State of Iowa
1924

REPORT OF THE

STATE BOARD OF HEALTH

FOR THE

BIENNIAL PERIOD ENDING JUNE 30, 1924

RODNEY P. FAGEN, M. D.
Secretary

Published by
THE STATE OF IOWA
Des Moines

LETTER OF TRANSMITTAL

HON. N. E. KENDALL, Governor of Iowa:

SIR: In accordance with the provisions of Section 2565 of the Code, I have the honor to present the twenty-first biennial report of the State Board of Health for the period commencing July 1, 1922, and ending June 30, 1924.

RODNEY P. FAGEN, M. D., *Secretary.*

Des Moines, December 31, 1924.

REPORT OF STATE BOARD OF HEALTH

Health Pays. Everywhere the belief that "health pays" is growing. In the office of the Iowa State Board of Health the ever increasing demands make this very clear. Requests for help come from the physician who has immediate need for anti-rabic vaccine and antitoxin or a report on a specimen; from the exasperated tax payer who objects to the stable in his neighbor's back yard; from the local registrar of a remote village who is interested in having all births and deaths properly recorded with the State. Requests also come from the corporation which seeks the advice of the Sanitary Engineer or examination of the water supply, or it may be from the rural mother far from a physician who wants to know how to feed her baby. The same mail brings inquiries if not requests from individuals and communities in need of aid or advice in solving a personal or a community health problem. The number and character of these requests or demands is most encouraging. They imply an understanding of why there are boards of health and are expressions of the conviction that every citizen is entitled to prompt and efficient health service.

Local Health Boards Necessary for State Health. While this expression of a more universal demand is gratifying, it is embarrassing to the State Board, for its function is largely one of direction or supervision with emergency aid when needed. The law provides for local organization and local health officials, but we lack the strong local machinery necessary for State health. There are 1,100 community health officers on our list. With the exception of the six full-time health officers, these officials serve only part time and are all underpaid. Most of them get little support from the communities in which they hold office. Our imperative need in Iowa is local health supervision and service on a district or county basis, to give the same protection which is afforded in counties and communities in other states where there are trained full-time health officers with adequate assistants.

Six Cities and Two Counties With Full-Time Service. In spite of many hadicaps we are fortunate in being able to report that the routine work has been successfully carried on and much progress made during the past two years in a number of the bureaus of the State Board of Health. The operation of health units in two coun-

ties, and disease control programs in different sections of the State are pertinent examples. The Health Unit is financed on a fifty-fifty basis by the County (one-half), the State Board of Health (one-fourth), and the International Health Board (one-fourth). A budget of $10,000 makes it possible to employ a full-time director, a competent public health nurse, a stenographer and one or more sanitary inspectors. This service implies protection from communicable diseases; examination of school children with some follow-up work; the investigation of sanitary conditions in the various communities; inspection of food supply places, and a general educational program in the essentials of personal and community hygiene. The Counties organized now are: Dubuque and Washington (financed by the County, International Health Board and State Board of Health.) The value of these demonstrations for the protection of the health of the people is indicated in the detailed reports of the two Counties.

Communicable Diseases. While there has been amazing progress in scientific knowledge of how to fight diseases in the past fifty years, popular control measures have not kept pace with this advance. Diseases still prevail which should have been elminated or under better control. Vaccination will prevent smallpox, but in the two years—1922 and 1923—we had many fatal cases. Many of these cases, it is true, came from outside, especially from adjacent states, but if the public fully believed in vaccination as a measure of prevention, there would be a compulsory law effectively administered.

The Schick Test. There has been a slight decrease in the death rate from diphtheria, but an increase in the number of cases. The futility of expecting to reach all cases of diphtheria in the early stage has been proved in other states; therefore, we welcome the painless and harmless procedure of the Schick test discovered by Dr. Schick of Vienna only a few years ago. By this test the susceptibility of any individual to diphtheria can be determined and those persons who are susceptible can be safely immunized by the use of toxin-antitoxin.

Lowered Typhoid Rate. The State has met with as great, if not greater, success in its fight against Typhoid than against any other disease. The death rate per 100,000 population in 1910 was 17.2. Year by year, with a few reverses, this has been reduced until in 1922 the rate was 3.4 per 1000,000, the lowest rate of which we have record. No doubt many things have combined to produce

this result; better safeguarding of water supplies, better sanitary arrangements, more vaccination, better care of milk, more abatement of the fly nuisance, better detection of carriers, and the many other factors that combine to protect the public.

Venereal Disease Work. The experience of the past two years in venereal disease work has been peculiarly trying. The cessation of Federal funds for this work necessitated the limiting of our activities along lines which, from a public standpoint, there is every reason to keep up and to extend. We have continued to supply arsphenamine for syphilitic treatment at the clinics and to physicians and have no reason to be discouraged at the attendance in the various clinics under our direction. The hospitals have given generous co-operation. We are convinced that our method is sound, but realize we have made only a beginning and that the problem is one of the most important in the health program.

Cancer Eradication. In common with other states, we are deeply concerned at the number of deaths each year from cancer. In 1922 there were 2,147 deaths (all forms); in 1923, 2,367. As the education of the public in early diagnosis and treatment is the only present means of lessening the number of deaths, active assistance is given each year in carrying out the cancer program outlined by the American Society for the Control of Cancer. They supplied thousands of leaflets free which were distributed widely with letters urging organizations to enlist their members in this propaganda.

Tuberculosis Not Yet Controlled. Tuberculosis remains the great scourge among communicable diseases not yet controlled. In this biennium there were 2,130 deaths from pulmonary and other forms of tuberculosis. For the care and treatment of curable cases there is an increasing provision made in addition to our State Sanitorium at Oakdale, by the establishing of many county tuberculosis hospitals such as Broadlawns, of Polk County. Educational work along this line has been carried on by the Iowa Tuberculosis Association without any State aid, but there is an appropriation of $5,000 annually made to the State Board of Control for educational purposes.

There is needed a Bureau of Tuberculosis Control with the State Department of Health, with public health nurses; provision still maintained for using our division of vital statistics and laboratories for diagnostic service. An intensive statewide educational program is also needed.

Epidemiological Reports. A supply of report cards for which we have the franking privilege is sent to each physician at the beginning of every month. The report calls for a number of details which it is assumed the physician will know. We have established interstate reciprocal notification for any person having a communicable disease. When advised that such a person is entering the State, notice is sent to the city health officer, and when reported as leaving Iowa we advise the health officer of the state to which he is going. The epidemiological work is directed by the Secretary's office.

Bacteriological Laboratories. The records of the bacteriological laboratories (central laboratory) show a gratifying increase in the number of specimens sent for examination—552,843 for the two years. For diphtheria there were 69,101 examination; blood for typhoid, 3,298; Wassermann reaction (blood), 72,961; dog brains for rabies, 254 (positive 116); (negative or unsuitable 128.) No attempt can be made to estimate the value in the preservation of life and health which may have been the result of this free service offered by the State Board of Health.

Water and Sewerage. The review of designs for proposed water supply and sewerage systems is an important feature of the Board's work. During 1922-1923 plans and specifications for 32 water supply and 65 sewerage systems were examined and approved. In a number of instances revisions were required before approval could be given.

The Board has continued to make field inspections and laboratory examinations of water supplies used by common carriers in interstate traffic, in order to provide for the certification required by the Treasury Department.

Conservation of Child Health. The object of Child Hygiene is to conserve and promote child health. This includes effort for complete birth registration, prenatal, postnatal and infant care; care of the child of the pre-school age as well as the school child; instruction of midwives; a program in educational hygiene and, if possible, the training of public health nurses. The Federal appropriation for maternity and infancy work offered each State given to State University. With an inadequate budget it was impossible for the State Board of Health to do more than specialize in the most needed phases of the work. This being educational, we have continued to send literature to the schools and teachers, to

distribute pamphlets on prenatal, infant and child care furnished us by the Children's Bureau in Washington, for which we have the franking privilege, and to use other methods of getting facts before the groups interested.

It is the special purpose of this Bureau to reduce the number of possible preventable deaths from puerperal causes; to lessen the appalling number of stillbirths, and to reduce the high infant mortality rate. The high death rates of women in child-birth and infants under one year are due to a lack of prenatal education, proper obstetrical service and knowledge of infant care.

Objection of Birth Registration. The aim of the Bureau of Vital Statistics is to secure and exact records of the important facts concerning the birth and death of every citizen or resident of the State of Iowa, and from such records to make card indices and classified tabulations so the information secured may be available on inquiry and permanently kept for possible future use. Every State needs to have a record of the total number of births occurring annually in the State; the birth rate, that is number of births per thousand; birth rates by races; number of illegitimate births; number of still births attended by physicians, by midwives; number of white births attended by physicians, by midwives; number of colored births by (colored) physicians, by midwives, and these data differentiated for each parish and city. When properly compiled these facts give opportunity to compare the condition of one County with another and our State with other States and with foreign countries.

In respect to deaths we need: number of deaths annually; death rate—that is number per thousand; deaths by races and death rate by races; number of deaths of children under two as compared with births; total number of deaths by months and year from each of the causes in the International List of Causes of Deaths; deaths according to age, occupation; and "seasonal" deaths according to months.

Progress in Vital Statistics. The progress made by the Bureau of Vital Statistics has been marked from year to year. Formerly the work was accomplished under very adverse physical surroundings, the rooms being over-crowded and without space for proper filing cabinets or vaults for the bound certificates. This condition was remedied in 1924, more suitable space having been apportioned by Curator Harlan of the Historical Department. The extension of the work will soon outgrow present quarters, but for the present

they are adequate. The Bureau secures the birth and death certificates through approximately eight hundred and twelve local registrars, appointed by the County Board of Supervisors with the approval of the State Registrar; these registrars collect certificates in 812 registration districts, the boundaries of which are generally well defined.

The County pays the local registrar, twenty-five cents each for complete certificates. The reports are due in the office of the State Board of Health on the 11th of the month succeeding the month in which the birth or death occurred. A large number of incomplete certificates are received; these are queried for items of missing information which are often not obtainable. The certificates are classified and tabulated according to County and registration district and then permanently bound.

Iowa was admitted to the Registration Area for deaths in 1923. During the compiling of this report we have been admitted in the Registration Area for births.

The number of births received for 1922 is 50,736; for 1923, 51,305. Number of deaths for 1922, 24,065; 1923, 25,236.

Crude death rates do not tell the whole story regarding the healthfulness of a city or state. Race, occupation, sex and age distribution of the population, and the relative number of non-resident deaths must be considered. Some tables are presented having such classification as we have been able to make with a limited force. It is the purpose of the Bureau to work toward a complete presentation of all the facts necessary for a just comparison of conditions.

Revised Sanitary Code. In October, 1922, the new Sanitary Code was promulgated. The many requests for copies are proof of the practical value of definite and explicit regulations as a guide for local boards and as authority for those who would enforce laws and regulations which protect the public against insanitary practices and the spread of communicable diseases.

Public Health Nursing. While there are no funds available for the State Board of Health to direct Public Health Nursing activities, the work has been accomplished through the co-operation and financial support of the Iowa Tuberculosis Association, which association has paid the salary and furnished necessary clerical assisance for the directing of this work. A detailed report of the Public Health Nursing activities is found in this biennial.

Educational Literature. Every possible opportunity for the stimulation of interest in health work is embraced. Newspaper articles,

leaflets and pamphlets on subjects pertinent to conditions, exhibits, moving picture entertainments and lectures make up the program of the general educational work. The utmost care is exercised in the preparation of the Quarterly Bulletins, leaflets, pamphlets, posters and other printed matter. The number of Quarterly Bulletins, Weekly Morbidity Reports, Monthly Reports, and pamphlets on contagious diseases amounted to over 5,000,000 during the two years.

Housing. During the biennial there were 8,621 residences constructed in accordance with the housing law, in the fifteen cities where this law is mandatory. The new mining camps have been constructed, one of which (Buxton No. 20) is the largest camp in the State. In this camp every house is constructed in strict accord with the law.

While the law is mandatory only in cities of 15,000 population or more, the same has been effective in practically every town in the State, for the reason that people seem to appreciate that complying with the housing law in general is an advantage not only from the health standpoint, but from a monetary side.

Co-operation. During the past two years there has developed a better understanding between the medical profession and the State Board of Health in regard to the policies and activities of the Board. Organization and re-organization of Medical Societies has been encouraged and meetings of these societies attended. As a result the relation between public health activities and professional work, and the ultimate aim of public health work and professional activities has become clearer to all. The cordial relations which have existed between women's organizations and the State Board continue. Local organizations and State Federations are always willing to assist in any form of health work suggested. We have had cordial support also from other State Departments such as Board of Education, Bureau of Labor, Agriculture Department, Board of Control, State University, and State College Extension Divisions.

Iowa Healthful. The decline in the mortality rate in Iowa from 10.1 per 1,000 in 1921 to 9.9 per 1,000 in 1922 plainly indicates improvement in the general health of the population.

Vital Needs. Among the needed additional activities the most imperative is the organization of County Health Units, and the employment of a well trained, conscientious and efficient physician

as Director of the Unit, with necessary provision for co-operation with county hospitals. Other States spend hundreds of thousands of dollars each year for the maintenance of county health units. It is a paying investment in the prevention of disease and the promotion of health.

FINANCIAL STATEMENT

STATE BOARD OF HEALTH—	
Appropriated for biennial period	$ 20,000.00
Expended for biennial	12,277.65
Unused balance returned to general revenue	$ 7,722.35
BACTERIOLOGICAL LABORATORY—	
Appropriation for biennial period	$ 30,000.00
Expended for biennial	30,000.02
Overdrawn	.02
ANTITOXIN DEPARTMENT—	
Appropriation for biennial period	$ 4,000.00
Expended for biennial	3,984.43
Unused balance returned to general revenue	$ 15.57
VITAL STATISTICS DEPARTMENT—	
Appropriation for biennial period	$ 20,000.00
Expended for biennial	16,027.81
Unused balance returned to general revenue	$ 3,972.19
HOUSING DEPARTMENT—	
Appropriation for biennial period	$ 10,000.00
Expended for biennial	9,613.00
Unused balance returned to general revenue	$ 387.00
MEDICAL EXAMINER'S DEPARTMENT—	
Amount of fees paid treasurer during biennial period	6,332.00
Expended for biennial	2,615.68
Unused fees returned to general revenue	$ 3,716.32
OPTOMETRY DEPARTMENT—	
Amount in fees carried forward June 30, 1922 (2583-s)	$ 500.00
Amount fees paid treasurer during biennial period	2,461.00

Expended for biennial	1,107.91
Carried over June 30, 1924 (2583-s)	500.00
Amount unused fees returned to general revenue	$ 1,353.09
PODIATRY DEPARTMENT—	
Amount fees paid treasurer during biennial period	$ 361.00
Expended for biennial	194.24
Unused fee returned to general revenue	$ 166.76
NURSE'S DEPARTMENT—	
Amount fees carried forward June 30, 1922	$ 500.00
Amount of fees paid treasurer during biennial period	4,966.00
Expended for biennial	3,028.24
Amount carried over June 30, 1924	500.00
Unused fees returned to general revenue	$ 1,937.76
EMBALMERS DEPARTMENT—	
Amount of fees paid treasurer during biennial period	$ 4,438.00
Expended for biennial	2,616.22
Unused fees returned to general revenue	$ 1,821.78
PLUMBING DEPARTMENT—	
Amount fees available July 1, 1922	$ 754.75
Amount fees paid treasurer during biennial period	87.00
Amount in fees available July 1, 1924	$ 841.75
BUREAU OF VENEREAL DISEASE CONTROL—	
Appropriated for biennial period	$ 57,463.97
Expended for biennial	57,463.97

BOARD OF MEDICAL EXAMINERS

Total number of physicians registered and practicing in this state June 30, 1924, (estimated)	3,800
Number of certificates issued upon examination	103
Number of certificates issued by reciprocity	80
Total number of certificates issued during biennial period	183

OPTOMETRY DEPARTMENT

Number of certificates issued upon examination	40
Number of certificates issued by reciprocity	19
Total number of certificates issued during biennial period	59

EMBALMER'S DEPARTMENT

Number of licenses issued upon examination	202
Number of licenses issued by reciprocity	16
Total number of licenses issued during biennial period	218

Total number of Disinterment Permits issued during biennial period 1,487

NURSE'S DEPARTMENT

Number of certificates issued upon examination..... 669
Number of certificates issued by reciprocity..... 45

Total number of certificates issued during biennial period..... 714

PODIATRY DEPARTMENT

Number of certificates issued upon examination..... 6
Number of certificates of exemption issued..... 6

Total number of certificates issued during biennial period..... 12

NUMBER OF EXAMINATIONS HELD DURING BIENNIAL PERIOD
July 1, 1922, to June 30, 1924

Number of examinations held for Physicians..... 5
Number of examinations held for Nurses..... 8
Number of examinations held for Embalmers..... 4
Number of examinations held for Optometrists..... 6
Number of examinations held for Podiatrists..... 2

DETAILED STATEMENT OF FEES COLLECTED
July 1, 1922 to June 30, 1924

Physicians' examination, reciprocity and certification fees....$	6,332.00
Nurses' examination, reciprocity and certificate fees.....	4,966.00
Embalmers' examination, reciprocity, renewal and license fees	4,438.00
Optometrists' examination, reciprocity and renewal fees.....	2,461.00
Certified copies birth and death certificates.....	480.00
Podiatry exemption, renewal and examination fees.....	361.00
Mattress inspection fees	50.00
Plumbers' license fees	33.00
	$ 19,121.00
Paid to State Treasurer as shown by vouchers and receipts on file .....$	19,121.00

ANTITOXIN DEPARTMENT

During this biennial period, July 1, 1922, to June 30, 1924, we distributed from this office antitoxin as follows:

Diphtheria Antitoxin:
29,977 packages

Tetanus Antitoxin:
7,220 packages

Typhoid Vaccine:
7,031 vaccinations

Smallpox Vaccine:
48,494 vaccinations

Pasteur treatments for dog bites—rabies:
254 treatments for prevention of rabies

The above figures represent only the goods furnished from our emergency at the state house. A large portion of the antitoxins and vaccines used were sent direct to the communities by the manufacturer. We estimate that these figures show 75 per cent of all the antitoxins and vaccines furnished under the state contract.

CONTROL OF COMMUNICABLE DISEASES

Plans for the control of the communicable diseases have been given to communities in the State of Iowa, and epidemiologists has been sent to give personal assistance, and detail reports are on file according to location and in number per month as follows:

1922-23		1923-24	
July	15	July	6
August	17	August	5
September	16	September	5
October	27	October	20
November	25	November	22
December	16	December	18
January	23	January	24
February	17	February	27
March	17	March	25
April	17	April	18
May	10	May	11
June	7	June	7

BUREAU OF VENEREAL DISEASE CONTROL

WILBUR S. CONKLING, M. D., Director

Thirteen clinics for treatment of the indigent were maintained in the following cities: Des Moines, Dubuque, Clinton, Fort Dodge, Grinnell, Sioux City 3, Ottumwa, Council Bluffs, Marshalltown, Davenport, Manly and Iowa City; these clinics, with the exception of Iowa City which is a State Clinic, are supported by the local counties or cities. They have been subsidized with $3,000, which was divided according to the amount of work done in the clinic, the medication being furnished by the Bureau.

New cases admitted and treated are classified as follows:

	Syphilis	Gonorrhea	Chancroid
Male	843	654	8
Female	615	441	1
	1,458	1,095	9

The total number of consultations, treatments and visits to the clinics was 54,442.

Total number of doses of arsphenamine or similar product administered was 16,672.

In addition to the work of the clinics, private and city physicians administered free of charge 5,764 doses of arsphenamine or similar product to indigent patients in towns where we do not have clinics, the medication being furnished by this Bureau.

There were 68,211 Wassermann Tests made, of which 11,945 were positive, the balance being either negative or rejected. There were 4,716 gonorrheal tests made of which 862 were positive.

