, more or less extensive areas of muddy bottom, and in some places rocky or gravelly bottom prevails.

Owing to the shoalness of the river, and the character of its bed, the annual freshets produce marked changes in the bottom topography. These changes have an important relation to the mussel beds, which are sometimes entirely swept away, and sometimes completely destroyed by being covered with sand or mud; such beds of dead shells are not infrequently found by the fishermen when subsequent freshets have swept off the overlying sand or mud.

Throughout the river section mentioned mussels are found in scattered or in condensed bodies. The natural tendency of some of the species is to form more or less dense beds, while others seem to be uniformly distributed. Considered as a whole, this part of the Mississippi river is undoubtedly one of the most favored sections of the United States as regards abundance and variety of mussels adapted for buttons. By far the greater portion is taken from special areas on which they are more abundant and more closely grouped than in other places. Such beds, which are sometimes of great extent, have their principal axis lengthwise the river, and are often quite narrow.

On some grounds practically all of the mussels are of one species, while on others several species may be mixed in varying quantities. The largest and most compact beds are formed of "niggerheads" and "muckets." On new grounds the "niggerheads" are sometimes so thickly disposed that practically the entire bottom over a large area is covered, and the shells are often found several layers deep. In holes or depressions in the sandy or muddy bottom "niggerheads" are often discovered in thick piles, and many bushels may be taken from one of these holes.

Owing to the crowding of the mussels some of the fishermen think that fishing is beneficial to the beds, in that it spreads the mussels over a larger area, and permits a more rapid growth and increase of those that remain. There is a popular belief among some of the fishermen that depleted beds may be re-established in three years—that is, the mussels are thought to reach a marketable size in three years after the young are hatched. Most of the fishermen and manufacturers, however, have no definite knowledge as to the rate of growth, although all think it more rapid than is actually the case.

Among the noteworthy mussel beds that have been worked in the past few years are the following:

In 1896 a bed of "niggerheads" and "muckets" in front of Muscatine, about 2 miles long and $\frac{1}{2}$ mile wide, yielded 500 tons of shells.

A very large bed was discovered near New Boston, Ill., a few years ago. It was about $\frac{1}{2}$ miles long and 60 rods wide, with the shells very thickly disposed. It is reported that fully 10,000 tons of shells, chiefly "niggerheads" and "muckets," with a few "sand shells," were taken during the past three years. The number of mussels represented by this enormous quantity was probably not less than 100,000,000.

There is a very large and productive bed 3 or 4 miles below Clinton, on the Illinois side of the river; it is a mile long and several hundred feet wide. The shells, in places, are reported to be several feet deep, but the greater part of those lying deepest are dead.

One of the most noted beds in the upper river is near Camanche.

In 1898 the principal mussel fishing was done between Davenport and Clinton. While other parts of the river were also resorted to by the fishermen, the bulk of the catch was from beds in the upper river that had not been so actively worked as those in the vicinity of Muscatine and other places as far down as Burlington.

In July, 1898, when the writer visited the river, a number of camps of "clam" fishermen were met with between Davenport and Clinton. One of these, located directly on the bank of the river, was quite extensive and presented an interesting scene as the numerous boats brought in the shells from the adjacent river, and as the catch was being cooked and piled up at the headquarters of each crew. The principal apparatus in use along this section was the grapple, although a few shoulder rakes and drag rakes were also seen.

The shells for the Davenport factories come chiefly from the vicinity of Princeton, where there is a great abundance of mussels. In May, 1898, the fishermen were restricted in bringing in their catch, as the factories could not handle all of it. Although there are a good many "muckets" in the river in the vicinity of Davenport, there was in 1898 no demand for them.

Reference has already been made to the productive bed near Le Claire, Iowa.

DEPLETION OF THE GROUNDS AND ITS CAUSES.

Although the mussel fishery along this section of the Mississippi river is under ten years old and in most places began within the past two or three years, it has already had a pronounced influence on the productivity of the mussel beds and bids fair to lead to serious consequences to the capital invested in the button industry of the states of Iowa and Illinois. Throughout this stretch of river, wherever fishing has been at all regular or active, there has been a more or less marked reduction in the abundance of mussels of all kinds utilized in making buttons, and in some localities the depletion of the grounds has been almost complete.

The manufacturers generally recognize the present tendency toward the practical exhaustion of the available grounds, and feel the need of some action that will place the industry on a permanent basis. The fishermen also, however loath they may be to acknowledge it, have practical evidence that the mussel grounds are capable of depletion and are being greatly reduced in productiveness. The many persons financially interested in

the mussel fishery and the button industry are very desirable that appropriate measures be taken to insure the existence of a substantial business of this kind. Suspension of the industry along this part of the river—which is not a remote contingency—would prove a calamity to many of the communities.

The present condition of the principal grounds, before referred to, illustrates the serious effects of indiscriminate fishing, and emphasizes the solicitude felt by the button-makers and others for the maintenance of the supply. Thus, the large bed in front of Muscatine was unable to stand the drain of one year's fishing, and now yields few mussels. The New Boston bed, reported to be the best in this section of the Mississippi, was so assiduously worked that it was completely exhausted, few fishermen resorting to it in 1898. The abundance of mussels was incredible, and yet a few seasons' operations depleted this ground. It is reported that when fishing first began on this bed some men took as much as 1,500 to 2,000 pounds of shells in a day's fishing, but now a fisherman would have difficulty in getting that quantity in a week.

Between Burlington and Davenport the condition of the beds is such that many fishermen no longer resort to them, but go to grounds that have been worked for a shorter time. Up to July, 1898, there had been no noteworthy decrease in the mussels in the river near Davenport, but the fishery there is still quite young, and the manufacturers are anticipating a decrease.

Owing to the very slow growth* of the mussels and the comparative facility with which the fishermen exhaust new grounds, there is no reason to believe that depleted beds will recuperate while the grounds on which fishing is now being done continue to be productive, so the indications are that the conditions will steadily grow more unsatisfactory.