Physicians from all of the counties in the State availed themselves of the use of the V. D. Laboratory during this period, the number of examinations from each county being as follows:

Adair	88	Floyd	126	Monona	69
Adams	9	Franklin	77	Monroe	150
Allamakee	54	Fremont	54	Montgomery	114
Appanoose	366	Greene	68	Muscatine	552
Audubon	99	Grundy	27	O'Brien	160
Benton	262	Guthrie	21	Osceola	16
Black Hawk	1,529	Hamilton	63	Page	738
Boone	369	Hancock	41	Palo Alto	66
Bremer	119	Hardin	120	Plymouth	243
Buchanan	773	Harrison	30	Pocahontas	126
Buena Vista	187	Henry	106	Polk	22,082
Butler	22	Howard	18	Pottawattamie	681
Calhoun	519	Humboldt	9	Poweshiek	115
Carroll	478	Ida	132	Ringgold	5
Cass	178	Iowa	147	Sac	100
Cedar	65	Jackson	108	Scott	3,920
Cerro Gordo	641	Jasper	391	Shelby	97
Cherokee	83	Jefferson	99	Sioux	59
Chickasaw	127	Johnson	16,188	Story	402
Clarke	180	Jones	717	Tama	43
Clay	126	Keokuk	42	Taylor	36
Clayton	13	Kossuth	90	Union	157
Clinton	901	Lee	2,873	Van Buren	3
Crawford	67	Linn	2,782	Wapello	953
Dallas	343	Louisa	39	Warren	19
Davis	19	Lucas	92	Washington	86
Decatur	83	Lyon	38	Wayne	39
Delaware	27	Madison	6	Webster	720
Des Moines	458	Mahaska	180	Winnebago	102
Dickinson	124	Marion	492	Winneshiek	133
Dubuque	653	Marshall	541	Woodbury	2,486
Emmet	81	Mills	54	Worth	40
Fayette	560	Mitchell	41	Wright	180

35 Specimens sent in no name attached.

The physicians of the State reported to the Secretary of the State Health Department 2,667 cases of syphilis, 4,487 cases of gonorrhea and 61 cases of chancroid.

Dr. Throckmorton gave 694 lectures, reaching 101,375 women and girls in 218 cities and towns in the State.

The total number of pamphlets distributed in response to requests from individuals, schools, lecturers and field workers was 18,587, and 18,560 were distributed at State and County Fairs.

Mr. Gamel, the part time lecturer for boys gave 94 lectures reaching 2,410 boys and men.

The Venereal Disease slides and charts were shown 20 days during the months of August and September at the State and County Fairs with approximately 108,300 persons viewing the exhibit. There were 119 film showings made, with an attendance of 30,460.

There were 271 persons reported to this office as sources of infection by the physicians of the State, 113 were apprehended and placed under treatment. There were 65 cases referred to this Department from other States, 35 being apprehended and placed under treatment.

At the request of this Bureau, the American Social Hygiene Association sent a Federal Agent who made a thorough survey of the social conditions in several of the larger cities and towns.

REPORT OF THE HOUSING DEPARTMENT

EDWIN H. SANDS, Commissioner

The Biennial period July 1, 1922, June 30, 1924, has witnessed the greatest continuous program of residential building known in the history of the State. During the time of the war, comparatively no residential building was accomplished. This inactivity continued during 1920 largely due to the unsettled conditions and the excessive high costs in material and labor. These years of comparative inactivity produced a serious congestion in living conditions, causing many a house which would have otherwise been condemned, to remain occupied and making necessary the permitting of serious over-crowding of families in others.

Residential building activities began slowly in 1921, gaining a headway which reached its high mark in 1922 and has continued with little change to the present time. During the first half of this biennial period, (July 1, 1922, June 30, 1923) 4,143 permits were issued for NEW residential construction in the fifteen cities where the State Housing Law is mandatory. These were divided as follows: Single family 4,040, two family 48, multiple, 55; and represented an approximate valuation of $20,918,200. The results of this activity were immediately noticeable in the relief of congested living conditions and in the emptying of many houses which were immediately condemned for dwelling purposes.

The residenital building activity has continued through the 2nd half of the biennium (July 1, 1923, June 30, 1924), during which period 4,478 permits were issued for NEW residential construction which were divided as follows: 4,361 single family, 60 2-family, and 57 multiples; having an approximate valuation of $19,882,400.

This gives a total of NEW residential construction during the biennial period of 8,621 of which 8,401 were for single family construction, 104 for 2-family construction, and 112 for multiple construction, representing an approximate valuation of $40,800,600.

During this same period a large amount of remodeling and otherwise improving of residential property has taken place as witnessed by the following: from July 1, 1922 to June 30, 1923, 2,578 permits were issued for remodeling at an approximate valuation of $1,837,175, while 3,744 permits were issued for minor residential construction, mostly garages, representing an approximate valuation of $999,275. This gives for the first half of the biennium a total of 10,465 permits for residential construction and improvement at an approximate valuation of $23,754,600.

From July 1, 1923 to June 30, 1924, 3,010 permits were issued for remodeling at an approximate valuation of $1,871,600, while 4,008 permits were issued for minor residential construction at an approximate value of $1,061,450 making a total of 11,496 permits for residential construction and improvements—this half of the biennium at an approximate valuation of $22,815,450.

This gives a grand total for the biennial period of 21,961 permits for all residential work in the 15 cities where the law is mandatory, having an approximate valuation of $46,570,000.

Naturally, with such an extensive building program, appeals to the State Department have been frequent, averaging for the entire period better than 53 a month, many of which compelled personal inspection before they could be properly adjusted. This together with assistance given to the local commissioners, especially in connection with the inspection of tenement and Flat building, has kept the department busy.

The Housing Law has clearly justified itself during this period of activity and in spite of the many difficult situations which have developed, has won an almost universal support, especially has this been true, as the people come better to understand fairly what its requirements are. To this end, the State Department has welcomed and availed itself of every opportunity to address conventions, civic clubs, and other local organizations upon some one or several of the problems involved in Housing regulations. This publicity has reached far beyond the city problem. Frequent appeals have come to the State Department from cities of less than 15,000 and even from towns and villages. Especially has the health conditions surrounding school houses in the State been called to our attention and pleas made for relief. A little over a year ago this matter was presented to the State Board of Health and after discussion was referred to a committee to draft Rules and Regulations covering same. Many things have intervened, to date, but we hope to have this work accomplished in the near future and relief afforded to all bad housing conditions wherever they may be found within the State.

MINING CAMPS

Another phase of the Housing Law is that which makes certain application to the health conditions in the mining camps of the State. This is a peculiar and difficult work owing to the more or less temporary life of the camps and to the type of people who largely occupy them. Progress is necessarily slow, yet much has been accomplished. We have had the hearty co-operation of both the coal operator and the miner's organization which has resulted in many improvements of conditions in the old camps and in the construction of two new camps where the general housing and living conditions far excel anything known in Iowa mining camps history heretofore. One of these new camps, Buxton No. 20, is the largest camp in the State. In this camp every house has a solid foundation under it; the building is of first class construction; all toilets are built over cemented pits and the source of the camp water supply has been safeguarded.

PLUMBING

The work under the State Plumbing Code was turned over to the Housing Department during the early part of this Biennium. Most of the work involved has been handled through correspondence although personal assistance has been given in a few cases, especially in certain prosecution of plumbers who were not complying with the law. The present Plumbing Code has proved to be very inadequate for the purpose intended, but revision could not be had except upon legislative authorization. This authority was secured during the past winter from the Code Revision Session of the legislature and provision is now in the law for the immediate revision of the present Code and for a Biennial Revision hereafter, if deemed necessary. It is hoped that a new and adequate Plumbing Code will be ready for distribution soon after the first of the year 1925 and, with it, many of the present difficulties will be eliminated.

MATTRESS FACTORY INSPECTION

The 40th General Session of the State Legislature passed a Mattress Law providing, among other things, for the inspection of mattress factories and named the Board of Health for its enforcement. No inspector or funds were provided however. This made it a difficult matter to handle properly. Several factories wrote in for their license numbers which were given them by mail. The latter part of May, this year, the Housing Department was asked to give temporary attention to the inspection of factories in cities where our housing work called us and which work could be done in connection with the regular work of the department. This has been done and to date five factories have been inspected and nine given license numbers.

The 40th Special Session for Code Revision placed the enforcement of this Mattress Law with the State Department of Agriculture and they will take over this work sometime this fall.

BUREAU OF PUBLIC HEALTH NURSING

Public sentiment in favor of public health nursing is growing. A survey of nursing in Iowa shows that more governmental groups; such as, boards of education and county boards of supervisors are contributing wholly or in part to the maintenance of nursing services than ever before. In 1922, 63 nurses were supported wholly by public funds and in 1924, 82, showing an increase of approximately 30 per cent. In addition to this, public funds make partial contribution to the support of 17 nurses. Nursing organizations are making greater efforts to meet their responsibility to the community by raising the standard of work and the qualifications of nurses.

There has been a tendency toward the separation of public health nursing services from family social work and in those cities in which the nursing work has thus been distinguished from service generally regarded by the lay public as primarily of a relief nature, it is felt that

the change has afforded the nursing association a broader opportunity for usefulness through prevention and education. Sioux City Visiting Nurse Association and the Cedar Rapids Public Health Nursing Association are proving the soundness of this plan by the advances they have made since their reorganization. Similar plans are pending in other communities.

We are further encouraged by the attitude of indidual public health nurses toward professional improvement. At least one-fourth of the nurses have taken post graduate work, either the regular course of one year, or a summer course of six weeks, and many others have attended institutes, conferences, state and national meetings or have visited services similar to theirs in other localities for suggestions which might improve their own work. This effort toward improvement is reflected in greater efficiency on the part of nurses. Their efficiency may be judged by the promptness in responding to communications to the Bureau and their regularity in making reports.

Red Cross Nursing Activities Committees, Public Health Nursing and Visiting Nursing Associations, County Boards of Supervisors, Boards of Education and Superintendents of Schools have found the Bureau useful in supplying their needs for qualified nurses. They have also rendered the Bureau service by referring to the Bureau applicants which come to their attention, both in order that their experience and credentials might be passed upon, and in order that the Bureau might have their names as prospects for positions. Many letters of appreciation received from these employment groups testify to the value of the service rendered by the Bureau.

Appended is the tabulation of public health nurses employed in the State in various groups. A decrease in the totals is the natural falling off to be expected among nurses employed by the Red Cross with funds raised during the war. This decrease, however, is not nearly as rapid as was anticipated. During the war when the Red Cross Chapters greatly expanded, every Nursing Activities Committee was encouraged to employ a public health nurse, partly as a war-time service, and with the surplus of funds raised at that time these nurses have continued over as long as the original funds were available. That, in times of peace, considering the natural reaction and the economic depression, so great a number of these chapters have retained their nursing service, is the most gratifying tribute to the efficiency of that service and to the permanent place it has made for itself in the public mind.

	1922	1923	1924
County Nurses	72	37	30
Visiting Nurses	54	52	56
Health Center Nurses	5	7	9
City School Nurses	63	71	72
Student Health Nurses	3	3	3
Industrial Nurses	4	7	7
Field Nurses	6	10	12
	207	187	189

I wish to acknowledge some special groups that have been particularly helpful in promoting public health nursing and in helping to raise the standard of service given and the qualifications of the nurses employed. Among these are the various Farm Bureau Women's Organizations; the Iowa Federation of Women's Clubs, its district, county and local units; the Iowa State Teachers Association, the Iowa State Association of Registered Nurses; the Iowa Branch of Parents and Teachers Association; the Iowa League of Women Voters; the Extension Divisions at Ames and Iowa City; and the Division of Infant and Maternity Hygiene. This last group has been especially helpful in encouraging the employment of qualified public health nurses in every community in Iowa.

I wish to mention especially the work of the American Red Cross through its field directors in the work they have done in maintaining services throughout the State and their zeal in upholding standards of public health nursing.

Last, but not least, I want to speak of the work of the Iowa Tuberculosis Association which has been invaluable because it has made the Bureau possible through providing the salary of the Director, office and secretarial assistance for the Director, as well as an assured welcome in every part of the State because of its favorable relations with every group interested in educational and health work throughout Iowa.

Also, I want to acknowledge the co-operation of each department of the State Board of Health, mentioning especially the following departments: Venereal Disease, Housing, Sanitary Engineering, Vital Statistics, and Nurses Examinations, but must especially express my appreciation of the sympathetic co-operation and understanding of the Secretary, Dr. Rodney Fagen and of Mr. Lynn Clemens and Mr. Henry Grefe.

While at the Biennial Nurses Convention in Detroit this summer, I attended a dinner of Directors of Public Health Nursing Departments in State Boards of Health. Each Director gave briefly something of the history of the development of her department and its relations with other departments and I returned to Iowa convinced that, there is none in the country which has more favorable relations with departments of the State Board of Health and other organizations in the State than this one.

New cases aided during biennial:		Homes Visited:
Prenatal	1,297	2,576
Postnatal	987	12,084
Infancy	6,723	10,059
Pre-School	4,480	5,332
Tuberculosis	3,329	3,969
Surgical	805	5,047
Medical	3,528	20,862
City Schools:		County Schools:
Serving hot lunches	396	2,650
Nutrition Classes	2,014	220
Visited	3,439	6,778
Rooms Inspected	11,426	13,676

Class Room Talks	6,715	9,456
Talks to Parents	1,340	1,566
Other Groups	411	879
Pupils Examined	81,592	142,696
No Defects	40,299	87,930
Defects Corrected	14,094	30,721
Weight 7% under	10,028	23,632
10% under	8,098	10,687
20% over	2,571	4,275
Eyes	1,657	4,733
Vision	4,322	15,636
Ears	538	1,989
Hearing	935	2,270
Teeth	24,851	52,208
Nasal Breathing	5,758	14,732
Tonsils and Throat	12,592	33,409
Glands	3,389	12,636
Scalp and Hair	484	772
Skin	1,157	2,985
Orthopedic	329	577
Posture	2,850	7,321
Systemic Symptoms of	185	582
Mental Symptons of	256	411
No. Pupils Having:		
Diphtheria	385	377
Scarlet Fever	594	827
Smallpox	113	266
Septic Sore Throat	1,476	217
Mumps	1,190	778
Measles	2,251	1,627
Whooping Cough	569	598
Chickenpox	1,556	737
Vaccinated	1,465	2,638
Scabies	784	670
Pediculosis	624	302
Impetigo	979	620
Other	366	293
Cultures Taken	2,245	5,936
Excluded	5,026	2,742
Notices to Parents	24,503	50,377
Referred to Physician	11,602	25,404
Referred to Dentist	18,003	30,130
New Perkins cases	346	470

REGISTRATION OF VITAL STATISTICS

The PURPOSE of this department is to provide for the immediate registration of all births and deaths, by means of certificates of births and deaths, and burial or removal permits, to require prompt returns to the Capitol of the State, to insure thorough organization and efficiency of the registration of Vital Statistics throughout the State.

The AIM of this department is to secure the exact records of the important facts concerning the birth and death of each citizen or resident of the State of Iowa, and from such records to make card indices and classified tabulation so that the information secured may be available on inquiry and permanently kept for possible future use.

The POLICY of this department from time to time is to issue to the people of the State statistics which will show the State's growth and mark the flood and ebb of physical life; to indicate to number and distribution of the producers and consumers of wealth; to measure the people's health and to show the hygienic conditions of the environment; to forewarn them of an impending epidemic that they may take measures to check its ravages so that they might live and enjoy the prosperity which this state of Iowa offers them.

REGISTRATION OF VITAL STATISTICS IN IOWA—1922 AND 1923

The years of 1922 and 1923 for the Division of Vital Statistics in this state were the banner years in accomplishing the mission of this division.

In the year of 1921 the state awakened to its responsibilities and the Model Registration Law was passed by the Thirty-Ninth General Assembly, this Law taking effect July 4, 1921.

One year after the establishment of this law, August, 1922, a request was made to the Department of Commerce, Bureau of the Census, for a representative of that Bureau to come to Iowa to make a test with the view of admitting Iowa into the Registration Area of the United States on deaths. The result was satisfying and the State was admitted for the year of 1923. In September of 1923 a like request was made to the Bureau of the Census and a representative checked the state for admittance to the Registration Area on births. Again the result was most gratifying and Iowa was admitted into the Registration Area of the United States for births for the year of 1924.

By thus being admitted into the Registration Area for births and deaths the Division of Vital Statistics is allowed a franking privilege by the United States Government. This entitles us to make inquiries for corrections and additional information which is often lacking from the birth and death certificates. By this courtesy we save the State of Iowa a large postage bill which otherwise would have to be paid by the state.

We are also permitted to furnish to each parent a certificate or Notification of Birth Registration without cost to the state. These forms and franked envelopes for mailing are furnished by the courtesy of the Bureau of the Census of the United States Government.

NOTIFICATION OF BIRTH REGISTRATION FURNISHED TO PARENT

UNITED STATES OF AMERICA

DEPARTMENT OF COMMERCE

BUREAU OF THE CENSUS

NOTIFICATION OF BIRTH REGISTRATION

This is to advise you that there is preserved under File No.....in the State office for the registration of vital statistics at Des Moines, Iowa, a Record of Birth, as follows:

Name ..... Sex .....

Born on....., 192..., at.....

Name of father .....

Maiden name of mother .....

(Seal)

RODNEY P. FAGEN, M. D.,
Secretary, Iowa State Department of Health.
W. M. STEWART,
Director of the Census

REVERSE SIDE OF CERTIFICATE

This certificate should be carefully preserved as a record which in future years may prove to be valuable evidence regarding the birth of your child. For example, the certificate may establish the right of your child to inherit property, to go to school, and to work.

NOTICE

If any errors are found in the statements given on the inclosed certificate, kindly send corrections at once to

DR. RODNEY P. FAGEN,
Secretary, State Department of Health,
Des Moines, Iowa.

Dr. Rodney P. Fagen, as Secretary of the State Department of Health, will then correct the official record on file, and as Special Agent of the Bureau of the Census will send to Washington, D. C., any correction of statistical importance.

SUMMARY OF PROVISIONAL BIRTH AND MORTALITY FIGURES—1923

(By the Department of Commerce for Registration Area)

Washington, D. C.—The Department of Commerce announces that birth rates for 1923 were lower than for 1922 in 21 of the 27 states for which figures for the two years are shown in the following summary. The highest 1923 birth rate (34.8 per 1,000 population) is shown for cities of Wyoming and the lowest (15.6) is for rural districts of Montana.

Death rates for 1923 were slightly higher than for 1922 in 25 of the 36 states shown for both years. Three states, Connecticut, New York, and North Carolina, have the same rates for 1923 as for 1922 and eight states, Colorado, Idaho, Montana, Nebraska, Oregon, South Carolina, Utah, and Washington, have lower rates in 1923. The highest 1923 death rate (20.3 per 1.000 population) is shown for cities of Mississippi and the lowest (6.3) for the rural districts of Idaho.

Infant mortality rates for 1923 are generally higher than those for 1922, as 17 of the 27 states show higher rates in 1923. The highest 1923 infant mortality rate (117) appears for cities of South Carolina and the lowest (51) for the rural districts of Utah and the cities of Washington. Infant mortality rates are shown for both years for 45 cities of 100,000 population or more in 1920. For 25 of these cities the 1923 infant mortality rates are lower than those of the previous year. The highest 1923 rate (110) is for Richmond and the lowest (48) for Spokane.

SUMMARY OF DEATHS FOR IOWA—1922 AND 1923

The death rate in the State of Iowa for 1923 was 10.2 per 1,000 population as compared with 9.9 for the year of 1922. The deaths reported for the year 1923 shows the urban rate to be 12.9 while the rural districts have a rate of 9.3.

The bordering states of Iowa have a general death rate as follows: Minnesota 10.1, Nebraska 9.3, Illinois 12.0, Wisconsin 10.7, for 1923. These four states are also in the Registration Area for deaths. South Dakota which also borders Iowa is not in the Registration Area and statistics for this state are not available.

Johnson County with a rate of 19.6 per 1,000 population reported the highest death rate. Keokuk County being next in order with a rate of 16.4. O'Brien County with a rate of 4.0 was the lowest rate reported. (Johnson County's death rate is due to the Iowa State University Hospital being located at Iowa City. Patients from all corners of the state take advantage of the Medical Clinic offered by the State Institution).

Out of 25,236 deaths 2,944 occurred in children under one year of age. The age period from 70 to 79 was the greatest having 4,931 deaths. Next in order was the period from 60 to 69 years with 3,995 deaths.

The greatest number of deaths during 1923 occurred in the male (13,617) or 1,198 more than the female deaths which were 11,619. For the year of 1922 the male deaths exceeded the female by 1,537 (Male deaths, 12,801), (Female, 11,264). In 1923 there were 10,622 married persons died followed by 7,727 single persons. Next in order was the

widowed having 6,486. Out of the 25,236 deaths for 1923 there were 295 colored deaths.