The history of the fishery up to this time shows the disregard for the future which has come to be regarded as characteristic of fishermen. The decrease in the mussel supply has been brought about by several practices. The principal factor has been the activity of fishing operations. Not only have large quantities of mussels been taken from the bed at one time, but the fishing has been so incessant that no opportunity has been afforded the beds to recuperate. The shoalness of the water has made it possible to thoroughly scour almost every foot of ground. The high water that prevails during a part of the year was formerly a protection to mussels at an important time, but it is no longer, as the present apparatus may be used at all times when a boat can be managed.

The failure of the fishermen to suspend their operations immediately prior to and during the spawning season of the principal species of mussels has undoubtedly had a serious effect on the supply. This question has been freely agitated in the local press, and the sentiment among most of those interested, including fishermen, favors protection for the mussels at this critical time. Under the impression that the spawning occurs in spring, they advocate a close time at that season.

* For example, the time required for a "niggerhead" mussel, under normal conditions, to reach a size of 3 inches is not less than 10 years and is perhaps generally as much as 12 years, while a shell 4½ inches in diameter is from 15 to 18 years old.

A good many fishermen and manufacturers expressed the view that ice fishing is unduly destructive, owing to the fact that enormous quantities of mussels—some as small as 1 inch in diameter—are brought up and left on the ice to freeze and die. These, in open water, would drop back or be thrown back as the catch is removed from the rakes or tongs, or when the boats are cleaned. Aside from this damage, many think the shells should be unmolested during the winter, when they are more or less dormant. Many persons expressed themselves as favoring the prohibition of ice fishing.

The suspension of the ice fishing and spring fishing would, of course, keep many fishermen out of employment at a time when they need ready money. There is little reason to believe, however, that it would reduce their annual earnings, even at the outset, while ultimately it would undoubtedly prove financially beneficial. The manufacturers report that no injury would result to the button business from their failure to receive shells during a closed season, as they could—as most of them now do—lay in sufficient supply in summer and fall to keep the factories running.

Not the least injurious feature of the fishery is the gathering of small mussels for market and the incidental destruction of small shells that are not utilized, but left on the banks or the ice to die. The testimony of the button manufacturers and the evidence afforded by their shell heaps indicate that there are comparatively large quantities of immature mussels taken. This practice depends to some extent on the depletion of the grounds of the larger mussels, necessitating the gathering of the smaller ones to make a fair catch, but also on the indifference of the fishermen to the great injury thus done the mussel supply. The manufacturers are, of course, equally indiscreet in continuing to purchase lots of small shells, and a few of them refuse to do so, but it is generally not feasible to exclude the small shells mixed with the larger ones. The desire that there should be some restriction on the size of the shells taken is quite general among the manufacturers. However, as long as the fishermen bring them in the manufacturers will buy them. Some of the button-makers, indeed, prefer comparatively small shells—say niggerheads 2¼ or 2½ inches in diameter—for the reason that their quality is as good as or better than many of the large shells, and the waste is relatively less.

If no mussels smaller than 2½, 2¼, or even 2 inches in diameter were gathered, the matter would not be so serious, although it must be acknowledged that shells less than 2½ inches in diameter are very small, but many mussels only an inch in diameter have been sacrificed, and some of the manufacturers report that considerable numbers of shells no larger than a nickel or a dime are brought in. From a niggerhead shell an inch or less in diameter only one medium-sized blank may be sawed. Thus, for two buttons, a mussel is sacrificed which, in a few years, would have yielded eight to twelve times as many.

PRICES RECEIVED FOR SHELLS.

The prices which the fishermen receive for shells vary considerably, depending on the supply and demand. The size and kind of the shells also affect the price. The standard shell is the niggerhead. In 1897 the market value of this species in Muscatine ranged from 40 to 63 cents per 100 pounds. Shells were cheaper in 1898 than at any previous time, but in

February, 1898, there was a scarcity of shells at the factories, prices went up to \$18 and \$20 per ton, and many fishermen were thus induced to enter the business for the first time, and the supply was soon in excess of the demand. By July, 1898, the prices had fallen as low as 30 cents per 100 pounds for small "niggerhead" shells and 35 cents for large ones.

The ruling prices for other shells in 1897 were as follows, per 100 pounds: Sand shells, \$1.70; muckets, 30 cents; deerhorns, \$2; pocketbooks, 50 cents. The other species—bluepoints, butterflies, bullheads, hatchet-backs, etc.—are seldom sold separately, but are mixed with some of the shells named. Slough and sand shells bring \$1.50 to \$2 per 100 pounds, but few have been obtained in recent years.

When fishermen dispose of their catch without removing the meats, the prices usually range a fourth lower than for cleaned shells; thus, when "niggerheads," as usually sold, are bringing 40 cents per 100 pounds, those disposed of as they come from the water are worth only 30 cents.

It has been determined by actual count that in 100 pounds of the average size "sand shells" there are about 900 to 912 valves or half-shells. In 100 pounds of "niggerheads" of the average size now taken there are 970 to 1,000 valves. These numbers seem high when the thick and heavy shell of this species is considered, but they have been amply verified, and indicate the inordinate use of small mussels to which reference has been made. In 100 pounds of "muckets" there are 800 valves. Thus, in a ton of "niggerheads" there are 9,700 to 10,000 complete mussels represented, in a ton of "muckets" 8,000 mussels, and in a ton of "sand shells" from 9,000 to 9,120 mussels.

SHIPMENT OF MUSSELS TO OTHER STATES.