The eight diseases causing the greatest number of deaths in 1923 were Pneumonia (all forms) 2,416, Cancer 2,367, Cerebral Hemorrhage 2,139, Diseases of the Heart 1,614, Nephritis and Bright's Disease 1,330, Influenza 1,318, Senility 1,088 and Tuberculosis 1,074. For 1922 they were Pneumonia 2,320, Cancer 2,147, Cerebral Hemorrhage 1,961, Nephritis and Bright's Disease 1,570, Diseases of the Heart 1,442, Malformations 1,093, Tuberculosis 1,066 and Senility 900.

NUMBER OF DEATHS WITH RATE (PER 1,000 POPULATION) FOR THE YEARS 1922-1923

(Cities included within the Counties)

Counties	Number of Deaths		Death Rate	
	1922	1923	1922	1923
Adair	99	117	7.0	8.2
Adams	72	86	6.9	8.1
Allamakee	147	173	8.5	10.0
Appanoose	384	316	12.4	10.2
Audubon	100	105	8.0	8.3
Benton	216	214	9.3	8.8
Black Hawk	521	572	8.8	9.5
Boone	306	310	10.1	10.1
Bremer	150	212	8.9	12.5
Buchanan	308	302	15.5	15.1
Buena Vista	146	164	7.4	8.5
Butler	146	164	8.1	9.1
Calhoun	143	158	8.0	8.8
Carroll	234	226	10.7	10.3
Cass	187	208	9.6	10.6
Cedar	147	149	8.4	8.5
Cerro Gordo	354	376	9.6	9.9
Cherokee	223	272	12.4	15.1
Chickasaw	125	178	8.1	11.5
Clarke	107	111	8.2	10.6
Clay	119	117	6.7	7.1
Clayton	194	232	7.6	9.3
Clinton	507	488	11.8	11.3
Crawford	181	173	8.7	8.3
Dallas	121	247	4.8	9.7
Davis	109	110	8.9	8.9
Decatur	189	170	11.4	10.2
Delaware	163	175	9.0	9.6
Des Moines	480	502	13.6	14.1
Dickinson	76	84	7.1	7.7
Dubuque	630	718	10.8	12.2
Emmet	114	99	8.7	7.1
Fayette	254	277	8.6	9.3
Floyd	173	172	9.0	8.9
Franklin	143	150	8.9	9.8
Fremont	134	133	8.7	8.6
Greene	142	160	8.6	9.6
Grundy	95	105	6.5	7.2
Guthrie	174	164	9.9	9.3
Hamilton	159	181	8.2	9.2
Hancock	109	109	7.2	7.1
Hardin	215	236	9.0	9.8
Harrison				
Henry				
Howard	119	120	7.9	8.0
Humboldt	85	99	6.5	7.5
Ida	93	92	7.9	7.8
Iowa	168	182	9.0	9.8

NUMBER OF DEATHS—Continued

Counties	Number of Deaths		Death Rate	
	1922	1923	1922	1923
Jackson	222	221	11.3	11.1
Jasper	285	270	10.2	9.3
Jefferson	164	199	9.9	12.0
Johnson	499	520	19.5	19.3
Jones	193	179	10.6	9.6
Keokuk	208	214	9.9	10.4
Kossuth	203	177	7.9	6.8
Lee	526	565	13.0	13.8
Linn	744	814	9.9	10.6
Louisa	128	139	10.7	11.4
Lucas	131	140	8.1	8.7
Lyon	110	99	7.0	6.3
Madison	153	123	10.3	8.2
Mahaska	282	289	11.0	11.0
Marion	306	265	12.0	10.4
Marshall	363	386	10.1	11.6
Mills	158	148	10.3	9.6
Mitchell	130	152	9.3	10.8
Monona	144	127	8.4	7.4
Monroe	242	234	10.5	10.0
Montgomery	161	197	10.6	11.4
Muscatine	352	358	12.1	12.3
O'Brien	164	78	8.5	4.0
Osceola	88	77	8.4	7.3
Page	354	377	14.5	15.6
Palo Alto	105	109	6.6	6.9
Plymouth	204	171	8.8	7.2
Pocahontas	108	120	6.9	7.6
Polk	1,753	1,823	10.8	10.9
Pottawattamie	644	656	10.3	10.3
Poweshiek	179	152	9.0	7.6
Ringgold	109	102	8.5	7.9
Sac	151	142	8.5	8.0
Scott	835	909	10.9	12.1
Shelby	143	128	9.0	8.0
Sioux	168	178	6.3	6.9
Story	148	235	5.6	8.8
Tama	197	220	9.0	10.2
Taylor	127	178	8.3	11.5
Union	157	184	9.0	10.5
Van Buren	148	157	10.7	11.2
Wapello	487	546	12.8	12.9
Warren	173	176	9.6	9.8
Washington	213	182	9.9	8.9
Wayne	143	141	9.4	9.2
Webster	400	404	10.5	11.0
Winnebago	123	102	8.9	7.3
Winneshiek	224	212	10.1	9.6
Woodbury	1,046	1,023	10.8	10.2
Worth	73	98	6.1	8.1
Wright	146	161	7.0	7.7
State	24,065	25,236	9.9	10.2

NUMBER OF DEATHS WITH RATE (PER 1,000 POPULATION) FOR THE YEARS 1922-1923

(In Cities for which mortality returns are kept separate)

Cities	Number of Deaths		Death Rates	
	1922	1923	1922	1923
Boone City	*	176	*	13.4
Burlington	377	394	15.6	16.3
Cedar Rapids	506	555	12.5	11.5
Clinton	357	351	14.7	14.5
Council Bluffs	447	462	11.9	12.1
Davenport	703	750	11.8	12.9
Des Moines	1,542	1,596	11.4	11.5
Dubuque	530	588	13.4	14.9
Fort Dodge	249	275	12.3	13.4
Fort Madison	168	178	13.2	13.7
Iowa City	*	308	*	†26.6
Keokuk	247	272	17.0	18.5
Marshalltown	250	254	15.6	15.4
Mason City	242	266	11.0	11.5
Muscatine	221	244	13.7	15.2
Ottumwa	355	424	15.3	15.5
Sioux City	880	862	11.5	11.0
Waterloo	366	389	9.7	10.0

*Figures for Boone City and Iowa City not kept separate for year 1922.
†Iowa State University and Clinic located here.

DEATHS REPORTED BY AGE GROUPS AND CONJUGAL CONDITION FOR YEARS, 1922-1923

1922		1923	
Male	12,801	Male	13,617
Female	11,264	Female	11,619
Total	24,065	Total	25,236
Under one year	2,920	Under one year	2,944
1 to 5 years	1,056	1 to 2 years	730
5 to 10 years	564	3 to 4 years	284
10 to 20 years	956	5 to 9 years	511
20 to 30 years	1,222	10 to 14 years	392
30 to 40 years	1,540	15 to 19 years	453
40 to 50 years	1,953	20 to 24 years	575
50 to 60 years	2,779	25 to 29 years	637
60 to 70 years	3,987	30 to 34 years	593
70 to 80 years	4,216	35 to 39 years	749
80 to 90 years	2,471	40 to 44 years	803
90 years and over	369	45 to 49 years	973
Unknown	32	50 to 59 years	2,615
		60 to 69 years	3,995
		70 to 79 years	4,931
		80 to 89 years	3,441
		90 to 99 years	581
		100 years	14
		Unknown	15
		Single	7,727
		Married	10,622
		Widowed	6,486
		Divorced	289
		Unknown	112
White	23,834	White	24,941
Colored	231	Colored	295

DEATHS FROM ALL CAUSES FOR YEARS 1922 AND 1923

CAUSES OF DEATHS	Year 1922	1923
ACUTE INFECTIONS		
Typhoid Fever	83	74
Malarial Fever	3	5
Smallpox	20	5
Measles	13	111
Scarlet Fever	141	132
Whooping Cough	42	144
Diphtheria and Croup	282	233
Influenza	642	1,318
Erysipelas	84	66
Septicaemia	291	241
Pellagra	3	2
Tetanus	35	24
Tuberculosis of lungs	917	888
Tuberculosis meningitis	29	50
Other forms of Tuberculosis	120	136
Venereal diseases	92	99
Dysentery	0	2
Chickenpox	0	1
Anthrax	0	1
Rabies	0	3
Mycosis	0	1
CONSTITUTIONAL		
Cancer and other malignant tumors	2,147	2,367
Rheumatism	167	134
Diabetes	427	373
Exophthalmic goitre	56	62
Leuchaemia	40	52
Anaemia	327	342
Alcoholism	59	65
Chronic occupation poisonings	40	5
Other general diseases	0	9
CENTRAL NERVOUS SYSTEM		
Encephalitis	87	95
Simple meningitis	196	124
Locomotor ataxia	33	33
Acute anterior poliomyelitis	21	7
Cerebral hemorrhage	1,961	2,139
Paralysis	460	179
Insanity	124	192
Epilepsy	86	109
Convulsions	107	74
Neuralgia	114	21
Diseases of the ears	57	73
Cholera	0	6
Other disease of the nervous system	0	41
Diseases of the eye	0	1
Poliomyelitis	0	86
CIRCULATORY		
Acute endocarditis	212	202
Diseases of the heart	1,442	1,614
Angina pectoris	308	274
Diseases of the arteries	720	754
Embolism-Thrombosis	165	174
Hemorrhage	168	4
RESPIRATORY		
Diseases of larynx	0	13
Diseases of thyroid	0	6
Bronchitis	262	236
Broncho-pneumonia	572	657
Pneumonia	1,748	1,759
Pulmonary congestion	47	180
Asthma	86	56
Septic throat	85	67
DIGESTIVE		
Ulcers of stomach	164	131
Diarrhoea, enteritis (Under two years)	225	262
Diarrhoea, enteritis (two years and over)	276	282
Appendictis, typhilitis	334	386
Hernia	366	92
Cirrhosis of liver	143	114

CAUSES OF DEATHS—Continued	Year 1922	1923
Gall stones	220	204
Peritonitis	97	98
Obstruction of bowels	0	321
Diseases of liver	0	6
GENITO URINARY		
Nephritis, Bright's disease	1,570	1,330
Other diseases of kidneys	56	379
Diseases of prostate	169	182
Non-cancerous tumors of female organs	95	125
Puerperal septicaemia	47	40
Other puerperal diseases	209	206
Gangrene	121	113
Diseases of bones and organs of locomotion	3	4
Furuncle	0	4
Abscesses	0	15
Diseases of skin and annexa	0	6
BIRTHS		
Malformations	1,093	941
Premature births	894	784
ACCIDENTAL		
Suicide (Means not kept separate, 1922)	122	325
Gas		14
Firearms		124
Cutting		6
Hanging		104
Poison		72
Drowning		5
Poisoning by food	104	17
Other acute poisonings	5	28
Burns	115	127
Asphyxiation	65	82
Accidental drowning	128	103
Traumatism by firearms	162	46
Traumatism by cutting	49	3
Traumatism by fall	92	116
Traumatism by crushing in mines	25	25
Traumatism by machines	5	38
Railroad accidents	137	146
Street car accidents	5	16
Automobile accidents	187	229
Injuries by other vehicles	18	12
Injuries by animals	51	42
Excessive cold	2	4
Effects of heat	10	17
Other external violence	53	80
Lightning	8	15
Electricity	19	23
Fractures	247	143
Starvation	0	2
Homicide	0	36
Firearms	0	31
Cutting	0	2
Other means	0	3
Senility	900	1,088
Deaths from all other causes	392	300

SUMMARY OF RATES FOR DIPHTHERIA, MEASLES AND TYPHOID FEVER IN THE STATE OF IOWA FOR YEARS 1922 AND 1923

DIPHTHERIA

COUNTIES—The death rate per 100,000 population in the State of Iowa for the year of 1923 was 9.8 compared with 11.6 for 1922 or a decrease of 1.8. The three counties showing the highest rate for 1922 were: Monroe (52.2), Clarke (47.8), Clinton (44.9). Those with the highest rate for 1923 were: Pocahontas (56.8), Appanoose (41.8) and Jackson (35.0).

CITIES—The three cities with the highest rate for 1922 were: Mason City (55.0), Clinton City (47.0) and Fort Dodge (37.9). For 1923 they were: Davenport (24.1), Mason City (21.7) and Burlington (20.8).

MEASLES

COUNTIES—The death rate per 100,000 population for 1922 was (.5). For 1923 the rate was (4.8) or an increase over 1922 of (4.3). The three counties showing the highest rates for this disease in 1922 were: Howard (7.2), Mills (6.6) and Franklin (6.2). For 1923 Allamakee was highest with (29.0), Jones was second (26.8) and Wapello County third with (26.1).

CITIES—The three cities with the highest rate for 1922 were: Council Bluffs (5.3), Cedar Rapids (2.1) and Des Moines (.74). For 1923 Sioux City was highest with (110.2) followed by Ottumwa (36.6). Next in order was Muscatine (18.7).

TYPHOID FEVER

COUNTIES—The death rate per 100,000 population in the State of Iowa for the year of 1922 was 3.4 compared with 3.1 for the year of 1923 which shows a decline of .3 over the year 1922. The three counties having the highest rates for 1922 were: Emmet (22.8), Benton (21.4), Chickasaw (19.5). For the year of 1923 the county showing highest rate was Jefferson with 18.1 or 1.4 lower than the third highest county in 1922. The second highest county for 1923 was Lee (14.7) followed by Van Buren with (14.0).

CITIES—The three cities showing the highest rates for 1922 were: Waterloo (23.6), Ottumwa (12.9) and Council Bluffs (10.7). For 1923 they were Keokuk City (20.6), Fort Madison (15.4) and Ottumwa (7.3).

DEATH RATE (PER 100,000 POPULATION) FOR DIPHTHERIA, MEASLES AND TYPHOID FEVER FOR THE YEARS OF 1922 AND 1923, BY COUNTIES

Cities included within Counties

Counties	Diphtheria Rate		Measles Rate		Typhoid Fever Rate	
	1922	1923	1922	1923	1922	1923
Adair	0	0	0	0	7.0	7.0
Adams	0	0	0	9.5	0	0
Allamakee	0	0	0	29.0	0	5.8
Appanoose	22.6	41.8	0	25.7	9.7	6.4
Audubon	16.0	8.0	0	0	0	0
Benton	17.2	0	0	4.1	21.4	0
Black Hawk	3.4	3.3	0	10.0	17.0	5.0
Boone	16.5	0	0	0	6.6	0
Bremer	0	5.9	0	5.9	11.8	5.9
Buchanan	10.0	15.0	0	10.0	0	0
Buena Vista	5.2	0	5.2	10.3	5.2	5.2
Butler	0	0	0	11.1	5.5	0
Calhoun	0	0	0	0	0	0
Carroll	13.7	0	0	0	0	0
Cass	5.1	20.5	0	0	5.1	0
Cedar	11.4	11.4	0	0	0	0
Cerro Gordo	35.7	15.8	0	0	0	0
Cherokee	5.5	0	0	0	5.5	11.1
Chickasaw	19.5	19.4	0	11.1	19.5	0
Clarke	47.8	0	0	0	0	0
Clay	6.2	0	0	6.0	6.2	0
Clayton	0	0	0	4.0	0	0
Clinton	44.9	11.5	0	0	2.2	4.6
Crawford	4.8	4.7	0	0	0	9.6
Dallas	0	7.8	0	0	0	3.9
Davis	24.4	0	0	0	0	8.0
Decatur	18.0	12.0	0	0	0	0
Delaware	0	0	5.5	21.9	0	5.5
Des Moines	25.4	14.1	0	11.3	0	0
Dickinson	0	9.2	0	9.2	0	9.2
Dubuque	8.5	8.5	0	13.6	3.4	0
Emmet	7.6	0	0	0	22.8	0
Fayette	0	13.6	0	6.7	0	13.5
Floyd	10.4	10.3	0	0	0	0
Franklin	0	6.2	0	6.2	6.2	0
Fremont	32.4	32.4	0	0	0	0
Greene	6.0	6.0	0	0	6.0	0
Grundy	6.8	0	0	0	0	6.8
Guthrie	5.7	5.7	0	0	11.3	0
Hamilton	6.1	5.1	0	0	0	0
Hancock	33.0	6.5	0	0	0	0
Hardin	0	0	0	0	0	4.2
Harrison	16.1	13.5	0	13.5	0	0
Henry	16.2	8.5	0	0	0	5.5
Howard	0	7.2	0	0	7.2	0

DEATH RATE FOR DIPHTHERIA, MEASLES AND TYPHOID FEVER—Continued

Counties	Diphtheria Rate		Measles Rate		Typhoid Fever Rate	
	1922	1923	1922	1923	1922	1923
Humboldt	0	0	0	0	0	7.6
Ida	0	8.4	0	0	8.5	0
Iowa	0	10.7	0	0	0	0
Jackson	5.1	35.0	0	0	5.1	0
Jasper	14.3	3.4	0	0	0	0
Jefferson	5.7	6.0	0	0	0	18.1
Johnson	3.8	29.8	0	0	3.8	3.7
Jones	0	5.4	0	26.8	5.4	0
Keokuk	9.6	15.4	0	0	0	0
Kossuth	7.8	0	0	0	0	3.8
Lee	2.5	12.3	0	0	7.5	14.7
Linn	1.3	11.7	1.3	0	4.0	0
Louisa	0	16.4	0	0	0	8.2
Lucas	0	12.4	0	12.4	0	6.2
Lyon	0	12.8	0	0	0	0
Madison	13.4	6.7	0	6.7	13.4	6.7
Mahaska	7.8	3.8	0	3.8	3.9	3.8
Marion	15.8	15.7	0	3.9	0	3.9
Marshall	3.0	3.0	0	0	3.0	3.0
Mills	0	0	6.5	5.5	0	6.5
Mitchell	0	0	0	0	14.3	0
Monona	11.6	11.3	0	0	0	0
Monroe	52.2	21.3	0	4.3	4.3	12.8
Montgomery	0	5.8	0	0	0	5.8
Muscatine	6.9	3.4	0	10.3	0	0
O'Brien	6.1	0	0	5.1	0	0
Osceola	0	0	0	0	0	0
Page	0	12.4	0	4.1	0	0
Palo Alto	6.3	6.3	0	0	0	0
Plymouth	4.2	8.4	0	4.2	0	8.4
Pocahontas	19.0	56.8	0	0	6.3	6.3
Polk	17.2	12.5	.6	3.0	1.8	.6
Pottawattamie	15.9	7.9	3.2	0	8.0	3.1
Poweshiek	0	5.0	0	5.0	5.0	5.0
Ringgold	0	7.7	0	0	0	0
Sac	11.3	11.2	5.7	5.6	0	0
Scott	24.8	22.6	0	14.6	3.9	1.3
Shelby	31.3	6.2	0	0	0	0
Sioux	11.2	0	0	3.7	3.7	0
Story	0	3.7	0	0	3.7	3.7
Tama	9.2	9.2	0	0	0	4.6
Taylor	6.5	0	0	0	4.6	12.9
Union	5.7	11.5	0	0	0	0
Van Buren	14.4	7.0	0	0	0	14.0
Wapello	15.8	9.5	0	26.1	7.9	4.7
Warren	5.5	11.1	0	0	0	5.5
Washington	19.5	0	0	0	4.9	0
Wayne	5.6	19.5	0	0	13.1	0
Webster	44.5	10.9	0	0	5.2	0
Winnebago	14.5	7.2	0	0	0	0
Winneshiek	0	4.5	0	4.5	4.5	0
Woodbury	17.5	14.9	1.3	7.9	0	7.9
Worth	8.4	8.3	0	0	0	0
Wright	4.8	9.5	0	0	0	0
The State	11.6	9.8	.5	4.8	3.4	3.1

DEATH RATE (PER 100,000 POPULATION) FOR DIPHTHERIA, MEASLES AND TYPHOID FEVER FOR THE YEARS OF 1922 AND 1923 FOR CITIES IN STATE

Cities	Diphtheria Rate		Measles Rate		Typhoid Fever Rate	
	1922	1923	1922	1923	1922	1923
Boone	*	0	*	0	*	0
Burlington	33.3	20.8	0	16.6	0	0
Cedar Rapids	2.1	16.6	2.1	0	6.4	0
Clinton	47.0	16.6	0	0	3.9	0
Council Bluffs	24.0	13.1	5.3	0	10.7	5.2
Davenport	30.3	24.1	0	17.2	3.4	1.7
Des Moines	17.8	13.0	.7	2.8	1.5	.7
Dubuque	10.2	7.6	0	17.8	5.1	0
Fort Dodge	39.9	9.8	0	0	5.0	0
Fort Madison	7.9	15.4	0	0	0	15.4
Iowa City	*	0	*	0	*	0
Keokuk	0	6.9	0	0	6.9	20.6
Marshalltown	6.2	0	0	0	6.2	0
Mason City	55.0	21.7	0	0	0	0
Muscatine	6.2	6.2	0	18.7	0	0
Ottumwa	17.2	11.0	0	36.6	12.9	7.3
Sioux City	19.9	19.2	0	110.2	0	5.1
Waterloo	2.6	5.1	0	12.8	23.6	0

*Figures for Boone City and Iowa City not kept separate for year 1922.