In 1897 a rather important business sprung up at Muscatine, consisting in the purchase of large quantities of shells from the local fishermen and their shipment by train to button manufacturers both east and west of the Mississippi. The business is restricted to "niggerheads" and "yellow-backs." In 1897 the fishermen received on an average 40 cents per 100 pounds for the "niggerheads" and \$1.50 per 100 pounds for the "yellow-backs." In 1898, up to July 1st, the prices were 35 cents and \$1, respectively. The shells are mostly shipped in carload lots, although a few are sent in smaller quantities packed in sacks. The amount of the shipments in the first six months of 1898, namely, about 14 carloads, was almost as large as during the entire season of 1897, when the equivalent of 14½ carloads was shipped, but the cost value of the shells was much less in 1898.

Shipments of shells are also made from other places on the Mississippi, and the business seems to be growing. In the winter of 1898-99 one buyer at LeClaire, Iowa, had a contract for 1,000 tons of shells to be shipped to New York.

Other states to which mussel shells have been sent from this part of the Mississippi are Michigan, Pennsylvania, Nebraska, New Jersey, in addition to a number of places in Iowa and Illinois not on the river.

The extent of the business at Muscatine in 1897 and 1898 to July 1st is shown in the following table:

YEAR.	KINDS OF SHELLS.	SHIPPED EAST		SHIPP'D WEST		TOTAL.	
		Pounds.	Cost.	Pounds	Cost.	Pounds.	Cost
1897	Niggerheads	163,000	\$ 640	100,000	\$400	260,000	\$1,040
	Sand shells	170,000	2,550	.....	.....	170,000	2,550
	Total	330,000	\$3,190	100,000	\$400	430,000	\$3,900
1898 (to July 1)....	Niggerheads	300,000	1,050	60,000	210	360,000	1,260
	Sand shells	60,000	600	.....	.....	60,000	600
	Total	360,000	\$1,650	60,000	\$210	420,000	\$1,860

RECENT STATISTICS OF THE MUSSEL OUTPUT.

The quantities of mussel shells which were taken by the fishermen and sold to the button manufacturers in 1897 and the first six months of 1898 are shown in the following table. The total output is seen to have been 3,817 tons in 1897 and 3,950.74 tons in the first half of 1898. For these quantities the fishermen received \$43,998 and \$38,868, respectively.

The predominating importance of the niggerhead mussels (*Quadrula ebena*) is apparent, as these constituted 89 per cent of the yield in the first-named year and 94 per cent in the latter. The sand shells are second in importance, and are taken in larger quantities than all the remaining species combined.

Quantities and values of mussels sold by the mussel fishermen on the Mississippi river in 1897 and 1898.

SPECIES.	TONS.	VALUE.
1897.		
Niggerheads.....	3,414.00	\$ 34,149
Sand shells	299.00	8,960
Muckets	81.75	287
All others.....	22.25	602
Total.....	3,817.00	\$ 43,998
1898 (first six months.)		
Niggerheads	3,709.00	\$ 36,891
Sand shells	102.60	1,662
Muckets	22.25	154
All others.....	12.89	161
Total.....	3,950.74	\$ 38,868

In 1897 the average prices per ton received by the fishermen were \$10 for niggerheads, \$29.97 for sand shells, \$3.51 for muckets, and \$27.06 for all others, the general average price being \$11.53. In 1898 the prices were \$9.95 for niggerheads, \$16.20 for sand shells, \$5.87 for muckets, and \$12.50 for the others, with a general average of \$9.84.

THE BUTTON INDUSTRY.

ORIGIN AND PRESENT IMPORTANCE OF THE BUTTON INDUSTRY.

The manufacture of buttons from the native fresh-water shells began in the United States in 1891, the inauguration of the business being made possible by the high tariff on imported buttons imposed by the tariff bill of 1890. This levied a duty of $2\frac{1}{4}$ cents per line per gross on shell buttons and 25 per cent ad valorem. In the customs act of 1897 the tariff on pearl buttons was fixed at $1\frac{1}{4}$ cents per line per gross and 15 per cent ad valorem.

The first person to engage in this business was Mr. J. F. Boepple, who had, for many years, been similarly engaged in Hamburg, Germany. On account of an abundance of suitable mussels in its vicinity, Muscatine, Iowa, was selected as the site of the first factory and has now become an important center for button manufacturing. Other towns on the Mississippi and its tributaries from time to time established works, until in 1898 there were twenty-one communities in Iowa and Illinois in which buttons were made. A remarkable development of the business was witnessed in 1898, no less than thirty-six factories being established during the first six months of that year.

It is reported that some time before the establishment of a permanent industry at Muscatine, an effort was made to maintain a factory on the Tennessee river; this, however, was unsuccessful and was soon abandoned.

Button-making is one of the principal businesses along that part of the Mississippi between Iowa and Illinois. It gives employment to large numbers of people, who would otherwise be idle, at what are considered good wages for such labor. It also supports a very important fishery, at which many hundred persons make a living. Besides the people thus directly connected with the business, many others in more than a score of towns are benefited, including merchants, machinists, boatmen, draymen, and transportation companies.

Other important features of the Mississippi river button industry are the transformation of a hitherto useless product into a valuable commodity and placing it on the markets at reasonable prices.

NUMBER, LOCATION, AND DESCRIPTION OF THE FACTORIES.

During 1897 and 1898 (to July 1), button factories were located at the following places on the Mississippi river, in Iowa and Illinois, the lowermost point being Fort Madison, Iowa, and the uppermost Sabula, Iowa:

Iowa.—Buffalo, Clinton, Davenport, Fort Madison, Muscatine, and Sabula.

Illinois.—Albany, Andalusia, Cordova, Keithsburg, New Boston, Quawka, and Port Byron.

The following table shows the growth of the button industry of the section of the Mississippi in question, the number of factories established each year being given:

Years when button factories were established on the Mississippi river in Iowa and Illinois.