SUMMARY OF RATES FOR WHOOPING COUGH, TUBERCULOSIS IN THE STATE OF IOWA FOR YEARS 1922 AND 1923

WHOOPING COUGH

COUNTIES—The death rate per 100,000 population in the State of Iowa for the year of 1922 was 1.7 compared with the year of 1923 (6.1) or an increase of 4:4. The three counties with the highest rates for 1922 were: Dickinson (8.8), Wayne and Webster Counties tied for second with (13.1), Worth County third with rate of (8.4). For 1923 the County having the highest rate was Mills (32.4), Fayette next in order with (26.9) followed by Crawford with (24.3).

CITIES—The three cities with the highest rate for 1922 were: Fort Dodge (19.9), Keokuk (6.9) and Marshalltown (6.2). For 1923 they were: Marshalltown (24.3), Fort Dodge (19.2) and Muscatine (18.7).

TUBERCULOSIS (ALL FORMS)

COUNTIES—THE death rate per 100,000 population in the State of Iowa for the year of 1922 was 43.5 compared with 42.9 for the year of 1923 a decrease of .6 over 1922. The three counties with the highest rates for 1922 were: Mills (132.2), Buchanan (120.0) and Henry (118.0). For 1923 they were: Buchanan (185.5), Henry (158.5) and Mills (110.3). The three having the lowest rate for 1922 were: Palo Alto (6.3), Adair (7.0) and Mitchell (7.1) for 1923 Grundy and Osceola County show a negative report, Union County has a rate of (5.7).

CITIES—The three cities having the highest rate for 1922 were: Mason City (110.0), Muscatine (100.0), Ottumwa (94.8). For 1923 they were Davenport (103.5), Iowa City (103.0) and Fort Dodge (92.8). The three lowest for 1922 were: Sioux City 22.4, Cedar Rapids (38.4) and Fort Madison (39.3). For 1923 Marshalltown (24.3), Waterloo (28.2) and Council Bluffs (28.8).

SUMMARY OF RATES FOR PNEUMONIA AND SMALLPOX IN THE STATE OF IOWA FOR YEARS 1922 AND 1923

PNEUMONIA (ALL FORMS)

COUNTIES—The death rate per 100,000 population in the State of Iowa for the year of 1922 was 95.0 for the year 1923 it shows an increase of 3.7 or the rate of 98.7. The three counties having the highest rate for pneumonia for 1922 were: Johnson (188.0), Franklin (156.0) and Carroll

(146.0). For 1923 they were: Montgomery (163.0), Henry (158.3) and Johnson (156.5). The three counties with the lowest rate for 1922 were: Clay (18.5), Wright (38.4) and Keokuk (42.8). For 1923 they were: Humboldt (30.4), O'Brien (40.8) and Monona (46.4).

CITIES—The three cities having the highest rate for 1922 were: Council Bluffs (193.5), Burlington (158.0) and Mason City (147.0) For 1923 Iowa City had a rate of (275.0) followed by Fort Dodge with (185.5), Council Bluffs was next in order with (180.0). Those with the lowest rates for 1922 were Cedar Rapids (49.0), Muscatine City (68.7) and Fort Madison (86.7). For 1923 they were: Clinton City (41.8), Cedar Rapids (66.6) and Marshalltown (73.1).

SMALLPOX

COUNTIES—The death rate per 100,000 population in the State of Iowa for the year of 1922 was (.8) compared with 1923 (.2) showing a decrease for year of 1923 of (.6). All the counties for 1922 except Polk (.6), Pottawattamie (1.5), Carroll (4.5), Keokuk (4.7), Mills (6.4), Guthrie (22.6) and Taylor (25.7) showed a negative report of this disease. For 1923 all counties showed a negative report except Appanoose (3.2), Pottawattamie (4.7), Allamakee (5.8) and Webster (6.1).

CITIES—All cities showed a negative report for the year of 1922 except Council Bluffs with a rate of (2.7). Again in 1923 Council Bluffs was the only city which reported deaths from smallpox its rate for 1923 was (5.2). (5.2).

DEATH RATE (PER 100,000 POPULATION) FOR WHOOPING COUGH, TUBERCULOSIS AND PNEUMONIA FOR THE YEARS OF 1922 AND 1923 BY COUNTIES.

(Cities included within Counties)

Counties	Whooping Cough Rate		Tuberculosis Rate		Pneumonia Rate	
	1922	1923	1922	1923	1922	1923
Adair	0	0	7.0	7.0	84.5	91.3
Adams	0	0	9.6	28.5	86.5	75.8
Allamakee	0	0	23.2	34.8	104.0	115.9
Appanoose	0	16.1	45.4	22.5	112.0	99.9
Audubon	0	0	24.0	31.9	64.0	95.7
Benton	0	0	38.6	16.4	76.3	70.6
Black Hawk	1.7	5.0	42.9	30.0	104.0	110.0
Boone	0	9.8	39.6	45.9	69.3	68.8
Bremer	0	11.8	41.4	17.7	65.0	118.0
Buchanan	0	0	120.0	185.5	115.0	95.4
Buena Vista	0	5.2	21.0	31.0	47.2	67.3
Butler	5.5	0	39.0	16.6	55.6	110.9
Calhoun	0	0	27.9	49.5	67.0	105.6
Carroll	0	0	13.7	13.6	146.0	113.8
Cass	0	0	20.5	20.5	77.0	102.4
Cedar	0	11.4	34.3	57.0	91.5	74.2
Cerro Gordo	0	5.3	87.5	55.5	120.0	71.3
Cherokee	5.5	5.5	50.0	77.6	61.2	94.3
Chickasaw	0	12.9	39.0	45.3	71.4	123.1
Clarke	0	9.5	47.8	9.5	67.0	123.9
Clay	0	0	12.3	18.1	18.5	78.8
Clayton	0	0	47.1	54.8	86.2	84.0
Clinton	2.4	0	40.4	64.6	85.5	96.8
Crawford	4.8	24.3	14.5	4.7	121.0	86.8
Dallas	0	3.9	35.4	86.2	78.7	135.5
Davis	0	15.9	81.2	23.9	65.0	95.5
Decatur	6.0	0	24.1	42.1	108.0	90.2
Delaware	0	5.5	38.3	38.3	65.8	109.5
Des Moines	2.8	5.6	56.5	47.8	124.4	107.0
Dickinson	18.8	0	28.2	36.8	47.0	92.0
Dubuque	1.7	0	69.8	73.5	85.3	102.5
Emmet	0	0	15.2	21.6	60.7	50.4
Fayette	0	26.9	51.0	37.4	95.0	70.6
Floyd	0	10.3	31.2	20.6	83.4	124.0
Franklin	0	0	25.0	6.2	156.0	115.5
Fremont	0	0	38.9	25.8	84.4	97.2
Greene	0	12.0	12.1	12.0	56.5	108.0

DEATH RATE FOR WHOOPING COUGH, TUBERCULOSIS AND PNEUMONIA—Continued

Counties	Whooping Cough Rate		Tuberculosis Rate		Pneumonia Rate	
	1922	1923	1922	1923	1922	1923
Grundy	0	13.6	13.7	0	75.5	47.7
Guthrie	5.7	11.3	22.6	22.7	68.0	96.5
Hamilton	0	0	40.8	30.6	56.2	86.7
Hancock	0	6.5	26.5	19.6	79.4	84.6
Hardin	0	4.2	33.6	33.3	63.0	91.4
Harrison	8.1	6.7	56.6	26.9	84.8	67.3
Henry	0	0	118.0	158.5	145.0	158.3
Howard	0	14.4	28.9	21.6	79.5	64.6
Humboldt	0	0	15.2	30.4	53.4	30.4
Ida	0	16.1	34.0	8.4	59.5	76.2
Iowa	0	0	32.2	53.7	64.5	91.2
Jackson	0	10.0	30.5	40.0	107.0	130.5
Jasper	0	6.9	53.6	13.8	118.0	100.0
Jefferson	0	18.1	24.3	48.2	66.6	78.5
*Johnson	7.5	0	67.0	*14.8	188.0	156.5
Jones	0	0	32.4	48.3	54.0	96.7
Keokuk	0	15.4	28.8	46.2	71.7	123.2
Kossuth	0	3.8	15.6	11.5	42.8	92.3
Lee	2.5	2.4	52.2	49.1	104.0	110.5
Linn	0	5.2	44.9	56.1	63.7	79.6
Louisa	0	0	16.6	41.1	99.8	156.0
Lucas	0	0	37.2	18.6	49.5	80.4
Lyon	0	0	19.2	12.8	70.6	76.7
Madison	0	0	26.8	13.3	73.8	59.8
Mahaska	3.9	0	50.9	49.5	82.5	91.4
Marion	0	0	59.3	27.4	99.0	145.0
Marshall	3.0	15.0	45.3	30.0	11.8	51.0
Mills	0	32.4	182.2	110.3	125.0	136.0
Mitchell	0	0	7.1	49.8	114.0	149.3
Monona	5.8	5.8	23.2	17.4	75.5	46.4
Monroe	0	12.8	56.5	72.5	117.3	68.2
Montgomery	0	5.8	29.2	17.5	46.7	163.0
Muscatine	0	10.3	65.6	51.6	68.7	103.4
O'Brien	0	5.1	20.5	25.5	46.3	40.8
Osceola	0	0	47.7	0	47.7	66.0
Page	0	12.4	98.4	78.6	82.0	107.7
Palo Alto	0	0	6.3	12.6	56.8	75.7
Plymouth	0	4.2	21.1	8.4	80.0	80.3
Pocahontas	0	0	12.6	37.8	56.0	88.5
Polk	1.2	12.0	54.3	65.9	106.6	109.0
Pottawattamie	1.6	0	44.7	26.8	143.5	151.0
Poweshiek	0	0	30.0	25.0	85.0	95.0
Ringgold	0	7.7	15.5	23.2	85.3	58.1
Sac	0	5.6	22.6	11.2	73.6	50.6
Scott	0	5.3	71.7	86.5	130.0	148.9
Shelby	0	0	25.0	12.4	69.0	81.1
Sioux	0	7.5	22.4	11.2	52.5	85.8
Story	0	3.7	30.0	33.5	56.5	67.0
Tama	0	0	45.8	50.4	91.8	96.4
Taylor	6.5	0	32.6	32.2	58.6	116.0
Union	0	0	23.0	5.7	92.0	114.7
Van Buren	0	0	57.6	78.4	50.5	71.3
Wapello	0	2.4	68.5	61.6	116.0	128.0
Warren	0	5.5	27.8	24.3	85.3	72.1
Washington	4.9	4.9	19.5	39.0	97.5	68.3
Wayne	13.1	6.5	46.0	39.1	105.0	117.0
Webster	13.1	13.6	60.3	73.5	91.7	120.0
Winnebago	7.2	7.2	79.7	28.7	79.7	129.0
Winneshiek	0	9.0	49.7	63.2	45.2	54.2
Woodbury	2.6	5.9	25.8	37.7	107.0	89.3
Worth	8.4	0	25.0	41.4	50.0	107.4
Wright	0	4.7	48.0	23.7	38.4	85.7
The State	1.7	6.1	43.5	42.9	95.0	98.7

*State Sanitorium for Tuberculosis located at Oakdale, Johnson County. Deaths occurring in this institution were charged back to county from which admitted. Counting these deaths, rate for Johnson County, 1923 would be 294.0.

DEATH RATE (PER 100,000 POPULATION) FOR WHOOPING COUGH, TUBERCULOSIS AND PNEUMONIA FOR THE YEARS OF 1922 AND 1923 FOR CITIES

Cities	Whooping Cough Rate		Tuberculosis Rate		Pneumonia Rate	
	1922	1923	1922	1923	1922	1923
Boone	*	0	*	38.7	*	107.1
Burlington	4.2	8.3	62.5	58.3	158.0	120.8
Cedar Rapids	0	2.1	38.4	56.2	49.0	66.6
Clinton	3.9	0	58.8	82.8	117.6	41.8
Council Bluffs	0	0	64.0	28.8	193.5	180.0
Davenport	0	6.9	84.0	103.5	134.5	153.5
Des Moines	1.5	13.0	52.0	57.7	111.5	115.5
Dubuque	2.5	0	89.0	104.0	104.5	122.0
Ft. Dodge	19.9	19.5	79.8	92.8	134.0	185.5
Ft. Madison	0	7.7	39.3	69.2	86.7	92.3
Iowa City	*	0	*	103.0	*	275.0
Keokuk	6.9	0	69.0	48.2	131.1	123.8
Marshalltown	6.2	24.3	61.7	24.3	111.0	73.1
Mason City	0	4.3	110.0	65.2	147.0	82.5
Muscatine	0	18.7	100.0	62.3	68.7	106.0
Ottumwa	0	3.7	94.8	84.3	146.5	143.0
Sioux City	2.4	5.1	22.4	37.1	109.0	94.7
Waterloo	2.6	2.6	52.5	28.2	118.0	110.5

*Figures for Boone City and Iowa City not kept separate for 1922.

BIRTHS

The Birth Rate for the State of Iowa, exclusive of stillbirths, was 20.8 per 1,000 population for the year of 1923, compared to 20.7 for the year of 1922. The total number of births reported in the year 1923 was 51,305 (Males 26,398) (Females 24,907). In the year of 1922 there were 50,736 births reported divided as follows: Males 26,066, Females 24,670. There were 231 colored births reported for the year of 1922 and 295 for the year of 1923. During 1922 there were 687 illegitimate children born and 594 during the year 1923.

Keokuk County had the highest birth rate for 1923 (31.4) per 1,000 population. Osceola County had the highest birth rate for 1922 with 28.7. The county with the lowest birth rate for 1923 was Taylor with 12.6. Ringgold County carried the banner with 11.6 for 1922.

The estimated population of Iowa for 1923 was 2,457,796, an estimated increase of 17,925 over the year of 1922.

NUMBER OF BIRTHS WITH RATE (PER 1,000 POPULATION) FOR THE YEARS 1922-1923

(Cities included within the Counties)

Counties	Births		Birth Rate	
	1922	1923	1922	1923
Adair	313	288	21.9	20.2
Adams	249	218	23.7	20.7
Allamakee	337	376	19.4	21.8
Appanoose	674	715	21.7	23.0
Audubon	298	307	23.0	24.5
Benton	462	454	18.1	18.7
Black Hawk	1,128	1,148	19.1	19.2
Boone	610	597	19.0	19.5
Bremer	364	352	21.5	20.8
Buchanan	366	412	18.5	20.6
Buena Vista	344	365	17.1	18.9
Butler	407	379	22.6	21.0
Calhoun	377	434	21.3	24.1
Carroll	585	493	26.6	22.4
Cass	446	411	28.0	21.3
Cedar	309	355	17.9	20.2
Cerro Gordo	705	762	18.1	20.1
Cherokee	354	421	19.7	23.3
Chickasaw	323	352	20.8	22.8
Clarke	206	220	19.6	20.9
Clay	334	423	20.5	25.6
Clayton	523	510	20.8	20.4
Clinton	715	784	16.4	18.1
Crawford	460	449	22.2	21.6
Dallas	458	537	18.0	21.0
Davis	293	216	23.3	17.2
Decatur	345	340	20.7	20.4
Delaware	457	439	25.0	24.1
Des Moines	713	789	20.0	22.2
Dickinson	197	206	18.4	18.9
Dubuque	1,387	1,287	26.4	22.0
Emmet	334	346	25.3	24.9
Fayette	592	578	20.0	19.4
Floyd	534	301	17.9	15.5
Franklin	384	495	23.9	25.1
Fremont	347	245	22.4	15.9
Greene	384	282	17.1	16.9
Grundy	305	302	20.8	20.6
Guthrie	347	397	19.6	22.5
Hamilton	460	460	23.4	23.5
Hancock	342	336	22.6	21.9
Hardin	454	483	19.0	20.1
Harrison	490	495	19.8	19.1
Henry	353	315	13.8	17.2
Howard	219	254	15.8	18.2
Humboldt	305	274	23.2	20.8
Ida	276	268	23.5	22.7
Iowa	407	342	21.8	18.3
Jackson	382	377	19.6	18.9
Jasper	524	568	18.7	19.5
Jefferson	292	333	17.6	19.9
Johnson	670	754	25.0	28.1
Jones	320	351	17.1	18.9
Keokuk	335	409	15.9	31.4
Kossuth	691	663	26.8	25.4
Lee	775	795	19.1	19.5
Linn	1,403	1,383	18.3	18.0
Louisa	253	218	20.4	17.9
Lucas	287	336	17.7	20.8
Lyon	381	363	24.4	23.2
Madison	295	284	19.6	18.9
Mahaska	488	462	18.5	17.6
Marion	544	449	21.4	17.6
Marshall	593	798	17.9	23.9
Mills	260	256	16.8	16.6

NUMBER OF BIRTHS—Continued

Counties	Births		Birth Rate	
	1922	1923	1922	1923
Mitchell	321	291	22.9	20.7
Monona	426	380	24.7	22.0
Monroe	458	496	19.5	21.1
Montgomery	312	298	17.6	17.3
Muscatine	533	619	18.3	21.3
O'Brien	375	296	18.8	15.1
Osceola	301	279	28.7	26.3
Page	419	519	17.2	21.5
Palo Alto	410	343	25.9	21.6
Plymouth	522	520	22.0	21.9
Pocahontas	403	415	25.5	26.1
Polk	3,459	3,517	21.3	21.6
Pottawattamie	1,365	1,461	21.6	23.0
Poweshiek	396	401	19.3	20.0
Ringgold	233	278	11.6	21.5
Sac	456	426	25.5	23.9
Scott	1,378	1,304	17.6	17.3
Shelby	368	367	22.8	22.9
Sioux	717	803	26.8	29.9
Story	692	676	26.0	25.2
Tama	402	448	18.3	20.4
Taylor	210	196	13.5	12.6
Union	323	319	18.6	18.3
Van Buren	280	263	19.9	18.8
Wapello	772	799	20.2	18.9
Warren	384	324	21.2	17.9
Washington	454	409	22.1	19.9
Wayne	309	316	20.1	20.6
Webster	975	917	20.1	24.9
Winnebago	335	313	24.2	22.4
Winneshiek	445	480	20.1	21.6
Woodbury	2,230	2,222	22.9	22.0
Worth	260	267	21.7	22.0
Wright	440	423	21.1	20.1
The State	50,736	51,305	20.7	20.8

NUMBER OF BIRTHS WITH RATES (PER 1,000 POPULATION) FOR EIGHTEEN CITIES IN THE STATE OF IOWA, 1922-1923

Cities	Births		Birth Rate	
	1922	1923	1922	1923
Boone	*	257	*	19.7
Burlington	534	580	22.1	24.1
Cedar Rapids	935	937	19.4	19.5
Clinton	410	452	16.5	18.7
Council Bluffs	848	929	22.5	24.3
Davenport	992	992	16.7	17.1
Des Moines	2,072	3,059	22.0	22.1
Dubuque	1,029	849	26.1	21.6
Fort Dodge	532	512	26.4	24.9
Fort Madison	251	259	19.7	19.9
†Iowa City	*	451	*	38.9†
Keokuk	261	289	17.9	19.9
Marshalltown	330	423	20.3	25.7
Mason City	439	482	20.1	20.9
Muscatine	276	351	17.1	21.8
Ottumwa	523	547	22.4	20.0
Sioux City	1,711	1,602	22.5	21.6
Waterloo	719	736	18.9	18.9

*Figures for Boone City and Iowa City not kept separate for the year of 1922.
†Iowa State Maternity Hospital located at Iowa City.

SUMMARY OF INFANT MORTALITY (DEATHS UNDER ONE YEAR PER 1,000 LIVE BIRTHS)

Infant Mortality rates in the State of Iowa show a very slight decrease for 1923 over the rate for 1922. The rate for 1923 being 57.3 and 1922 it was 57.8.