YEAR.	MUSCATINE, IOWA.		OTHER PLACES IN IOWA.		PLACES IN ILLINOIS.		TOTAL.	
	Complete plants.	Saw works.	Complete plants.	Saw works.	Complete plants.	Saw works.	Complete plants.	Saw works.
1891.....	1						1	
1892.....	1						1	
1893.....								
1894.....								
1895.....	1		2				3	
1896.....	2		1				3	
1897.....	3	3	1	2	1	4	5	4
1898 (to July 1).....	3	25	3	2			5	34
Total.....	5	28	5	2	1	4	11	38

By far the larger number of these factories are small establishments at which only "rough blanks" are sawed; many of them should hardly be dignified by being called factories. In 1898 only eleven of them, located in Muscatine, Davenport, Clinton, Sabula, and Keithsburg, were plants where finished buttons were made.

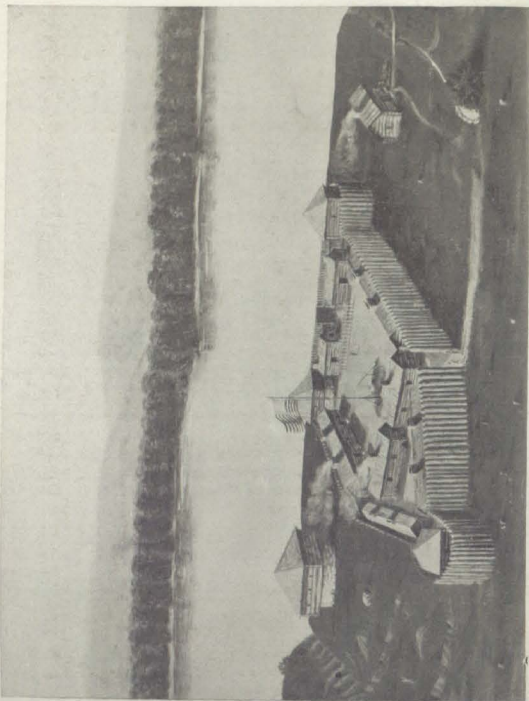
At Muscatine there were eight button-making establishments in operation in 1897, six of which began work in that year. By July 1, 1898, there were thirty-three factories in operation, and in the latter half of the year a number of others were opened. At other places named there were five factories in 1897, and sixteen in the first half of 1898.

The number of factories in the various towns in operation in 1897 and 1898 are shown in the following table:

LOCATION.	1897.			1898 (TO JULY 1).		
	Complete works.	Saw works.	Total.	Complete works.	Saw works.	Total.
Muscatine, Iowa.....	5	3	8	5	28	33
Davenport, Iowa.....	2		2	2		2
Clinton, Iowa.....						
Buffalo, Iowa.....				1		1
Ft. Madison, Iowa.....				1		1
Sabula, Iowa.....				2		2
New Boston, Ill.....	1		1	1		1
Keithsburg, Ill.....				1		1
Oquawka, Ill.....				2		2
Cordova, Ill.....				1		1
Fort Byron, Ill.....				1		1
Andalusia, Ill.....				1		1
Albany, Ill.....				1		1
Total.....	9	4	13	11	38	49

In addition to the foregoing factories along the Mississippi in Iowa and Illinois, to which this report especially relates, in 1898 there were factories

The Original Fort Madison. The present site of the Morrison Manufacturing Co.



at the following places in those states at which mussel shells from the Mississippi were utilized: Cedar Rapids, Vinton, and Charles City, Iowa, on the Cedar river; Coralville, Iowa, on the Iowa river; West Liberty, in the western part of Muscatine county, Iowa, What Cheer, Keokuk county, Iowa, Oskaloosa, Mahaska county, Iowa, and Aledo, Mercer county, Ill. Other button factories which get all or part of their raw material from the Mississippi are reported to be located in Chicago, Ill.; Cleveland and Cincinnati, Ohio; Janesville, Wis., and Omaha, Neb.

The factories at which the finished buttons are made are, as a rule, specially constructed two-story brick buildings of considerable size, having a cost value of \$5,000 to \$30,000, which sum includes land, buildings, machinery, and general equipment. A few of them occupy parts of mills or machine shops. Some of the plants at which only blanks are sawed are also in special brick or wooden buildings, but most of the "saw works" are in connection with machine shops or in improvised outbuildings of private residences; some of the smaller ones being in simple sheds. A single room is sufficient for the mere sawing of the rough blanks, but the various steps in the manufacture of the complete buttons necessitate a number of rooms and make the factory a very elaborate establishment, with the heavier machinery and rougher work on the first floor, and the different finishing processes on the upper floor.

The essential work at all the factories is done by machinery. At all the larger and many of the smaller establishments, the motive power is steam or electricity; some obtain their electric power from the city electric plant, some have independent dynamos, some have steam engines, and some use the power of adjoining machine shops or mills. A gasoline engine, of two or three horse power, furnishes the motivity for the saws at several of the small works, and foot power is also employed in a few places.

BUTTON-MAKING MACHINERY.

The business of supplying the factories with the necessary special machinery has become very important in Muscatine. The facility with which the cutting machines may be obtained, and their comparatively small cost, have been leading factors in the establishment of many of the button factories. At some large machine shops practically the entire work now consists in making and repairing apparatus used in button manufacturing and mussel fishing.

The following, taken from a Muscatine paper, illustrates the cost of the necessary machinery and the apparent profits of the machinists:

As so much has been said regarding the cost of producing pearl buttons, and so little about the cost of the necessary machinery required in their manufacture, attention is called to the following schedule, figuring on a 10-saw basis.

The cost of machinery and the price that it has been selling for allow a very handsome profit, and the business is now looked on as a money-making proposition, which is not overdone as some lines, but affords an opening for new concerns to engage in.