COUNTIES—The three counties showing the highest infant mortality rate for 1922 were: Monona (103.7), Marion (95.3) and Ringgold (94.1). The three highest for 1923 were: Greene (106.3), Mitchell (92.8) and Monroe (84.8). The three counties having the lowest rate for 1922 were: Humboldt (16.3), Adair (22.0) and Worth (26.9). The three lowest for 1923 were: Grundy (23.2), Mills (23.4) and Lucas (23.8).

CITIES—The three cities having the highest rate for 1922 were: Sioux City (105.5), Clinton City (97.7) and Mason City (95.7). For 1923 Ottumwa (106.0), Fort Dodge (95.7) and Keokuk City (93.5). The three cities showing the lowest rate for 1922 were: Marshalltown (45.5), Dubuque City (49.6) and Fort Madison (51.8). For 1923 they were: Marshalltown (52.0), Cedar Rapids (53.4) and Muscatine City (57.0).

INFANT MORTALITY RATES (DEATHS UNDER ONE YEAR, PER 1,000 LIVE BIRTHS) 1922-1923

(Cities included within Counties)

Counties	Rate		Counties	Rate	
	1922	1923		1922	1923
Adair	22.0	41.7	Johnson	53.7	51.7
Adams	31.9	36.7	Jones	84.2	62.6
Allamakee	44.4	66.5	Keokuk	62.6	56.2
Appanoose	94.0	67.2	Kossuth	49.2	37.7
Audubon	40.0	84.7	Lee	54.0	67.6
Benton	38.8	41.8	Linn	54.5	52.7
Blackhawk	51.1	69.6	Louisa	62.2	68.8
Boone	41.3	70.5	Lucas	45.0	23.8
Bremer	46.7	73.9	Lyon	39.3	27.6
Buchanan	41.1	48.5	Madison	50.7	42.3
Buena Vista	43.6	54.8	Mahaska	46.8	47.6
Butler	53.7	58.0	Marion	95.3	62.3
Calhoun	60.3	55.3	Marshall	48.7	51.3
Carroll	53.0	62.8	Mills	53.7	23.4
Cass	46.2	41.4	Mitchell	37.4	92.8
Cedar	41.5	42.3	Monona	103.7	44.7
Cerro Gordo	85.7	60.4	Monroe	87.9	84.8
Cherokee	64.8	59.4	Montgomery	60.6	60.4
Chickasaw	52.5	71.7	Muscatine	70.4	55.3
Clarke	37.9	59.2	O'Brien	87.1	43.9
Clay	62.7	33.1	Osceola	42.9	53.8
Clayton	58.5	51.0	Page	56.4	55.9
Clinton	73.6	54.8	Palo Alto	34.0	52.5
Crawford	53.8	55.7	Plymouth	64.8	40.4
Dallas	58.7	61.5	Pocahontas	47.2	60.3
Davis	47.1	78.8	Polk	71.5	64.2
Decatur	52.0	70.6	Pottawattamie	66.5	65.7
Delaware	54.3	43.3	Poweshiek	37.6	54.8
Des Moines	62.8	60.8	Ringgold	94.1	50.4
Dickinson	45.2	29.1	Sac	48.0	49.4
Dubuque	44.7	59.1	Scott	57.4	65.1
Emmet	79.6	46.3	Shelby	46.3	32.7
Fayette	58.9	65.8	Sioux	37.6	36.1
Floyd	72.3	46.5	Story	54.7	44.4
Franklin	59.4	46.9	Tama	57.0	29.0
Fremont	43.1	45.0	Taylor	52.4	76.1
Greene	48.5	106.3	Union	65.0	62.7
Grundy	68.0	23.2	Van Buren	32.1	49.4
Guthrie	29.3	58.0	Wapello	57.7	53.8
Hamilton	64.7	43.5	Warren	36.4	46.3
Hancock	49.8	59.5	Washington	54.4	46.4
Hardin	50.2	49.6	Wayne	51.7	50.7
Harrison	63.2	40.5	Webster	57.3	69.8
Henry	74.9	41.2	Winnebago	32.7	70.3
Howard	82.1	63.0	Winneshiek	60.6	56.3
Humboldt	16.3	54.8	Woodbury	88.5	63.8
Ida	61.2	63.5	Worth	26.9	42.2
Iowa	58.7	38.0	Wright	47.4	68.5
Jackson	52.2	66.4			
Jasper	39.9	49.3	The State	57.8	57.3
Jefferson	66.6	66.6			

INFANT MORTALITY RATES (DEATHS UNDER ONE YEAR PER 1,000 LIVE BIRTHS) FOR CITIES IN THE STATE OF IOWA, 1922-1923

CITIES	Rate 1922	1923
Boone City	*	75.0
Burlington	65.6	27.5
Cedar Rapids	55.7	53.4
Clinton	97.7	66.4
Council Bluffs	68.3	60.3
Davenport	58.5	62.5
Des Moines	70.7	63.7
Dubuque	49.6	73.1
Fort Dodge	73.4	95.7
Fort Madison	51.8	61.8
Iowa City	*	70.9
Keokuk	80.5	93.5
Marshalltown	45.5	52.0
Mason City	95.7	72.6
Muscatine	61.6	57.0
Ottumwa	61.3	106.0
Sioux City	105.5	65.0
Waterloo	64.0	80.1

*Figures for Boone City and Iowa City not kept separate for 1922.

SUMMARY OF MARRIAGES AND DIVORCES FOR IOWA, 1922 AND 1923

IOWA

There were 23,516 marriages performed and 4,327 divorces granted in the State of Iowa during the calendar year of 1923. For the calendar year of 1922 there were 22,745 marriages and 3,862 divorces reported. The increase in marriages reported for 1923 over the number reported for 1922 is 711 or 3.4 per cent. The divorces reported for the year of 1923 show an increase of 465 or 12.0 per cent over the number reported in 1922.

SURVEY OF DIVORCES GRANTED IN THE STATE OF IOWA FOR YEAR 1923

The following figures show the number of divorces granted in the State of Iowa during the year of 1923, classified as follows:

1. Period of time of marriage before divorce was granted.
2. Husband or wife instituting proceedings.
3. Number of proceedings contested.
4. Causes.
5. Children affected.

LENGTH OF TIME MARRIED BEFORE DIVORCE WAS GRANTED

Married	Families	Married	Families
1 day	2	8 years	161
2 days	1	9 years	153
5 days	1	10 years	146
15 days	2	11 years	145
20 days	5	12 years	105
1 month	13	13 years	102
2 months	21	14 years	78
3 months	22	15 years	85
4 months	25	16 years	64
5 months	45	17 years	64
6 months	38	18 years	57
7 months	26	19 years	56
8 months	20	20 years	40
9 months	36	21 years	44
10 months	29	22 years	39
11 months	24	23 years	34
1 year	224	24 years	31
2 years	429	25 years	27
3 years	450	26 years	39
4 years	351	27 years	20
5 years	272	28 years	22
6 years	217	29 years	20
7 years	198	30 years	19

There were 134 divorces granted from 31 years on. The longest period of time of marriage before divorce being granted was 54 years.

There were 3,018 wives instituted proceedings for divorce compared with 1,132 husbands. In nine cases the libellant was not reported.

There were 293 cases contested and 2,539 not contested. 1,340 cases not reported, i. e., record did not show whether cases were contested.

There were 2,776 divorces granted on account of cruel and inhuman treatment, 2,236 where husband was accused and 540 where wife was accused.

Two hundred fifty-six (256) divorces were granted on account of adultery, 91 by husband and 165 by wife.

Desertion, 866 divorces granted, 512 by husband and 354 by wife.

Felony, 56 divorces granted, 51 by husband and 5 by wife.

Drunkenness, 118 divorces granted, 106 by husband and 12 by wife.

Other causes not specified, 51.

Children affected, 2,576.

NOTE: There were 168 divorces reported too late for classification in this report.

NUMBER OF MARRIAGES AND DIVORCES REPORTED IN THE STATE OF IOWA FOR YEARS OF 1922 AND 1923

Counties	Marriages		Divorces	
	1922	1923	1922	1923
Adair	71	72	6	9
Adams	69	92	10	9
Allamakee	127	111	6	2
Appanoose	277	61	50	37
Audubon	79	104	2	8
Benton	137	156	41	28
Black Hawk	637	802	158	142
Boone	318	318	44	36
Bremer	187	135	12	15
Buchanan	163	182	18	17
Buena Vista	150	125	14	15
Butler	91	92	13	10
Calhoun	119	143	11	11
Carroll	195	201	10	16
Cass	155	168	23	21
Cedar	89	95	14	17
Cerro Gordo	433	370	69	109
Cherokee	117	115	16	20
Chickasaw	190	270	9	5
Clarke	98	111	23	21
Clay	154	162	19	28
Clayton	174	191	11	17
Clinton	485	509	70	54
Crawford	151	150	13	21
Dallas	286	204	33	40
Davis	83	25	11	2
Decatur	123	135	23	21
Delaware	174	152	23	10
Des Moines	443	460	78	101
Dickinson	107	104	11	16
Dubuque	657	284	59	61
Emmet	104	82	11	19
Fayette	178	202	35	31
Floyd	157	160	28	14
Franklin	101	114	12	13
Fremont	116	213	14	17
Greene	149	138	17	8

NUMBER OF MARRIAGES AND DIVORCES—Continued

Counties	Marriages		Divorces	
	1922	1923	1922	1923
Grundy	77	89	7	11
Guthrie	105	98	19	13
Hamilton	161	84	15	15
Hancock	98	81	4	4
Hardin	161	178	16	13
Harrison	171	218	30	25
Henry	156	179	26	22
Howard	94	105	2	2
Humboldt	76	82	13	14
Ida	78	89	10	6
Iowa	124	141	8	13
Jackson	156	110	13	14
Jasper	239	209	20	34
Jefferson	124	133	12	29
Johnson	288	332	31	34
Jones	135	113	19	16
Keokuk	127	120	13	13
Kossuth	184	170	8	16
Lee	572	602	101	109
Linn	844	468	227	278
Louisa	77	52	12	14
Lucas	130	159	15	24
Lyon	110	86	8	4
Madison	92	104	12	11
Mahaska	283	288	35	71
Marion	173	173	30	33
Marshall	309	315	39	73
Mills	147	294	13	11
Mitchell	74	77	9	7
Monona	141	124	21	9
Monroe	193	143	32	26
Montgomery	126	170	10	17
Muscatine	330	314	78	84
O'Brien	112	54	13	6
Osceola	86	106	3	5
Page	194	204	33	44
Palo Alto	89	95	14	10
Plymouth	163	160	12	13
Pocahontas	89	89	7	9
Polk	2,224	2,266	773	893
Pottawattamie	1,227	2,337	188	235
Poweshiek	117	95	20	16
Ringgold	44	94	4	18
Sac	134	105	17	12
Scott	771	853	172	241
Shelby	98	97	6	3
Sioux	97	228	12	10
Story	239	210	20	22
Tama	145	160	16	30
Taylor	102	113	10	20
Union	189	173	23	32
Van Buren	67	67	19	13
Wapello	535	508	106	108
Warren	230	248	6	11
Washington	120	125	14	13
Wayne	102	101	11	15
Webster	444	424	66	77
Winnebago	100	63	7	5
Winneshiek	156	137	6	8
Woodbury	1,141	1,280	348	351
Worth	82	76	5	4
Wright	151	140	11	22
Total	22,745	23,516	3,862	4,327

NOTE: Figures are not kept separate for cities.

COMMUNICABLE DISEASES REPORTED BY MONTHS, 1922-1923

	Cerebrospinal Meningitis	Diphtheria	Poliomyelitis	Scarlet Fever	Smallpox	Chickenpox	Mumps	Whooping Cough	Chancroid	Gonorrhea	Syphilis	Pneumonia	Tuberculosis	Typhoid Fever	Influenza	Measles	Rabies
January, 1922	4	237	0	450	223	75	12	2	3	140	81	22	1	2	6	18	0
1923	4	218	4	503	51	156	108	13	2	159	7	27	4	4	0	76	0
February, 1922	3	99	3	339	157	36	9	2	5	141	96	8	1	1	2	11	0
1923	0	142	1	509	37	102	140	13	1	118	47	30	16	2	7	119	0
March, 1922	2	75	2	279	139	27	6	1	3	88	42	7	2	0	18	11	0
1923	2	116	1	500	69	50	230	26	1	127	137	58	3	2	234	325	4
April, 1922	2	53	0	169	57	34	4	1	1	107	42	0	7	2	0	18	0
1923	1	100	1	493	115	86	98	56	3	208	223	0	0	0	0	517	0
May, 1922	1	40	2	113	76	8	8	0	4	100	29	0	0	4	0	13	0
1923	0	72	1	387	153	62	53	60	1	115	110	13		1	0	738	0
June, 1922	2	63	0	85	44	7	3	1	6	182	45	0	0	2	0	19	0
1923	0	61	0	166	103	23	10	82	1	235	219	4	1	3	0	407	0
July, 1922	1	51	2	70	12	11	1	0	5	223	101	0	2	1	0	4	0
1923	0	58	0	61	22	5	3	70	0	172	104	1	6	8	1	60	0
August, 1922	3	65	1	48	8	1	0	0	4	245	84	0	3	17	0	2	0
1923	0	74	22	78	14	1	0	14	4	297	102	2	14	25	0	10	0
September, 1922	3	210	4	130	5	6	0	3	3	310	126	0	0	8	0	3	0
1923	1	24	170	125	13	9	3	9	4	283	97	0	4	18	0	5	0
October, 1922	0	484	2	322	5	26	5	1	5	200	47	1	3	2	0	2	0
1923	1	230	7	220	18	22	7	37	1	236	154	2	1	13	0	27	0
November, 1922	1	539	2	448	13	94	33	9	3	129	57	0	0	9	0	5	0
1923	1	239	1	328	43	132	39	58	2	160	108	6	3	10	0	120	0
December, 1922	1	357	3	421	10	124	38	7	4	173	86	19	6	1	0	12	0
1923	2	173	0	338	30	186	99	56	3	214	96	8	0	16	0	283	0
Year, 1922	23	2,273	21	2,874	749	449	109	27	46	1,938	833	57	25	49	20	119	0
1923	12	1,507	208	3,708	668	843	790	503	23	2,324	1,474	151	74	102	242	2,687	1

REPORT OF CERTIFIED COPIES ISSUED (BY MONTHS) FOR YEARS, 1922-1923

	Births			Deaths			
	Fee received	Government compensation	Total	Fee received	Pension and war risk insurance	Total	Grand total
January, 1922	8	8	16	29	15	40	69
1923	2	22	24	76	79	155	179
February, 1922	7	13	20	35	20	55	75
1923	3	17	20	43	31	74	94
March, 1922	5	19	24	27	19	46	70
1923	0	18	18	42	22	64	82
April, 1922	1	10	11	43	32	75	86
1923	1	20	21	38	31	69	90
May, 1922	0	3	3	16	25	41	44
1923	1	13	14	41	25	66	80
June, 1922	2	6	8	35	31	66	74
1923	3	14	17	43	41	84	101
July, 1922	2	17	19	25	30	55	74
1923	0	8	8	32	37	69	77
August, 1922	2	8	10	25	34	59	69
1923	3	12	15	24	31	55	70
September, 1922	0	10	10	37	23	60	70
1923	5	17	22	36	25	61	83
October, 1922	1	19	20	36	30	66	86
1923	4	14	18	31	23	54	72
November, 1922	1	17	18	51	12	43	61
1923	2	16	18	34	24	58	76
December, 1922	0	23	23	42	27	69	92
1923	3	14	17	36	17	53	70
Year, 1922	24	158	182	381	298	679	861
1923	27	185	212	476	386	862	1,074
Total for two years	51	343	394	857	684	1,541	1,935

REPORT OF SANITARY ENGINEER

H. V. PEDERSON, Civil and Sanitary Engineer

For the past two years the Division of Sanitary Engineering has been actively engaged in locating sanitary defects in water systems in the State and assisting city and town councils in correcting unsanitary conditions which tend to influence the health of the people of a community. It has also given advice pertaining to public nuisances and has rendered assistance in securing abatement. Preliminary surveys have been made of portions of five different rivers to determine various sources of pollution. It has been the keen desire of this Division to render efficient and valuable service to the people of the State, and it is

the desire to continue as in the past, and to increase this service that the following report and recommendations are made.

During the biennium which this report covers the Division of Sanitary Engineering consisted of one Sanitary Engineer, who was also a member of the board, and one Assistant Engineer employed upon special permission by the State Executive Council. According to the rules and regulations of the board, the Engineer is charged with the duty of making sanitary surveys of public water supplies, sewer systems, sewage treatment plants, and garbage and refuse disposal plants throughout the state, and directing the methods of installing and operation of the same. He is also charged with the duty of making a sanitary survey of the sanitary conditions in any locality of the state upon written petition of five or more citizens from said locality. After the Fortieth General Assembly had passed the law making the State Board of Health responsible for the prevention of stream pollution, the Engineer was charged with making surveys of these rivers on which complaints had been received. In addition to the field investigation and surveys the Engineering Division is charged with the duty of approving plans and specifications for new public water and sewer systems, and to advise the city officials on the practicability and advisability of installing certain public utilities. All letters pertaining to any engineering subject received in the office of the Department are turned over to the Engineering Division for answering and these inquiries have amounted to several thousand each year.

The following brief summary will give an idea or scope of some of the more important lines of work handled during the past two years.

Sanitary surveys of public water supplies	101
Investigations of sewage disposal plants	30
Investigation relative to sewer systems	7
Inspection of water supplies used in interstate traffic	147
Investigation made in stream pollution work	18
Investigation made of public nuisances	46
Investigation of garbage disposal methods	15
Conferences held and lectures given	27
Number of water plans approved	32
Number of sewer plans approved	65
Investigation of touring camps	5
Publication of engineering educational bulletins	2

A review of the work of the water laboratory shows that samples of 353 different public water supplies were analyzed during the biennium. The majority of these supplies were tested on an average of from one to seven times and it is interesting to note that comparatively few municipalities have a public water supply that continually receives a satisfactory report. 282 supplies analyzed received at least one unsatisfactory report during the biennium, showing that the supply is not entirely free from intermittent contamination. There were 1,091 different private well supplies analyzed at the laboratory of which 735 were reported as unsatisfactory and 194 as doubtful.

If a maximum service were to be rendered in the state for preventing water borne diseases, the Sanitary Engineering Division should investigate every public or private water supply that has been reported as un-

safe by the water analyst at Iowa City. Comparing the number of investigations of water supplies made by this department, with the number of unsanitary and unsatisfactory supplies as reported by the water laboratory, a marked difference can easily be noted. This difference is due primarily to the fact that the Division, because of lack of personnel has been unable to do more work. Every sanitary survey made of water supplies was at the direct request of city officials or local health officers. Not a single survey was made of a private supply located either in the rural districts or in the smaller communities. When we realize that by far the greater per cent of the number of typhoid cases traced to impure water supplies occur in the rural districts, and when we stop to consider the number of people in the state who are unwittingly drinking a water that can not be considered safe, we can only conclude that as yet the state of Iowa is not receiving the protection which it should expect.

The Sanitary Engineering Division simply cannot do all the field work which it should do to be of maximum service to the state, because of lack of personnel. It cannot begin to make the surveys or carry on the educational work that is necessary to safeguard the water supplies. The very fact that there are 735 privately owned wells in the state that were labeled unsafe during the past two years by the laboratory is definite proof that there is still a large field for future educational work.

The problem of keeping the water supply in the state fit for drinking is ever growing more and more complex and difficult, and if definite steps are not taken to correct the many defects in water systems or private wells, or to conserve the underground waters and control the surface waters, there will be a terrible day of reckoning. The State Board of Health through its Engineering Division has made a good start in reducing the number of typhoid cases per year, but if an adequate state organization is not provided to cope with the increased growth in the population and consequently the increased problem in sanitation, this cursed disease may become more rampant. Sewage treatment and water purification go hand in hand. If one is neglected the effects are quickly noticed in the other. There are at the present time about 190 sewage treatment plants in the state built for the purpose of preventing domestic sewage from polluting the rivers and other bodies of water of the state. It is imperative that every municipal treatment plant work at its maximum efficiency at all times to prevent pollution and to lessen the work of water purification for domestic supplies.

Within the past two years only thirty sewage treatment plants could be visited by this department to assist councils in putting their plants in operation. City councils are continually changing personnel and it happens a good many times that the new members are poorly informed, when elected, as to the proper operation of sewage treatment plants. Many treatment plants are neglected because their operation is not understood and it is not infrequent that a plant becomes totally incapacitated because of lack of proper attention. The problem is one of education, or calling to the attention of the various new councils the fact that they must not neglect this public utility.