GRINDING MACHINE—		CUTTING MACHINE—	
Casting	\$ 3.50	Castings	\$ 2.80
Steel .....	.30	Steel .....	.30
Machine screws .....	.15	Machine screws .....	.10
Machinist, 10 hours' work	2.00	Machinist, 15 hours' work	3.00
Helper, 10 hours' work	1.00	Helper, 15 hours' work	1.50
Emery wheel	4.00		
Fan	5.00	Total	\$ 7.70
Automatic beveling machine	22.50	Ten cutting machines	\$ 77.00
Total	\$38.45	DRILLING MACHINE—	
Two grinding machines, with automatic beveling connection	\$ 76.90	Casting	\$ 4.00
TURNING MACHINE—		Steel .....	.60
Casting	\$ 4.00	Machine screws .....	.30
Steel .....	.60	Machinist, 20 hours' work	4.00
Machine screws .....	.30	Helper	2.00
Machinist, 20 hours' work	4.00		
Helper, 20 hours' work	2.00	Total	\$10.90
Automatic tool sharpener and emery wheel	2.70	Five drilling machines	\$ 54.50
Total	\$13.60	One sorting machine, comprising the rollers and cups	27.50
Five turning machines	\$ 68.00	Shafting, pulleys, and belting	123.00
		Polishing fixtures, consisting of tumblers, vices, etc.	60.00
		One sizing and grading machine	19.50
		Total outfit	\$506.40

Cutting machines that cost \$7.70 generally sell for \$28. The cost of a 10-saw plant complete, \$506.40; running expenses of manufacturer to produce this from raw material, \$60; total, \$566.40. Usual selling price for such an outfit as described above, from \$2,500 to \$3,000.

METHODS PURSUED IN THE BUTTON INDUSTRY.

The mussel shells, as purchased from the fishermen, are hauled from the boats to the factories in drays or wagons either owned or hired by the manufacturers, or in vehicles belonging to the fishermen. At the factory the shells are stored in covered sheds, the different kinds usually being kept in separate bins. Preparatory to being used, the shells are sorted into sizes by boys. Usually three sizes of "niggerheads" are recognized. Another preliminary step is the soaking of the sorted shells in barrels of fresh water for three to six days to render them less brittle. Even when only a few hours out of the river the shells become dry and brittle. It is necessary that they be used while wet, otherwise they crumble or split under the saw.

The next step is the cutting or sawing of the rough blanks. Each cutter has a pile of selected shells at hand, and, in the large factories, is kept supplied by boys. Niggerhead shells are usually held with special pliers while being cut; these grasp the circumference of the shell and enable cutters to retain it fast while holding the shell at right angles to saw. Some sawers have the hand gloved or mittened, and use no pliers or pin-cers. At the more extensive plants a fine jet of water plays on the shell as the saw revolves, in order to prevent the formation of dust and to keep the shell cool. The dust is very irritating to the respiratory passages and eyes of the cutters, and at some of the factories it is drawn into a tube by a current of air. The cutters in the smaller works often cover the mouth and nose with a cloth.

The saws are made of flat steel strips about two inches wide, and of various lengths corresponding to the sizes of the buttons. These strips, after being provided with fine teeth along one of the sides, are accurately bent into a cylindrical form and fitted into heavy iron holders; the latter are adjusted into a lathe in which they revolve on a horizontal axis. As the blanks are cut they pass back into the saw and holder and drop into a box beneath the saw.

From the cutting machines the blanks are taken to a weigher and recorder, who credits each man with the number of gross he cuts.

In all branches of the button industry a gross is considered as consisting of fourteen dozen, in order to make allowances for the imperfect or defective buttons that are liable to be produced at every stage of the business from the cutting of the rough blanks to the sewing of the finished buttons on cards.

By far the largest number of factories produce only rough blanks, which are sold to a local finishing plant or sent to large concerns in the east, some of which have established their own "saw works" on the Mississippi.

The next step in the making of the complete button is the dressing or grinding of the blank, to remove the skin and make an even surface. To accomplish this each blank has to be held with the finger against a revolving emery wheel.

Turning or facing is the next step. This, which is similar to the preceding, gives to the front of the button its form, including the central depression. This is followed by the drilling of two or four holes for the thread.

The button is now complete with the exception of the polishing process; this brings out the natural luster which has been lost in grinding, and which gives to these buttons their chief value. The buttons are placed in mass in large wooden kegs, known as tumblers, in which they are subjected to the action of a chemical fluid at the same time that the tumblers are revolving on a horizontal shaft. By mutual contact, combined with the effect of the fluid, the buttons become highly lustrous, while the fluid is churned into a milky froth. After being washed and dried the buttons go to the rooms where they are sorted into sizes and grades of quality, and then sewed on cards and packed in pasteboard boxes.

The daily capacity of the largest factories is 700 to 1,000 gross of finished buttons.

At Muscatine there is a small business in treating buttons to make them resemble "smoked pearl." This is a secret chemical process. The buttons so treated are usually those which exhibit defective coloration, such as yellow blotches, which would prevent their sale as first-class goods, but are otherwise perfect.

The unit of measure of the size of buttons is the line, which is one-fortieth of an inch. The buttons manufactured on the Mississippi are from twelve to forty-five lines in diameter. The largest buttons (forty to forty-five lines) are made from "niggerheads."

Following are the quantities of various sized blanks that may be cut from 100 pounds of average sized "niggerheads": Sixteen line, twenty-eight to thirty gross; eighteen line, thirty to thirty-two gross; twenty line, twenty-four to twenty-nine gross; twenty-two line, fifteen to twenty gross; twenty-four line, twelve to fifteen gross.

Sand shells of medium size and thickness yield the following per 100 pounds: Twenty line, sixty-four gross; twenty-six line, thirty-one gross.

A medium sized "niggerhead" produces four or five eighteen line or twenty line blanks. From the large shells eight or ten blanks may be cut. Sand shells average twelve to twenty line buttons. Larger sand shells yield sixteen to twenty buttons. The largest deerhorns may sometimes be cut into

twenty-five or thirty blanks; one shell is figured from which twenty-eight twenty line blanks were sawed.

THE FACTORY HANDS AND THEIR WAGES.

At the button factories on the Mississippi river in Iowa and Illinois a large number of persons are employed at wages generally regarded as good. Besides men, who have the more arduous and important duties, many boys and girls, who would otherwise be idle, are given employment.

In 1897 the employes in the button factories of Muscatine number 532; in the first half of 1898 the number had increased to 829; at the other places embraced in this report, 232 persons were employed in 1897 and 605 in the first six months of 1898, giving a total of 814 for 1897 and 1,434 for 1898. Of the latter 1,042 were males and 392 females.

In the factories in which finished buttons are made, from 30 to upward of 200 people are employed, the males and females being in about equal numbers. The factories which simply produce the "rough blanks" employ only males, the number of whom averages only 14, and only one such factory employs more than 30 persons. This is an extensive establishment in Muscatine, having 110 hands in 1898.

Taking a large Muscatine factory as an example, the following are the various capacities in which the employes are engaged:

NATURE OF EMPLOYMENT.	NO.
Cutters (all men)	53
Dressers and grinders (all boys)	30
Facers (girls)	30
Drillers (girls)	32
Sorters and carders (girls)	36
Packers, etc. (girls)	15
General employes (men and boys)	15
Managers and clerks	3

Total

The best wages are received by the cutters, who are always men. In the larger factories they are paid 5 to 10 cents a gross (14 dozen) for "rough blanks," according to size. Skilled men can cut from 150 to 200 gross of blanks per week, and can earn \$15, but the average is \$8 to \$10.

While the cutters are paid by the gross, the quantity is determined by weight, as too much time would be lost in actually counting the blanks. A scale of weights per gross for blanks of different sizes is established. Thus, 1 gross of 20-line sand-shell blanks weighs 1½ pounds.

The pay of grinders is 1½ to 2½ cents a gross, or from \$5 to \$7 a week. Dressers are paid 1 to 2 cents a gross, and make about \$4.50 a week.

Facers receive 2 to 3 cents a gross, and earn \$4 to \$6 a week. They are usually young women.

Drillers are paid 1½ to 3½ cents a gross, and make about \$5 a week.

Those who sort the buttons into lots homogeneous as to size and quality are paid by the day, and earn about \$3.75 a week.

The price paid for sewing the buttons on cards is 3 cents a gross. The girls who do this work make \$4 or \$5 a week.

Those who pack the carded buttons in boxes and the boxes in the shipping cases are paid \$5 a week.

PRICES AND MARKETS FOR BUTTONS.

It was very generally reported in 1898 that the button industry was being overdone by the establishment of numerous small factories at which rough blanks were sawed. Many persons engaged in the business without the proper equipment or experience, and the very short life of some of the factories shows that the remarkable increase in the business in 1898 was not a healthy growth. Some of the output was not of standard quality, and a general lowering of prices has been a result.

The prices received for rough blanks in 1897 and 1898 ranged from 10 to 20 cents a gross, depending on size and quality. The prices correspond rather closely with the sizes, an 18-line blank, for instance, bringing 18 cents a gross, but as a rule the prices were less than the figures representing the sizes of the blanks, being 1 to 3 cents "under the line." The average size of the rough blanks was 18 or 20 lines, and the average value per gross was 16 or 18 cents.

The wholesale prices received for the finished buttons have been a little over double those of the rough blanks of the same sizes. The average prices for complete buttons in 1897 and 1898 were 35 to 40 cents a gross. The following were the ruling prices for buttons of the stated sizes and qualities during the past year as furnished by one of the leading firms:

FIRST GRADE.		SECOND GRADE.		THIRD GRADE.	
SIZE.	Per Gross.	SIZE.	Per Gross.	SIZE.	Per Gross.
	Cents.		Cents.		Cents.
16-line.....	55	16-line.....	50	16-line.....	40
18-line.....	60	18-line.....	55	18-line.....	45
20-line.....	65	20-line.....	60	20-line.....	50
22-line.....	70	22-line.....	65	22-line.....	55
24-line.....	75	24-line.....	70	24-line.....	60

In addition to the foregoing, a superfine button is manufactured which sells for about 15 cents per gross more than the first grade, and a cheap button, used chiefly by shirt makers, which brings from 25 to 30 cents a gross.

There was naturally some difficulty at first in putting on the market buttons made from our native fresh-water shells, but the demand was rapidly developed, as the quality and price of the buttons became known, and at present Mississippi river buttons are sold in every state and territory and in Canada. It is reported that orders have recently (1899) come from England.

UTILIZATION OF WASTE.

In sawing the blanks a large part of the shell can not be used, as it is incapable of being made into merchantable buttons. The relatively thin margin of the valves and the thick beak or umbo furnish the principal waste. The amount of unserviceable raw material is extraordinarily large, although it varies with the different species and to some extent with the different factories. In the aggregate it probably represents over 75 per cent of the weight of shells handled, and, according to the testimony of the manufacturers, with the principal mussel employed, the "niggerhead," from 85 to 93 per cent by weight, is discarded in sawing blanks, the average

loss of material being about 90 per cent. In facing, grinding, drilling, and polishing the blanks, and in defective blanks, there is a further waste, estimated at 20 to 50 per cent of the original weight of the blanks. With "sand shells," "deerhorns," and some other species, the waste is much less, amounting to probably only 50 per cent, all told.

As the accumulation of waste soon proves a nuisance, the factory owners are naturally desirous of finding some uses to which it can be put. If a market could be found for it, even at a very low price, it would be a decided boon to the industry. Many of the manufacturers feel that it has a value, but they have not been able to discover a way in which to dispose of it for any financial consideration, and practically the only use to which it has been put has been in making roads, the municipal authorities hauling it from the factories. As a rule, the manufacturers are glad to get rid of it in this way, and some of them have even paid to have it taken away.