The Division of Sanitary Engineering might render a much greater service to the state if it was provided with the necessary assistance. One engineer engaged in instructing new councils in the art of taking care of their sewage treatment plants can, in one year's time, save the state a considerable amount of money. The Engineering Division should be looked up to and considered every bit as much of a school for teaching principles of sanitation as the College of Engineering at Ames or the University. The only difference is that while the state schools are teaching young men to become Sanitary Engineers the Division of Engineering of the State Health Department teaches new city and town councils the importance of keeping their cities and towns in a sanitary condition, and to operate the municipal sewage treatment plants successfully, and protect the public water supplies.

The Sanitary Engineering Division should by all logical reasoning be the largest division of the State Board of Health, and should have a personnel capable of covering the state to give instructions in sanitation. The division should consist of a chief sanitary engineer, and two full time assistant engineers. It should also have a man trained in chemistry to carry out the necessary field laboratory work in the study of stream pollution and it should have a field laboratory equipped for this work. Then provision should be made to make it possible to employ various college instructors during the summer months for special investigation and surveys. A full time stenographer should also be provided as part of the Engineering Division to assist in office work.

APPROVAL OF PLANS AND SPECIFICATIONS

When plans and specifications of sewerage systems, water work systems and garbage disposal systems, are received by the Division of Sanitary Engineering they are carefully checked over to see whether or not they contain the various essential requirements. The granting of the approval does not mean that the plans are the very best that can be designed, but only means that they contain the essential requirements and that the system when built will do the work intended of it. It means that the designer has complied with good sanitary engineering practice, and that the plant when constructed will perform satisfactorily.

When the plans are checked the question of economical design is not taken into account. If any plan is submitted which is considered an expensive installation, the city officials are generally notified, but this fact does not necessarily influence the granting of an approval. The town or city council is expected to use judgment in the question of costs, and is not to rely on the approval of the Department of Health. The approval simply means that the essentials of the design are correct, and that the system when built will get by.

APPROVAL OF PLANS AND SPECIFICATIONS

Adel, Dallas County, Population 1,455, May 18th, 1923. Plans and specifications for water purification as submited by E. W. Bacharach & Co. of Kansas City, Mo. Plans provided for aeration, sedimentation with aid of alum as coagulant, and filtration by rapid sand filters. Plans were approved under the condition that chlorination be added.

Allison, Butler County, Population 520, February 23d, 1924. Plans and specifications for complete sanitary sewer system as submitted by Currie

Engineering Company of Webster City. Treatment plant consists Cameron tank and intermittent sand filters.

Alvord, Lyon County, Population 359, September 22d, 1923. Plans and specifications for sanitary sewer system, prepared by W. E. Buell and Co. Entire town is to be sewered in one sanitary district. Treatment plant consists of Imhoff tank, and trickling filters.

Anamosa, Jones County, Population 2,881, October 7th, 1922. Plans and specifications for sewage treatment plant for the State Reformatory, submitted by Lafayette Higgins of Des Moines. Treatment plant consists of double Imhoff tank, siphon chamber, trickling filter and sludge bed.

Bedford, Taylor County, Population 2,073, February 27, 1923. Plans and specifications for sewer extensions and improvements to treatment plant including trickling filter and dosing chamber. Submitted by Henningson Engineering Company of Omaha.

Blairstown, Benton County, Population 584, July 7th, 1922. Plans and specifications for complete sewer system, prepared by M. Tschirgi and Sons of Cedar Rapids. These plans provide for the sewering of the town in one sewer district. The sewage treatment plant consists of shallow septic tank, dosing chamber, intermittent sand filter and emergency lift for clearing sand beds.

Brandon, Buchanan County, Population 343, August 16th, 1922. Plans and specifications for complete water works system prepared by the Currie Engineering Co. Plans provide for deep well pump, pump house, water mains to cover entire town, and 40,000 gallon steel, pressure tank. Water is to be supplied by one deep, drilled well.

Brandon, Buchanan County, Population 343, September 20, 1922. Plans and specifications for complete sanitary sewer system, as prepared by the Currie Engineering Company. Designed to serve the entire town in one sewer district. Sewage treatment plant consists of Imhoff tank, siphon chamber, sludge bed and intermittent sand filters.

Brooklyn, Poweshiek County, Population 1,533, February 23, 1923. Plans and specifications for iron removal plant consisting of aerator, sedimentation basin, two filters, clear well and apparatus for adding lime as a coagulant. Submitted by Brown and Cook of Ottumwa, Iowa.

Burlington, Des Moines County, Population 24,057, July 18, 1923. Plans and specifications for sewage treatment plant to serve about 1,000 population, including ejector station, Imhoff tank and either sand or stone filters, and sludge bed. Submitted by M. G. Hall of Centerville.

Carlisle, Warren County, Population 640, October 2d, 1923. Plans and specifications for complete waterworks system as submitted by W. E. Buell and Company. Plans provide for 290 foot well, pump house and equipment and 40,000 gallon storage tank.

Carroll, Carroll County, Population 4,254, October 6th, 1922. Plans and specifications for sewer extension. Extensions are divided into two districts, each being provided with a lift station. Plans submitted by G. C. Eelter of Carroll, Iowa.

Cascade, Dubuque County, Population 1,249, September 23d, 1922. Plans and specifications for complete sewer system, as designed by the Currie Engineering Co. Plans provide that the town be covered in one sewer district. Sewage treatment plant consists of Imhoff tank, siphon chamber, sludge bed and intermittent sand filters.

Chariton, Lucas County, Population 5,175, November 24th, 1922. Plans and specifications for extension to the water purification plant including two filters, settling basin and chemical house as submitted by M. G. Hall.

Charles City, Floyd County, Population 7,350, June 12th, 1923. Plans for proposed water main extension for district south and west of river, as submitted by J. S. Dawson, city engineer.

Clear Lake, Cerro Gordo County, Population 2,804, January 18, 1923. Plans and specifications for complete sewage treatment plant including double Imhoff tank, trickling filters and sludge bed. Plans submitted by Currie Engineering Co. of Webster City.

Colfax, Jasper County, Population 2,504, October 30, 1922. Plans for sewer extensions on Chautauqua and Cherry street, and on Division and Maple streets.

Conrad, Grundy County, Population 560, June 13, 1923. Plans for sewer extensions on Center St. and Lincoln St. Submitted by E. A. Crary of Grundy Center.

Coulter, Franklin County, Population 277, April 30, 1923. Plans and specifications for water works system complete. Plans provide for pump, pumping equipment, distribution system and 40,000 gallon pressure tower. Submitted by H. R. Green of Cedar Rapids.

Cresco, Howard County, Population 3,199, July 5th, 1922. Plans and specifications for water extensions on West Third Street.

Cresco, Howard County, Population 3,195, April 7th, 1923. Plans for water extensions as prepared by city engineer.

Cresco, Howard County, Population 3,195, May 7th, 1923. Plans for water main extensions on 1st Ave. E. and 2nd Ave. E.

Cresco, Howard County, Population 3,195, March 28th 1924. Plans and specifications for water extensions and for construction of deep well, as submitted by J. H. Howe, City Engineer.

Creston, Union County, Population 8,034, May 10th, 1923. Plans and specifications for sewage treatment plant for south side. Plans were submitted by P. K. De Voe, city engineer, and provided for Cameron tank with intermittent sand filters.

Delmar, Clinton County, Population 527, July 3d, 1923. Plans for 4-inch water main extensions on Lincoln Avenue, Ridge Avenue, Spark Avenue, Market Street and Center Street. Submitted by J. G. Thorne.

De Witt, Clinton County, Population 1,849, August 25th, 1923. Plans and specifications for extensions and alterations to sewage treatment plant as submitted by Chas. P. Chase.

Dow City, Crawford County, Population 572, April 12th, 1923. Plans and specifications for sanitary sewer system, sewering the town in one district. Sewage treatment plant consists of Imhoff tank, dosing chamber and intermittent sand filters. Plans submitted by W. E. Buell and Co.

Dow City, Crawford County, Population 572, July 18th, 1923. Alley plan for sewer system as submitted by W. E. Buell & Co.

Dubuque, Dubuque County, Population 39,141, August 1st, 1922. Plans for sewer extension on Auburn Street between Dexter and West 14th, Gilmore street, between West 5th and Cooper, and Rush street.

Dubuque, Dubuque County, Population 39,140, October 6th, 1922. Plans for sewer extension on Audubon, Fulton, King, Putman, Muscatine, Hill, Harlan, Greeley and Broadway streets. Plans submitted by the City of Dubuque.

Dubuque, Dubuque County, Population 39,140, October 23, 1922. Plans for main intercepting sanitary and storm sewer. Plans provide that the storm sewer be constructed in the same trench and above the sanitary sewer. No sewage treatment plant is provided.

Dubuque, Dubuque County, Population 39,141, November 5th, 1922. Plans and specifications for 6-inch sewer extensions on Needham, Washington and Walsh streets as submitted by the city of Dubuque.

Dubuque, Dubuque County, Population 39,141, May 23d, 1923. Plans for several proposed sewer extensions submitted by the city eningeer.

Dubuque, Dubuque County, Population 39,141, Septembr 8, 1923. Plans for sewer extension, prepared by City Engineer, for the following streets: Kirkwood, Althower, Jones, Seminary and alley between Langworthy and Edith.

Dubuque, Dubuque County, Population 39,141, October 18th, 1923. Plans for sewer extensions in Inwood Addition.

Emerson, Mills County, Population 475, April 6th, 1923. Plans and specifications for complete water works system, including well, pumping equipment, distribution system and 40,000 gallon elevated steel tank.

Emerson, Mills County, Population 475, April 6th, 1923. Plans and specifications for sanitary sewer system complete. Plans provide for sewering the town in one district. Treatment plant consists of Imhoff tank, dosing chamber and intermittent sand filters. Plans prepared by W. E. Buell & Co. of Sioux City.

Garrison, Benton County, Population 489, March 26th, 1923. Plans and specifications for water works system consisting of pump house and pumping equipment and distribution system including mains and 30,000 gallon, elevated steel tank. Submitted by W. E. Buell and Co. of Sioux City.

Glidden, Carroll County, Population 867, October 28th, 1922. Plans and specifications for complete sanitary sewer system as submitted by W. E. Buell and Co. of Sioux City. Plans provide for the sewering of the entire town in one sewer district. Treatment plant consists of Imhoff tank, dosing chamber, and intermittent sand filters.

Greene, Butler County, Population 1,375, July 14th, 1923. Plans and specifications for sewer extensions and two sewage treatment plants consisting of septic tanks and trickling filters. Submitted by Nathon Barber of Waterloo.

Hartley, O'Brien County, Population 1,306, October 16th, 1922. Plans and specifications for sewage treatment plant submitted by Henningson Engineering Co. of Omaha, Nebraska. Treatment plant consists of Imhoff tank, sludge bed and trickling filters.

Hartley, O'Brien County, Population 1,306, February 27th, 1923. Plans and specifications for remodeling sewage treatment plant and making sewer extensions. Plans provide for change in intake, reducing siphon chamber and adding trickling filter. Henningson engineers of Omaha submitted the plans.

Holstein, Ida County, Population 1,248, October 5th, 1922. Plans and specifications for sewer extensions on Second St., Hamburg St., Davenport St., and Cleveland St., submitted by Bruce and Grupp, engineers of Omaha, Nebraska.

Iowa City, Johnson County, Population 11,267, July 26th, 1923. Plans and specifications for main trunk line sewer on west side of Iowa river as submitted by F. E. Young, city engineer. Temporary approval given.

Iowa City, Johnson County, Population 11,267, September 10, 1923. Plans for system of sewer laterals covering district in West Iowa City, as prepared by F. E. Young, city engineer. No approval given because treament plant was omitted.

Kalona, Washington County, Population 632, August 13th, 1922. Plans and specifications for a complete water works system prepared by the Buell Engineering Co. Plans provide for pump, pump house, mains and 50,000 gallon steel pressure tank. Water is supplied by one well.

Kalona, Washington County, Population 632, June 25th, 1923. Plans and specifications for sanitary sewer system, providing for the sewering of the town in one district and treatment plant consisting of Imhoff tank and trickling filter. Also pump lift to care for one section. Submitted by W. E. Buell & Co.

Laurel, Marshall County, Population 195, January 2, 1923. Plans and specifications for complete water and sewer systems. Water system includes well, pumps, pump house, distribution system and 50,000 gallons elevated steel tank.

Sewer system includes collection system, Imhoff tank and trickling filters. Plans submitted by Buell Engineering Co. of Sioux City.

Le Grande, Marshall County, Population 320, May 22d, 1923. Plans and specifications for water works system as submitted by W. E. Buell and Co., of Sioux City. Plans provided for 300 foot well, pump house and deep well pump, and 30,000 gallon storage tank.

Low Moor, Clinton County, Population 277, June 28th, 1924. Plans and specifications for new waterworks system, including new well and distribution system, as submitted by J. G. Thorne of Clinton.

Marquette, Clayton County, Population 575, March 19th, 1923. Temporary approval of plans and specifications for sewer system without treatment plant. Submitted by W. E. Buell & Co., of Sioux City.

Marshalltown, Marshall County, Population 15,731, June 9th, 1924. Plans and specifications for low lift pumping station and equipment as addition to Marshalltown water system, as submitted by A. T. Luce, Gen. Mgr.

Maurice, Sioux County, Population 329, January 15th, 1923. Plans and specifications for complete water and sewer systems as submitted by Buell Engineering Co., of Sioux City. Water system includes well, pumping machinery, pump house, distributing system and 30,000 gallon steel tank. Sewer system includes collection system, Imhoff tank and trickling filters.

Mechanicsville, Cedar County, Population 812, February 23d, 1923. Plans and specifications for complete sewer system. Treatment plant consists of Imhoff tank, dosing chamber, stone trickling filter and sludge bed. Submitted by Currie Engineering Co. of Webster City.

Meridan, Cherokee County, Population 218, April 6th, 1923. Plans and specifications for water works system, providing well, pump, mains and 30,000 gallon tank. Prepared by W. E. Buell and Co.

Morning Sun, Louisa County, Population 751, July 3d, 1923. Plans and specifications for new well to be from 500 to 1,200 feet deep, as submitted by Currie Engineering Co.

Muscatine, Muscatine County, Population 16,068, September 19th, 1922. Plans and specifications for sanitary sewer to serve district of approximately 6,000 people, in south Muscatine. No treatment plant is provided but provision made for such an installation in the future. Sewage is brought to one central pumping station from which it is pumped over the levy into the Mississippi river.

New Vienne, Dubuque County, Population 241, August 18th, 1922. Plans and specifications for complete sewer system as prepared by H. R. Green. Plans provide for the sewering of the entire town in one district. Sewerage treatment plant consists of shallow septic tank, siphon chamber, intermittent sand filters and emergency lift.

Norway, Benton County, Population 463, April 16th, 1923. Plans and specifications for sanitary sewer system complete. Sewage treatment plant consists of Imhoff tank and trickling filters.

Oakdale Sanitarium, Johnson County, September 4th, 1923. Plans and specifications for sewerage treatment plant, as prepared by Lafayette Higgins and Son, consisting of Imhoff tank and trickling filter.

Oakland, Pottawattamie County, Population 1,188, April 27th, 1923. Plans and specifications for water works improvements as submitted by C. H. Currie and Co. Plans provide for new pump house, centrifugal pump and 150,000 gallon storage reservoir.

Oakland, Pottawattamie County, Population 1,188, July 18th, 1923. Plans for sewer extensions on Center street between Willow and Lincoln streets, Willow street between Center and Kearns street, E. Kearns street, between Palmer and Willow streets, and branch crossing R. R. tracks. Also branch on Palmer street. Submitted by Currie Engineering Co.

Odebolt, Sac County, Population 1,445, June 11th, 1923. Improvements to sewage treatment plant providing sludge digestion chamber and sand filters. Submitted by W. E. Buell and Co.

Oelwein, Fayette County, Population 7,455, July 30th, 1923. Plans and specifications for sewering the lower part of the city located in District No. 10. Sewage is led to a collecting sump from which it is pumped south two blocks to a regular sanitary sewer system. Submitted by E. B. Tourtellot, city engineer.

Oelwein, Fayette County, Population 7,455, August 6th, 1923. Plans and specifictions for sewage treatment plant including pump station, double Imhoff tank, and sludge bed. Submitted by Currie Engineering Co.

Oskaloosa, Mahaska County, Population 10,485, March 21st, 1923. Plans and specifications for proposed 8-inch sanitary sewer extensions as prepared by Don. B. Russell, city engineer, on Sixth Ave. West between South D. street and M. & St. L. R. R.

Oskaloosa, Mahaska County, Population 9,427, April 12th, 1923. Plans for sewer extensions on S. 11th St., 2d Ave. between S. 9th and S. 11th and 3d Ave. between S. 9th and S. 11th. Prepared by Don B. Russell, city engineer.

Oskaloosa, Mahaska County, Population 9,427, May 31st, 1923. Plans and specifications for water purification plant as submitted by Brown and Cook of Ottumwa. River water is to be aerated, passed through two rapid sand filters and into open reservoir. Lime and alum to be used as coagulant. Liquid chlorine to be added to filtered water.

Ossian, Winneshiek County, Population 853, March 19th, 1923. Plans and specifications for complete sewer system providing that the town be sewered in four districts. Each of four sewage treatment plants consist of Cameron tank, dosing chamber and intermittent sand filter. Submitted by H. R. Green of Cedar Rapids.

Sergeant Bluffs, Woodbury County, Population 548, May 31st, 1923. Plans and specifications for complete water system as submitted by W. E. Buell and Co., providing for 300-foot well, deep well pump, pump house, mains and either steel or concrete tank.

Shell Rock, Butler County, Population 815, August 27th, 1923. Plans and specifications for sewer extension on Prairie and Adair streets, as submitted by Ralph B. Slippy Engr. Co. of Waterloo.

Sibley, Osceola County, Population 1,803, November 8th, 1922. Plans and specifications for three new wells, pump house, centrifugal pumps and 4-inch and 6-inch connections as submitted by J. J. Shoemaker.

Sidney, Fremont County, Population 1,154, November 9th, 1922. Plans and specifications for sanitary sewer system for school and court houses. Treatment plant consists of septic tank, dosing chamber and sand beds.

Storm Lake, Buena Vista County, Population 3,658, June 9th, 1924. Conditional approval of plans and specifications for addition to water purification plant as submitted by V. Flindt. Plans provide for additional sedimentation and filters. Objection based on lack of detail design for filters and piping, vertical flow in sedimentation chamber and dosing of coagulant.

Sutherland, O'Brien County, Population 876, February 14th, 1923. Plans and specifications for complete sanitary sewer system including collection system, Imhoff tank, dosing chamber, stone filters and sludge bed. Submitted by W. E. Buell and Company of Sioux City.

Sutherland, O'Brien County, Population 876, February 14th, 1923. Plans and specifications for water extensions and steel, elevated storage and pressure reservoir, as submitted by W. E. Buell & Company of Sioux City.

University Park, Mahaska County, Population 361, June 18th, 1923. Plans and specifications for sanitary sewer system providing that the town be sewered in either one or two districts with Imhoff tank and trickling filter. Submitted by W. E. Buell & Co.

Van Horne, Benton County, Population 524, January 24th, 1923. Plans and specifications for complete water system including air lift pump, pump house, 4-inch and 6-inch pipe and 50,000 gallon steel tank, as submitted by H. R. Green of Cedar Rapids.

Walnut, Pottawattamie County, Population 1,072, February 14th, 1923. Plans and specifications for complete sanitary sewer system including Imhoff tank, design of both sand and stone filters with proper dosing chambers, and sludge bed. Submitted by W. E. Buell and Co. of Sioux City.

Washington, Washington County, Population 4,697, June 26th, 1923. Plans for sewer extensions and sewage treatment plant. Treatment plant consists of three chambered Imhoff tank and trickling filter and grit chamber. Submitted by W. E. Buell & Co.

Washington, Washington County, Population 4,697, October 28th, 1923. Specifications for well, 1,900 feet deep, as submitted by Arthur L. Mullergren of Kansas City, Mo.

Washington County Home, April 12th, 1924. Plans and specifications for sewage treatment plant including small tank of the Imhoff type, and stone trickling filters. W. P. Rawn, engineer.

Washington, Washington County, Population 4,697, April 12th, 1924. Plans and specifications for sewage treatment consists of Imhoff tank and stone trickling filters. Designed by W. P. Rawn.