Farmers occasionally call for small quantities of finely broken shells for use as food for chickens and turkeys, but the demand is very limited. In the opinion of the United States Department of Agriculture, the value of the shells for such a purpose is considerable, and at least one factory has introduced a special machine for reducing the shells to small fragments of uniform size, with rounded edges.

In sawing, grinding and drilling the blanks, a fine white powder results. Much of this has been saved by the button manufacturers in the hope that some use may be found for it. Small quantities have from time to time been given to farmers to experiment with as a fertilizer, but no demand for it has been created, and its value in this respect has only been conjectural. In order to obtain an authoritative opinion as to the feasibility of employing this powder as a fertilizer, the United States commissioner of fish and fisheries submitted a sample to the secretary of agriculture, who reported as follows:

The fine-ground powder, which is the refuse of the pearl button industry, transmitted to me in connection with your letter, has been examined by the chemist of the department and found to be almost pure carbonate of lime. It will prove valuable fertilizing material for stiff clay soils and for other soils deficient in lime. In the fine state of subdivision in which it exists, it could be applied directly to the soil without further preparation. I should advise persons engaging in this industry to communicate with the directors of the agricultural experiment stations of their respective states in regard to the utilization of this waste material for fertilizing purposes.

This powder without further preparation is undoubtedly excellent for polishing coarse metalware, and, if screened to remove any larger particles, may even be used for cleaning and polishing silverware, cutlery, etc.

The use of the powder in stucco work has also been suggested.

AVOIDABLE WASTE OF RAW MATERIAL.

Although, under the most favorable circumstances, there is a very large loss of material that cannot be avoided, at the same time there is a certain amount of preventable waste that, in the aggregate, must represent many thousand gross of buttons annually. This waste consists in the failure of the sawers to utilize all the available shell, and naturally varies greatly with different men and different factories.

The accompanying illustrations of shells that were picked almost at random from the discarded heaps of certain Muscatine factories clearly indicate, even to a person not versed in the button business, the unnecessary waste of material, and render scarcely needful the presentation of contrast illustrations, showing the buttons that may be cut from such shells.

From the waste heap of one manufacturer, thirteen "niggerhead" shells were picked at random; from these, twenty-six rough blanks had been cut, of which nineteen were capable of being made into salable buttons. The same shells were taken to another factory, where forty-eight additional good blanks were cut. Here was an avoidable loss of 65 per cent.

Another example of waste, and probably an extreme one, was recorded in a Muscatine paper in August, 1898. A button manufacturer picked up sixteen shells from a pile that was being spread on a road. From these thirty-one blanks had been cut. He took the discarded shells to his factory and sawed out 153 merchantable blanks. In other words, 83 per cent of the raw material had been wasted.

It is not to be supposed that the manufacturers sanction the waste of material in cutting blanks. The trouble is that the cutters are often careless or inexperienced, and cannot always be kept under the supervision of the foreman or manager. As the cutters are paid for the blanks they cut, it is decidedly to their personal advantage to get as many blanks as possible out of each shell they handle, as there is loss of time in throwing one shell away, taking a new one, and fitting it to the saw.

STATISTICS OF THE BUTTON INDUSTRY.

In the following series of tables the extent of the button industry of the Mississippi river is shown for the calendar year 1897 and the first six months of 1898. At the time of the investigation the season was not over and no complete statistics for 1898 could be obtained. It should therefore be borne in mind that the figures given for that year represent less than half the extent of the business, as a number of new factories were established after July 1st.

Outside of Muscatine, there are only from one to three factories in any one place; and in order that private interests may not be disclosed, the statistics for all the factories in each state are combined.

The 814 persons employed in 1897 are shown to have received \$157,650 in wages, while the 1,434 employed in the first half of 1898 were paid \$133,980.

The capital invested in the button manufacturing business, in buildings, machinery, equipment and land, was \$118,300 the first year and \$171,435 the second.

The cost of raw materials used in button-making was \$40,408 in 1897 and \$37,008 in 1898, these amounts representing 3,602 tons and 3,641 tons, respectively.

The manufactured products consisted of 463,200 gross of buttons and 673,300 gross of blanks in 1897, and 399,489 gross of buttons and 761,113 gross of blanks in 1898. The market value of the buttons and blanks was \$243,655 in 1897, and \$352,570 in 1898.

Persons employed and wages paid in the button industry of the Mississippi river in 1897 and 1898.

LOCALITIES.	MALE.		FEMALE.		TOTAL.		WAGES.	
	1897.	1898.	1897.	1898.	1897.	1898.	1897.	1898.
	Muscatine, Iowa.....	334	590	198	229	532	839	\$129,100	$ 87,800
Other places in Iowa.....	87	168	113	149	261	311	11,880	23,150
Places in Illinois.....	105	284	97	30	133	214	25,790	32,900
Total.....	526	1,042	288	392	814	1,434	\$157,650	\$133,980

Capital invested in the button industry of Iowa and Illinois in 1897 and 1898.

LOCALITIES.	1897.	1898.
	Muscatine, Iowa.....	\$ 77,300	$ 98,705
Other places in Iowa.....	23,000	34,000
Places in Illinois.....	18,000	38,730
Total.....	\$118,300	\$171,435

Quantities and values of mussel shells used in the button industry of the Mississippi river in 1897 and 1898.

LOCALITIES WHERE USED.	NIGGERHEADS.		SAND SHELLS.		MUCKETS.		ALL OTHERS.		TOTAL.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
	1897.									
Muscatine, Iowa.....	2,209.00	\$34,184	164.00	\$5,410	31.75	\$187	17.25	\$503	3,532.00	\$30,283
Other places in Ia.....	450.00	3,675	.....	.....	.....	.....	5.00	100	450.00	3,675
Places in Illinois.....	525.00	5,250	50.00	1,000	60.00	100	.....	.....	635.00	6,450
Total.....	3,284.00	\$38,109	214.00	\$6,410	.....	.....	.....	.....	4,002.00	\$40,408
1898.										
Muscatine, Iowa.....	2,216.00	\$4,175	30.90	\$47	26.25	154	10.30	149	2,273.24	\$5,025
Other places in Ia.....	741.00	5,863	2.50	15	.....	.....	.....	.....	744.00	5,882
Places in Illinois.....	673.00	5,591	50.00	600	.....	.....	2.00	10	1,246.00	6,101
Total.....	3,629.00	\$35,631	73.10	\$1,062	26.25	\$154	12.89	\$161	3,641.24	\$37,008

Quantities and values of finished buttons and rough blanks made in the button factories on the Mississippi river in 1897 and 1898.