Waterloo, Black Hawk County, Population 36,230, November 24th, 1922. Plans for sewer extensions on Maryland and Logan streets.

Waterloo, Black Hawk County, Population 36,230, March 20th, 1923. Plans for proposed sanitary sewer extensions as prepared by city engineer, R. B. Slippy, on Bertch between Denver and Kimball, Kimball between Bertch and Mitchell, Kimball north of Bertch 180 feet, Forest between Dry Run sewer and West 9th, Denver between W. 2nd and Sullivan, Baltimore between Euclid and Cornwall, Prospect between Berkshire Road and city limits, Columbia from Conger extending 200 feet north, and Glenwood between Linden and Steely.

Waterloo, Black Hawk County, Population 36,230, July 27th, 1923. Plans for sewer extensions on Monson, Columbia, Parker, Ricker, Peek, Newell Charles, Newton, Ashland, John, Polk and Miller streets. Submitted by R. B. Slippy, city engineer.

Waucoma, Fayette County, Population 457, August 17th, 1922. Plans and specifications for complete water works system prepared by Buell Engineering Co. Plans provide for pump, pump house, water mains to cover entire town, and 40,000 gallon steel, pressure tank. Water is to be supplied by either dug or drilled well, located in the western part of the town.

Waukon, Allamakee County, Population 2,359, October 7th, 1922. Plans and specifications for filter unit of sewage treatment plant, submitted by Tshirgi, engineers of Cedar Rapids. Filter consists of dosing chamber and stone trickling filter.

Wayland, Henry County, Population 637, June 25th, 1923. Plans and specifications for water works system including 2 wells, pump house and pumping equipment and 30,000 gallon steel elevated tank. Submitted by W. E. Buell & Co.

West Union, Fayette County, Population 1,777, June 2d, 1924. Plans and specifications for sewage treatment plant including Imhoff tank and sand filters. Submitted by W. E. Buell & Co. of Sioux City.

What Cheer, Keokuk County, Population, 1,626, April 11th, 1923. Plans and

specifications for impounding reservoir and water purification plant as prepared by Brown and Cook of Ottumwa.

Y. W. C. A. Camp at Okoboji, January 22, 1923. Plans for sewage disposal plant consisting of one-story tank and underground filter system, as submitted by L. Higgins of Des Moines.

PROTECTION OF PUBLIC WATER SUPPLIES

There are approximately five hundred cities and towns in the State of Iowa that have public water work systems. There still remains approximately four hundred incorporated towns that have no public water supply. The word approximately is used because this division has never been able to compile an exact record of the various public supplies. It is estimated that at the present rate of making sanitary surveys of public water supplies it would take ten years to visit every one in the State. It can readily be seen why no exact data can be compiled.

Sanitary surveys of public water supplies have been made at the request of local boards of health, as fast as they could be taken care of. Such surveys consist of going over a system carefully to detect the sanitary defects which might possibly permit surface contamination to enter the public system. Sanitary defects exist in many various forms and it often requires the eye of an expert to locate them. Many councils are inclined to underestimate a water analysis report and to believe steadfastly that their town public water supply could not possibly be contaminated. They fail to see the defects or realize the dangers until pointed out and fully explained by the surveyor.

It is the policy of the Division to first make a careful survey of the water system and to point out all defects. Then a conference is generally held with the council for the purpose of reporting the results of the survey. Conclusions are clearly set forth as to the sources of pollution and the degre of danger to which the town is subjected. The recommendations generally contain the improvements or corrections which are considered necessary for the safeguarding of the supply.

During this biennial period, the following towns requested a sanitary survey for the purpose of checking their sanitary water supplies, and detailed reports of each survey are on file in the State Board of Health office.

Ackley
Adel
Akron
Albia
Altoona
Anita
Aurelia
Avoca
Bedford
Belle Plaine
Bellevue
Bennett
Bloomfield
Bode
Boyden
Brooklyn
Cascade
Charter Oak
Clarksville
Corning
Corydon
Cresco
Dayton
DeWitt
Dexter
Doon
Exline
Galva
Harlan
Hawarden
Humeston
Ida Grove
Indianola
Iowa Falls
Jefferson
Keystone
Kingsly
Knoxville
Ladora
LeClaire
Lehigh
LeMars
Linden
Low Moor
Manning
Marne
Maurice
Maynard

Mediapolis
Miles
Milford
Minden
Montour
Morning Sun
New Hartford
Nora Springs
Norway
Onawa
Oto
Paullina
Prescott
Protivin
Radcliffe
Randolph
Ricketts
Rockwell
Schaller
Shelisburg
Sigourney
Sioux Rapids
Spencer
Stanton
Stuart
Terrill
Union
Wapello
Webster City
West Union
What Cheer

SEWERAGE AND SEWAGE TREATMENT

At the time the State Department of Health was first organized, there were, according to information received, two municipal sewage treatment plants in the state, while today there are approximately two hundred. The first plants put into operation were of the more shallow Cameron type of tank. This type of tank is still being built and giving successful results but experience has taught that they give better results when built deeper. In later years the Imhoff tank has become very popular and about ninety percent of the new tanks being installed are of this type. The various filters used in the past are the sand filters, contact beds, and stone trickling filters. The intermittent sand filters were for years the most popular and most widely used and even today they are used extensively. The stone trickling filters are being used more and more and have an advantage over the sand beds where there is the least danger of overflow, because the stone beds are not harmed to such a great extent. Practically all of the more recent plans being submitted to the State Board of Health for approval provide for Imhoff tanks with either intermittent sand or stone trickling filters, their respective dosing chambers, and sludge beds. There are still some Cameron tanks being designed and installed, but we have completely gotten away from the flat concrete slab covers and are covering the tanks with some sort of superstructure, which makes operation much easier.

Since the State Department of Health by law is charged with the supervision of the general health conditions of the state, it is evident that one of the main duties is to see that the sewage treatment plants are kept in good shape and made to give as great a degree of purification as possible. It has been impossible to even attempt to keep a check on all of these treatment plants in the State, and we have visited only those where a complaint had been filed on the nuisance as caused by the improper care of the plant or where the local officials had requested assistance in overcoming some difficulty encountered in the operation.

Our conclusion, from the plants we have been able to visit, is that about one plant out of five is given the care it should have and that the other four plants are allowed to care for themselves. Thus, the purpose for which the plants were built is defeated, and the thousands of dollars invested therein has been, more or less, wasted.

During this biennial period, the following towns requested a sanitary survey for the purpose of checking the installation and operation of sewerage and sewage treatment plants, and detailed reports of each survey are on file in the State Board of Health office.

Ames
Anamosa
Arnolds Park
Brandon
Corning
Cresco
Dallas County
Dysart
Exira
Grinnell
Hartly
Hawkeye
Inwood
Iowa City
Lake City
LaPorte City
Lake View
Mapleton
New Sharon
New Vienna
North English
Odebolt
Oelwein
Osage

Osceola	Spirit Lake	University Park
Riverside	Stuart	Washington
Sioux Center	Tipton	Waukon
Spencer	Toledo	Wilton Junction

GARBAGE COLLECTION AND DISPOSAL

The proper collection and disposal of garbage is a phase of sanitation which in Iowa, has not received the attention it deserves and demands.

It is a general practice in our small towns, to feed the kitchen wastes to chickens and hogs kept inside the city limits and some people in these towns keep chickens for no other reason than that they provide means for the disposal of their garbage. There are very few, if any, cities or towns in Iowa with a population of less than 5,000, which attempt any systematic collection and disposal of garbage, and there are a good many cities with greater population than 5,000, which leave the problem of garbage disposal to the individuals.

There are a number of our larger cities, which have an efficient and effective garbage system. It is almost a universal rule that the garbage is stored in metallic cans from where it is collected by the city and disposed of. Disposal is made in various different ways, by incineration, burying, feeding, and filling.

From strictly a sanitary standpoint, the most satisfactory of these is incineration. This is not always the most economical however. The burying of garbage is satisfactory in some cases and it is being done by one of our largest cities. Feeding to hogs is a more difficult matter, if stringent sanitary regulations are enforced. In some cases where the piggery is satisfactorily located and cared for, this method can be practiced and is very economical. The disposal of garbage as a sanitary fill can be practiced in low, remote spots, if the organic matter is immediately covered with inorganic matter such as ashes or dirt.

This department has assisted some of our cities in working out their garbage problems by helping to map out suitable collection systems and determining upon the best method for disposal in particular cases, and we hope to be able to give this phase of sanitation more attention in the future.

During this biennial period, the following towns requested sanitary surveys for the purpose of investigating relative to the methods of garbage disposal and collections, and detailed reports of each survey are on file in the State Board of Health office.

Boone	Elkport	Ottumwa
Boyden	Ft. Dodge	Valley Junction
Cedar Rapids	Ft. Madison	Webster City
Council Bluffs	Iowa City	Winterset

NUISANCES

Under this classification, we are grouping the reports of all investigations, which do not rightfully come under any other classification.

The request for investigations as received by this department are of all natures. Some letters are received calling attention to bad conditions, which letters are not even signed. These letters are merely placed on file, and if no further information is received they are ignored entirely. Many letters are received yearly calling attention to the sanitary conditions of an alley or a neighboring barn yard. All such letters are courteously answered, taking care to instruct the complainant to first take the matter up with the local Board of Health. The complaining parties are also instructed to the effect that if they cannot secure relief through their local boards of health, they can file complaint with the State Department of Health provided

it is in the form of a petition signed by five citizens of this community.

Upon receipt of a properly signed petition, this Division makes a survey of the conditions complained of, and advises with the complaining parties and the local board of health concerning the nature of the nuisance and the proper method of abatement. The State Department of Health has not been vested with police powers for abating small local nuisances, and the surveys which are made merely tend to bring about an understanding and a fair decision. Moral support and advice is given all local boards of health and a written report is often made, which the local officials are able to use for causing certain nuisances to be abated, without creating unpleasant personal feeling, which has a tendency to affect their local business.

During this biennial period, the following towns requested a sanitary survey for the purpose of investigating nuisances reported, requiring the services of a sanitary engineer to local communities, and detailed reports of each survey are on file in the State Board of Health office.

Adel	Garden Grove	Quimby
Anamosa	Grinnell	Radcliffe
Calmar	Iowa City	Rockingham
Carroll	Lockridge	Rodney
Carson	Lorimor	Smithland
Columbus City	Mechanicsville	Springville
Dallas Center	Melcher	Stanwood
Davenport	Montrose	Stuart
DeSoto	New London	Swea City
Eldora	New Virginia	Taintor
Elkader	Ossian	Waucoma
Exira	Polk County	Winterset

CONTROL AND PREVENTION OF STREAM POLLUTION

After the 40th General Assembly placed the responsibility of preventing the use of the rivers of Iowa for the disposal of sewage and industrial wastes, the division of Sanitary Engineering made a number of preliminary surveys of a portion of five different rivers. Such preliminary surveys have consisted merely of visiting various communities to determine whether or not sewage or industrial wastes were actually discharged into the river at that particular point.

A proper sanitary survey of a river would consist of gathering a great deal of information regarding a stream flow, variations of depth, and maximum and minimum dilutions. It would further determine the nature of the different wastes from different sources and estimate the quantity and concentration. Laboratory tests should be made to measure the pollution of a stream at the different seasons and then when all of this work is done and the information compiled, it would be possible to intelligently determine just what degree of purification is necessary to prevent the pollution of the stream at different places.

The State Department of Health has held several hearings the past year for the purpose of preventing stream pollution but because of the lack of scientific data, it was necessary to go at it in a blind way. After these hearings, a number of cities and industries were asked to prepare plans and specifications of sewage treatment plants, but it was impossible to state any particular type of plant or require any particular degree of purification. It is not justified to demand perfect purification in many instances, and even if it were justified, the department would have no way of determining whether the treatment plant that had been installed would produce a staple effluent.

The Division of Engineering has requested field equipment and men in its proposed budget, for 1925 and 1926, in order that stream pollution work might be carried on in an intelligent, scientific way. If this budget is denied, the division can only hope to carry on in a very limited way, until public sentiment demands action in such

language as to forcibly bring our needs to the attention of the State Legislature.

Lime Creek

Prior to July, 1922, a number of surveys had been made on Lime creek, which flows through Mason City and empties into the Shell Rock river, to determine the source of pollution that was foully corrupting the waters of that creek.

On March 31, 1923, a conference was held in Mason City with Professor Bartow of Iowa City, and Mr. Decker of the J. W. Decker Packing Company to discuss the limitation of their treatment plant and to talk over the improvements and additions which would increase the efficiency of the plant.

Waste waters from the packing plant had been treated in an activated slug plant. The effluent from this treatment plant was not staple, and the waters of the river below the packing industry showed evidence of pollution. It was decided at this conference that the treatment plant was too small to take care of the increased kill of the plant and that it would be necessary to double the size in order to secure satisfactory clarification.

On November 6, 1923, a visit was paid the Northern Sugar Corporation to determine the results obtained from their new treatment plant. For several past years, the waste from the Northern Sugar Corporation had been blamed for causing a great many fish to die in Lime creek, and the Shell Rock river as far down as the city of Greene. The banks of the river had been traversed between Greene and Mason City the winter before, and it had been concluded that the Sugar Corporation was playing a large part in polluting the rivers and they had been requested by this department to install a treatment plant.

During the summer of 1922, a large tract of land had been converted into a series of impounding reservoirs into which all the wastes were pumped. The pulp wastes were to be pumped into an upper basin where it was to flow by gravity through three lower basins. As the effluent passed from one basin to the next, it was made to flow over a spillway, which was for the purpose of aeration. The Steffins wastes were pumped into a reservoir and the lime wastes were also pumped into a reservoir by itself. The visit on this date was made primarily to see this plant in operation and to get some idea as to the efficiency.

Along about the latter part of January, it was again reported that many fish were dying along the Shell Rock river below Mason City. In order to start a movement for the cleaning up of Lime creek, the sanitary engineer was ordered to proceed to the city of Greene on February 1, 1924, to attend an open conference between the public and the representatives of the Northern Sugar Corporation and the Decker Packing Company from Mason City. After a full day, in which all the various ideas to the problem had been discussed, the meeting adjourned with very little accomplished. This meeting could not be considered a hearing as provided by the stream pollution law, for the reason that the Board was not present and the minutes of the meeting had not been kept.

As a result of the meeting held in Greene, the State Department of Health called a regular hearing on March 13th and 14th in its offices in Des Moines for the purpose of hearing both sides of the problem of preventing the pollution of Lime creek. During this hearing a full score of residents along the Shell Rock river testified as to the serious condition of the river at the times when the fish die. The Northern Sugar Corporation and J. W. Decker Packing Company were given opportunity to present their side of the question. At the close of the hearing, the Department of Health issued orders to the Sugar Corporation to refrain from discharging any wastes into Lime creek that would be deleterious to fish life. This order was interpreted

to mean that the Sugar Corporation must either install a treatment plant or close down.

Following the hearing held by the Department of Health, February 13th and 14th, a visit was made to Mason City, accompanied with the chief of the Water Laboratories to confer with the Northern Sugar Corporation in regard to the type of treatment plant that would be required. It was agreed upon that various improvements should be made to increase the facilities for aeration and that the plant be enlarged in capacity. A number of suggestions were made, which would be carried out as far as experiments justified. It was hoped that a suitable treatment plant would be completed and put in operation for the 1925 campaign.

Upper Cedar River

Upon the receipt of two petitions signed by the citizens of St. Ansgar and Osage, a trip along the upper Cedar river was made by a representative of this department to determine the various sources of pollution that were causing the death of fish. On March 12, 1924, a trip was made along the river between Osage and the state line, accompanied by a number of men, who are interested in preservation of wild life. It was found, during this inspection trip, that the upper Cedar river contained a large quantity of waste matter that at places, could be detected by the odor. It was testified to, by various men, that during the winter months, when the river was completely frozen over, that large numbers of fish had died under the ice, and that the odors at various places could be smelled at a distance of a quarter of a mile away from the river. It was believed that the source of the pollution, which was causing this disturbance, was being discharged into the river at Austin, Minnesota.

In order to determine definitely just where the source of pollution was, and of what nature it consisted, the engineer received special permission to visit Austin, Minnesota, to meet the engineer of Minnesota and confer with the city officials in regards to preventing future pollution. This trip was made to Austin on June 10, 1924, and it was definitely determined that the city of Austin was discharging all of its wastes directly into the Cedar river and that the Hormall Packing Industry was also discharging its wastes directly into the stream.

At a conference that was held on the evening of June 10th with the city council of Austin and representatives from the packing plant, they were informed as to the conditions existing in the State of Iowa and that the people in the vicinity of St. Ansgar and Osage would not stand for the conditions very much longer. They were informed that if definite action was not taken to install suitable treatment plants, that definite action would be taken by the State of Iowa to prohibit the use of the Cedar river as a place for the disposal of sewage and industrial wastes.

On June 11, 1924, a survey was made on the Cedar river between Austin, Minnesota, and Osage, Iowa, by the engineer of Minnesota and a representatives of the United States Public Health Service, and a representative of this division. Samples of the river were collected at various points for the purpose of making the biochemical oxygen demand determinations to determine the true state of the river at that time. These determinations made in the field, showed conclusively that the river contained a large amount of organic matter and that it was all coming from the vicinity of Austin, Minnesota.

Following this survey, a report of the conditions was prepared by this division and presented to the State Board of Health. This report was referred to the legal department of the State, who were to take the matter up with the proper authorities of Minnesota to bring pressure to bear on the city and industries of Austin, compelling them to install suitable means of treatment as soon as possible.

Lower Cedar River

Upon the receipt of twelve or fifteen petitions, all properly signed by twenty-five or more signers, a preliminary survey was made of the Cedar river between Cedar Rapids and Nashua to determine all the various sources of pollution to the Cedar river.

A survey was made on June 24-25-26, 1924. At Cedar Rapids, a city having a population of 48,000, it was learned that all of the domestic sewage was discharged directly into the river. It was also learned that M. T. St. Clair Packing Company, the Penick and Ford factory, and the gas house were also discharging their industrial waste matter directly into the river. At Vinton, it was learned that the city, having a population of 3,500, a gas plant, and a corn canning factory were discharging wastes directly into the river. At LaPorte, it was learned, that a corn canning factory and an ice cream factory were discharging small amounts of wastes into the river. The city, itself, has a Cameron tank by way of the sewage treatment plant. At Waterloo, it was learned that the entire city, having a population of 38,000, the Rath Packing Company, the gas house, and a corn canning factory were discharging all of their wastes directly into the river. At Cedar Falls, it was learned that both the city creamery and a canning company were discharging directly into the river. At Waverly, it was learned that the city, a canning company, the gas house and a milk evaporating plant were discharging wastes directly into the river. At Nashua, it was also learned that the city, creamery and woolen mills were discharging variable amounts of wastes directly into the river.

Upon the strength of this information, the State Department of Health called a hearing, which all the above mentioned parties were invited to attend. This hearing was conducted in accordance with the stream pollution law and was for the purpose of giving the various cities and industries opportunity to appear before the Board and present their side of the problem, if they had any. This hearing was held in July, 1924, and resulted in the Board ordering all the various cities and industries to draw up proper plans and specifications for treatment plants and to present them as soon as possible to the State Division of Engineering for approval.

Iowa River, at Iowa Falls

Pursuant to the receipt of a request for investigation from the Iowa Falls Community Club and from the State Fish and Game Department, a representative of this department made a survey to determine the possible sources of pollution to the Iowa river at this point, on August 3, 1922.

Iowa Falls is a city with a population of 3,954 and the sewage of the city is dicharged into the river without any treatment whatever. Evidences of this sewage pollution could be seen very plainly for some distance below the point of discharge. Below the main part of the city, there is a small stream tributory to the river and into which several sources of pollution are being discharged. The effluent from a small septic tank, located on the east side of this stream and south of the Rock Island tracks, which it was learned serves a school house, discharged into the stream without passing through any sort of filter system. The wastes from the gas company, in form of a tar water, were not treated before being discharged into this small stream. The Shannon & Sons Produce Company was not in operation at the time of this investigation, but a large pile of refuse from a poultry house was maintained on the bank of the stream, where. at times of high water, some of it would be washed into the stream. The Swift & Company plant has a septic tank, which, it was understood, was designed for the sewer district of the town in which it is located. and into which the sewage of the employees was passed. There was no visible provision for cleaning this tank, and no filter system supplied for treating the effluent.