YEARS AND LOCALITIES.	FINISHED BUTTONS.		ROUGH BLANKS.		TOTAL BUTTONS AND BLANKS.	
	Number of GROSS.	Value.	Number of GROSS.	Value.	Number of GROSS.	Value.
	1897.					
Muscatine, Iowa.....	313,200	\$ 109,270	418,200	\$ 66,385	731,400	\$ 175,655
Other places in Iowa.....	110,000	93,000	.....	.....	110,000	33,000
Places in Illinois.....	40,000	10,000	225,000	25,000	265,000	35,000
Total.....	463,200	\$ 162,270	673,200	\$ 91,385	1,136,400	\$ 243,655
1898.						
Muscatine, Iowa.....	177,696	68,554	541,190	84,321	718,816	159,885
Other places in Iowa.....	195,793	69,767	48,000	6,040	243,793	73,808
Places in Illinois.....	35,000	8,000	171,993	20,878	197,963	28,878
Total.....	399,489	\$ 146,321	761,113	\$ 111,249	1,160,602	\$ 282,570

RECOMMENDATIONS.

In view of the very general desire of those peculiarly interested in this industry that some recommendations be made by the United States Fish Commission regarding the measures that seem necessary for preventing the further depletion of the mussel beds and the consequent curtailment of all branches of the business, the following suggestions are submitted. It should, however, be understood that the perpetuation of this important industry depends wholly on the joint action of the states concerned, and that the general government and the United States Fish Commission are entirely without jurisdiction. The measures here advocated will, it is thought, be generally endorsed by the button-makers, a large majority of whom have been consulted regarding this matter; they should also commend themselves to the fishermen, who are vitally interested in having the mussel supply maintained.

First.—The gathering of small mussels should be prohibited, and a minimum legal size for each important species should be prescribed by law.

The following are the minimum sizes of the principal shells that should be gathered, the figures referring to the greatest diameter: Niggerheads, $2\frac{1}{2}$ inches; sand shells, 4 inches; mucketts, 4 inches.

A niggerhead $2\frac{1}{2}$ inches long will yield from 8 to 10 buttons 18 to 20 lines wide. A sand shell 4 inches long contains from 8 to 12 buttons of the same size, and a mucket about the same number.

Second.—Immediately prior to and during their spawning season the principal species should be unmolested, and a close season should be fixed by law.

The question of a close season presents some difficulties in view of the widely different spawning times of the various species of mussels. Probably the only species that need to be considered at this time are the "niggerhead," the "mucket" and the "sand shell." The normal spawning time of the "niggerhead" in the central part of the Mississippi basin is late winter and early spring, chiefly the months of February, March and April, while the spawning time of the "mucket" and "sand shell" is the summer and early fall.

The "niggerhead" is so much more important than all of the other species combined that protective legislation addressed to it alone would prove perhaps sufficient, in view of the desirability of reducing the fishing season as little as practicable. The measure, therefore, which would probably accomplish the most good would be the establishment of a close time for "niggerheads" from January 1st, or the time of ice formation in the Mississippi, to May 1st.

Third.—Provision should be made for the prevention of damage to the beds by sewage and factory refuse.

The damage to the mussel beds in the Mississippi river in Iowa and Illinois by river pollution is to a large extent prospective, but adequate steps should be promptly taken to obviate this source of injury. The effect on animal life—especially that on the bottom—of the discharge of city and factory refuse into streams has hardly been considered by those interested in the preservation of the mussels, but it constitutes, perhaps, the most serious menace to the industry, in that the destruction wrought is inevita-

ble and complete. Mr. Simpson thus refers to the injury to mussels which is caused by antiquated methods of disposing of refuse:

The dumpings of manufactories and the sewage of cities turned into rivers is destroying not only the fish but the *Natades*. In many places below factories or cities the water of the streams is offensively foul and wholly changed in color, so that practically no kind of organic life can exist in it. Along the Potomac and Shenandoah rivers, in the vicinity of Harper's Ferry and above it, are a number of mills which grind wood into a pulp for the manufacture of paper. These throw their sawdust and waste into the streams, and down below, where the water is comparatively quiet, it settles to the bottom, forming great masses of slushy, putrid matter, which is, no doubt, destructive to fish and unios. The city of Chicago is about to turn its sewage into the Des Plaines river, from which it will be carried into the Illinois river, a stream abounding with the very finest freshwater mussels. There can be but little doubt that this great volume of filth and poison will destroy every *Natad* in both of these streams, and possibly it may exert its deleterious influence even on the Mississippi river also.

Fourth.—In order that local industries may be fostered and the catch of mussels made no larger than can be utilized by the factories in the vicinity, the matter of prohibiting the shipment of shells to distant states should be considered.

There is little doubt that the button factories now in operation in Iowa and Illinois can more than consume all the mussels that should be gathered from the section of the river under discussion. It is held by some persons having pecuniary interests at stake that the raw materials should be reserved for those who have invested their capital in permanent improvements and have established local industries, and that the continuance of the business should not be endangered by unrestricted shipment of shells to distant states and countries.

Fifth.—Button manufacturers should exercise greater care in utilizing their shells in order to reduce the waste of raw material.

This subject has already been sufficiently discussed.

The views referred to in the above article could not be obtained, therefore could not be reproduced here.

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