It was concluded that all of the above mentioned sources of pollution were contributory to causing a very unsanitary condition in this small stream and in the Iowa river. It was recommended that, in order to do away with the unsanitary condition then in existence, the following should be done: The sewage of the city should be passed through a suitable treatment plant. The effluent from the school house septic tank should be passed through suitable filters. The treatment plant of Swift & Company should be provided with a filter system and means for cleaning the tank, and should be properly cared for. The refuse from Shannon & Son Produce Co. should be removed and the practice of dumping in this place should be discontinued. The churn washings from Swift's and the wastes from the gas plant should be treated before being discharged.

Iowa River

On September 25, 1923, a trip was made up the Iowa river between Cedar Falls and Belmond to observe the conditions of the river. Several complaints had been received to the effect that industrial wastes from the sugar industry at Belmond had so polluted the Iowa river that it was destroying fish life. The survey proved that the city of Iowa Falls was discharging its wastes directly into the Iowa river. It was also learned during the survey, that the city of Belmond has an up-to-date sewage treatment plant, but that the sugar industry was discharging its wastes in an untreated form directly into the river. No dead fish were observed on this inspection trip and the waters from all appearances, seemed to be in a fairly good condition, although the mere fact that it looks all right is no criterion.

On November 6, 1923, a second visit was paid the sugar industry at Belmond for the purpose of finding out just how they were handling their wastes and what they were intending to do to prevent pollution of the Iowa river. It was learned that all of the lime wastes, which had formerly been discharged into the river, were now discharged into a series of sumps, where the lime would be permitted to settle out and the liquids to run off and disappear in the surrounding territory. The pulp waste from the factory was discharged into a large pit, into which the cinders from the plant were also dumped. The cinders acted as a filter medium and would remove some of the suspending matter, but there is no question but that the effluent, which discharged into the river was quite heavily laden with organic matter in solution.

The point of discharge was observed, and it was noted that a very riley condition existed for a quarter of a mile down stream. Below this, the dilution increased so that the effects of the wastes were entirely lost to the eye. There were no indications at the time of this inspection, that the fish would be interfered with.

Des Moines River

Inspections have been made from time to time, at various places along the Des Moines river to determine the sources of pollution that have been called to the attention of this department. On October 10, 1923, Ft. Dodge was visited for the purpose of determining where the quantity of oil that could be seen floating on the surface of the water, had its source. Investigation showed that the majority of the oil was due as a result of an accident. A great quantity of oil had been accidentally spilled while unloading near a small tributary near the Des Moines river and it was this oil that was seeping through the ground and getting into the water. It was also observed that a great quantity of oil was being discharged into the sanitary sewer system from the garages located in the city of Ft. Dodge.

On February 22, 1924, an investigation was made of the Des Moines river in regard to various sources of pollution upon the receipt of complaint. It was learned at this inspection, that the city of Ottumwa was discharging all its domestic wastes directly into the river. It

was also learned that the Morrell Packing Company was discharging its wastes into a city storm sewer and finds its way into the Des Moines river. During the survey, a complete inspection was made of the Morrell Packing Company to determine the methods used to prevent greases and bloods from entering the sewer and it was found that very little effort was made in preventing objectionable organic matter.

On March 7, 1924, a second visit was made to Ottumwa in order to confer with the city council relative to preventing the packing company from using the city sewer. During this visit, the river below Ottumwa was traversed for a good quarter of a mile, and it was noted that the wastes quickly disappeared, because of the large body of water for dilution. No bad effects could be discovered, and the pollution of the waters at this point was not considered serious. In a report to the Department of Health, the opinion was expressed that no intelligent results could be determined unless a complete sanitary survey was made, which included a considerable amount of field or laboratory work.

Big Sioux River

At the request of Mr. A. H. Weiters, the Sanitary Engineer of South Dakota, a member of this division accompanied him on September 4th and 5th in making a sanitary survey of the Big Sioux river between Hawarden and Sioux Falls, South Dakota. During the summer of 1923, the Department of Health of South Dakota had carried on an extensive sanitary survey of the Big Sioux river and were just in the process of completing this survey, when this trip up the Big Sioux river was made. The methods of how the survey had been conducted were pointed out, and the visible forms of pollution were noted.

The South Dakota authorities were endeavoring to show that the sewage of the city of Sioux Falls, together with the wastes of the various industries there, were grossly polluting the water of that river as far down as Hawarden and they were desirous of having the authorities of the State of Iowa to co-operate with them in cleaning up the river.

On April 15 and 16, 1924, a survey was made of the Big Sioux river to determine the progress that South Dakota had made in preventing pollution and to determine more definitely the amount of pollution that the cities of Iowa were contributing. It was learned that the city of Hawarden was discharging all of its wastes directly into the river. It was further learned that the town of Akron and all the rest of the small towns that have sewer systems located directly on the Big Sioux river were discharging wastes directly into that river. It was learned that the majority of cities having sewer systems located on the tributaries on the Big Sioux river in Iowa have proper sewage treatment plants excepting those located on the Floyd river, which discharges into the Missouri river at Sioux City.

The authorities at Hawarden were informed of the activities of the South Dakota authorities and were advised to begin making plans for the installation of a sewage treatment plant as the time was not so far off when they would probably be requested or ordered to do so by the Iowa State Board of Health.

Little Sioux, at Cherokee

Pursuant to a complaint from Cherokee, forwarded to this office from the State Fish and Game Department, a representative of this department made a preliminary survey of the Little Sioux river at Cherokee to determine the various wastes which were being passed into the river at this point. This survey was made on March 26, 1924.

At the time of the investigation, the river was flowing almost bank full which is considerable higher than normal stage and on this account the conditions were not acute. The various wastes as discharged into the Little Sioux river in the near vicinity of Cherokee are:

Sanitary sewage from the State hospital which has about 1,500 patients, a waste water from the softening plant as maintained by the I. C. Railway Co., gas plant wastes from the Cherokee Gas Plant, laundry wastes from the Cherokee Laundry, and the combined sewage as discharged into the river through the city sewer system.

The conclusions drawn from the survey and the testimony of the citizens were that the conditions were not really acute at that time but were gradually becoming worse and worse and some precautionary steps should be taken.

Mississippi, at Clinton

On June 21, 1923, an inspection was made of the Mississippi river directly below Clinton as a result of a number of complaints, which had been received from communities located along the Mississippi river, between Clinton and Davenport. An inspection was made of the refining company's plant to determine the nature of its waste product and to observe the methods used in removing the organic matter that was not used. Observations disclosed no great amount of organic matters in suspension, but it is quite probable that the waste waters contained a high organic content in solution. It is doubtful, however, that this waste would have any appreciable effect on the Mississippi. It was the opinion of the department, that it would require a more extensive and detailed survey to come to any definite conclusions as to the character of the pollution.

TOURIST CAMPS IN IOWA

Only a few years ago the expression "tourist camps in Iowa" was unknown, but today every community of any size, and especially those located on the primary roads, boasts of a tourist camp. These communities maintain these camps for the purpose of drawing the trade of the people touring in automobiles, and it seems that it is a type of advertising which is on a competitive basis. Each community tries to outdo its neighbor in supplying the tourists with all the comforts of home.

In visiting a number of these tourist camps it has been observed that the features which have been given the most attention, in locating and maintaining the camps, are those which add to the attractiveness, which of course, are the ones that appeal to the ordinary tourist and it is only the natural thing. Oftentimes the prettiest spot in the community is turned into a tourists' camp. Stoves, fine rest rooms, play grounds, pools for swimming, and other comforts are provided while a good, safe drinking water supply, suitable means for removing and disposing of the garbage, and other features which are contributory to the health, and thus the happiness, of the tourists, are given secondary consideration.

It cannot be too strongly emphasized that although a community has the tourists' camp for the accommodation of the tourists and furnishes it free of charge, at the same time these tourists stop and camp in the community upon invitation and their safeguard from preventable disease is a responsibility of the community.

The Iowa State Department of Health realizes the growing need for a close supervision over these camps. It has adopted a simple set of rules covering the sanitation of tourists' camps and desires the co-operation of every community in making and keeping Iowa's tourists' camps in the best sanitary condition, but on account of the incapability of this department to make the much needed surveys of tourists' camps along with its other work, very few of these surveys have been made during the past biennial period.

Carroll

In passing through the city of Carroll, a town with a population of 4,254, a representative of this department made an inspection of the tourists' camp on July 25, 1923. It was located on rather a flat area,

about six blocks to the northeast of the business district. The source of water supply was city water, such being considered as satisfactory. Outdoor toilets were provided, which could be improved to some extent. One rather unusual feature of this camp was the play ground equipment, which was provided.

Clear Lake

Pursuant to the receipt of complaints on the condition of tourists' camp at Clear Lake, an investigation was made by a representative of this department on August 9, 1923.

The camp is located along a main highway in the south part of the city and covering a space equal to about one square block. The water was supplied by a well equipped with a common hand pump. The toilet was the type known as the common "outdoor toilet," having a comparatively open wood pit and frame structure. Garbage cans were supplied for the storage of garbage, but at the time of inspection, they were filled to overflowing and no covers were to be found on any of them.

The Local Board of Health was requested to put into effect a better garbage collecting system, to have the water from the well analyzed periodically and to keep the camp in a better general sanitary condition.

Camp Hantesa, near Boone

On July 24, 1923, information was received by the engineering division that a number of Des Moines girls that had attended the Campfire Girls' summer camp that is located at The Ledges near Boone had been taken down with typhoid fever soon after returning from the camp. A visit was immediately paid to this summer camp for the purpose of locating the possible source of the typhoid and to prevent further cases if possible.

The camp is located in an ideal spot in a region known as The Ledges along the Des Moines river below the city of Boone. An inspection of the camp proved it to be in very good condition. The methods of the disposal of garbage and night soils were considered very satisfactory and no danger could be traced from this source. Further inquiry shows that all the vegetables used in the camp had been purchased in the city of Boone from regular distributors, and no particular danger could be suspected or traced from this source. Most of the milk used in the camp was of the evaporated kind which came in cans. A little milk was furnished by a neighboring farmer but careful investigation showed that none of the girls that had been taken with typhoid had ever drank any of this milk.

The girls had been in the camp a full two weeks prior to their taking typhoid fever and had not left the camp at any time during this visit. As it was quite evident that the typhoid had been contracted while in this camp further investigation was carried on with the hope of determining the source. It was learned that the girls were permitted to go in bathing in the Des Moines river near the camp. The chosen bathing place is located about three miles below the sanitary sewer outlet which discharges all the sewage from the city of Boone into the river. Careful inspection shows evidence of sewage and a thick coat of black sludge all over the bottom of the river. It was considered highly probable that the girls while in bathing had thoughtlessly permitted some of the polluted river water to enter their mouths, and as there is no question but what the river at this point is heavily loaded with all manner of pathogenic germs, that it was here where the girls contracted typhoid fever.

This division advised that bathing at this place be prohibited until the girls could be given instruction as how to guard against typhoid fever. It was advised that the bathers be warned against taking any water into their mouths, and that all be compelled to take a bath in clean water after they had emerged from the river. It was

realized by this division that a great deal of the sport in attending the camp would be entirely destroyed if the girls were not permitted to go in swimming, so it was advised that the camp be located on a more favorable location in future years where good, safe bathing could be assured.

GENERAL SANITATION

A few investigations have been made during the past biennium in communities where there are no public water supplies and sanitary sewer systems, or where the public water supply was endangered, not by one particular condition, but by the general unsanitary conditions of the community. In most of these cases, it will be seen that our conclusion as to the only satisfactory means of overcoming such unsatisfactory conditions, was the installation of proper systems for supplying a safe supply of water and proper means for the disposal of the community wastes.

These investigations should not be confused with proper and complete sanitary surveys, because in these cases, we have been unable to spend the required time, and have not had the equipment to make the determinations, which we believe constitute a proper sanitary survey.

Albia

Albia is a city with a population of 5,067 and at the time of this investigation, January 30, 1924, was constructing a dam for the purpose of impounding water to be treated for public water supply. Prior to this installation, Albia had had no public water supply which was fit for human consumption. Work on the construction of this dam and plant was just getting well under way.

In visiting the sewage treatment plants of the town, it was found that they were not being given the best of care and were in general poor shape. Their proper care and operation was urged.

Allerton

Pursuant to the request of the local health officer, a general sanitary survey was made of the town of Allerton, having a population of 954, on September 6, 1923.

Upon investigation, it was found that the city was supplied neither with a public water system nor a sanitary sewer system. The water for the community was supplied by two town wells located on the main street and by private wells, most of which have comparatively open tops and located very undesirably.

The wastes of the community were cared for in various ways. A great many open pit privies were used, which were a disgrace to the community as well as a great harbor for rats and flies. Some of the modernly equipped homes discharged their wastes into old wells or other open pits from which the seepage could probably find its way into water bearing strata and thus into wells which were being used. Other homes were equipped with septic tanks and the effluent drained into some tile drain leading to a dry run. It was found that some drains, which were known to be carrying the effluent from septic tanks were not passing any water at the outlet, indicating that the drain lines were stopped up and the sewage material escaping, by seepage, into the soil.

The sanitary conditions, as a whole, were considered very unsatisfactory and many well supplies were thought to be really dangerous. The importance of enforcing better sanitation was emphasized and the installation of a public water system for supplying ample and safe drinking water and a sanitary sewer system for properly caring for the wastes of the community was urged.

Earlville

The officers of the town of Earlville requested that a representative of this department go over the existing conditions and such a survey was made on July 12, 1923.

Earlville is a town with a population of 619, has a public water system, but is not equipped with a sanitary sewer system. The modern homes of the town pass their sewage into cesspools or septic tanks, the drains from which led into a drain tile as maintained by the town, and which discharged within the city limits. Advice against the extension of this already improperly constructed sewer line was given, the necessity for a proper sanitary sewer system was emphasized, and action towards such an installation urged.

Lohrville

Lorhville is a town having a population of 727. The water is supplied by one deep well 180 feet in depth and located about one block east of the main street. The water is pumped directly into a sixty thousand gallon steel tank and distribution system. The general location is considered as most desirable, and it is believed that as long as the well casing is in good shape, the water will be fairly satisfactory.

The sewage treatment plant consisted of Imhoff tanks, dosing chambers, sand beds, and sludge bed. At the time of this investigation, July 25, 1923, this plant was in good condition.

At this time the town did not have a tourists' camp, but one was anticipated.

New Market

On October 2, 1922, pursuant to the receipt of complaints, an investigation was made of the sanitary conditions in the town of New Market. The town of New Market had a population of about 800 people and seemed to be rather a prosperous community, but no investment had been made for the protection of their health in the way of improvements for furnishing good, safe drinking water and disposing of their domestic wastes in a satisfactory manner. The water was supplied by various private wells, the location of which seemed to be very dangerous in a number of cases and the quality of the water was unknown. Some of the modern homes discharged their wastes through the septic tanks or cesspools and the passing of the effluent into dry runs or surface ditches caused nuisances. Piles of garbage were seen in the streets and alleys and no proper means for the collection or disposal of same had been provided.

It was earnestly and strongly recommended that the city officials take sufficient interest in the health and welfare of this community to cause a general cleaning up of the town. It was advised that the only satisfactory and permanent way to accomplish this was by the installation of a public water supply and sanitary sewer system and by maintaining a proper garbage collection and disposal system.

Promise City

Promise City is a town with a population of 267 and at the request of the mayor, a survey was made to determine the proper steps for abating certain unsanitary conditions and lending assistance to the local Board in accomplishing this, on October 4, 1922.

It was found that the conditions were very similar to many of our smaller Iowa towns, there being no public water supply or sanitary sewer system and in many cases the private water supplies were located dangerously close to some source of pollution.

It was advised and urged that the city council cause a general cleaning up of the community and have the water from a number of the wells analyzed to determine its true quality. It was also urged that the city launch upon some program to see if it would not be possible to install a water system serving the whole community with one supply, which could be easily safeguarded.

Riverside

At the request of the mayor, an investigation was made of insanitary conditions in existence in the town of Riverside on September 13, 1923.

Riverside is a town with a population of 667 and is equipped with a sanitary sewer system. Very few connections to this system have been made, however, and general filthy conditions prevail over the town. Numerous poorly constructed, poorly kept toilets were being maintained and in many places garbage was being dumped on the ground in the business section of the town.

The local Board of Health was advised that sewer connections should be made compulsory by the local Board of Health, that garbage be stored in tight, metallic cans, and a general cleaning up effected.

Sheldon

When making a train connection in Sheldon on July 14, 1922, a representative of this department made an inspection of the city water supply and sewage treatment plant.

The water is supplied by six sand points to a depth of 20 feet, located about one-half mile north of town near a small creek. The water is first pumped into an old dug well, cemented up, which serves as a reservoir. From here it is pumped into the distribution system, which includes a 200,000 gallon steel stand pipe.

The sewage treatment plant consisted of a Cameron tank, dosing chamber, and sand filters. At the time of investigation, the tank was in fairly good condition, but the beds were badly in need of attention, and were being bypassed.

Stratford

Stratford is a town with a population of 694, and following the receipt of a request that this department make a survey of the public water supply, a representative visited Stratford on June 20, 1923, made a survey of the public water supply and also of the sewage treatment plant.

One well, 500 feet in depth, located about one-half block from the district, supplies the water for the public system of the town. The casing was only two years old and thus should be in good shape. The connection of the pump to the top of the casing was satisfactory. The general location, however, was only fair and the removal of nearby toilets was recommended.

Sewage treatment plant consisted of slab covered Cameron tank, dosing chamber, stone trickling filter, and secondary settling tank. The plant was in a very bad stage or dilapidation and lacked evidence of any care whatsoever. The tank was badly in need of cleaning and the filters were in terrible shape. There was not over half the depth of stone that there should have been on the filter, and it was said that the full amount of stone never had been placed thereon. About one-half of the nozzles were missing completely and it was considered that the filter in this condition was worthless. The city council was urged to put the plant back into shape and to give it the proper attention.

Ute

On January 29, 1923, upon the receipt of several complaints, a representative of this department made a survey of the general sanitary conditions of Ute, a town with a population of 580. The water for the public water system is supplied by sand points driven to a depth of about 60 feet. These points are located about one block south of the main business section of the town and on the main drainage axis from this section. Directly behind the pump house was a concrete reservoir for the storage of crude oil for the power company and within about 50 feet of the pump house were two outdoor toilets. The water was pumped into the distribution system by a triplex pump which was set in a pit about 18 feet deep. In this pit was a foot or two of oily, greasy water with no signs of any means for the drainage of the pit. It looked as if the pump had been greased by throwing oil onto it out of a bucket. It was recommended that some sort of pump should be installed for removing the water from the pump pit,

that nearby outdoor toilets be removed and sewer connections made and that regular analysis be made of the water to determine any change in its quality.

Upon investigation, it was found that the sewage treatment plant was well locked against all possible trespassers including the town officials and the representative of this department, so just what the town had in the way of a sewage treatment plant, remains more or less of a mystery. In looking over the records in the archives of this department, no record of any approval for a sewer system or sewage treatment plant for Ute was found. If this town had taken advantage of the approval of plans by this department, it probably would have saved a considerable amount of money. It was recommended that the town officials should break into the sewage treatment plant, since it was their property, and find out what they had. They should then secure the services of a competent engineer, and if possible put the plant into operation.

Walnut

After the receipt of several complaints, an investigation of general sanitary conditions of Walnut was made by a representative of this department, on September 27, 1922.

The water was supplied by a deep well located in the lower section to the southwest of the business district with the natural drainage from this district toward the well. The water was pumped from the wells into a reservoir and then into a stand pipe, which had no covering but was open to birds, small insects and many sources of danger. According to information received, there were only about fifty city water users in the town, which indicates that the larger percentage of the population used water from private sources, which was of unknown quality and in most cases dangerously located near some source of pollution.

The city was not equipped with a sanitary sewer system, and thus it was necessary for each individual to dispose of his wastes privately. Among these means for disposal were outdoor toilets and private cesspools, many of which could be considered as nuisances and were undoubtedly sources of pollution to nearby water supplies.

The town already had plans for a complete sewer system, and sewage treatment plant, and it was recommended and urged that it go ahead with the construction of its sanitary sewer system and then do away with all outside toilets and private seeping cesspools.

Winfield

The water for the public system of Winfield, a town with a population of 1,027, is supplied by two wells. At the time of investigation, April 3, 1924, one well 1,260 feet in depth was supplying the city with water. Another well, about 300 feet in depth, was held in reserve. The water from these wells was pumped by deep well pumps directly into the distribution system, which includes an 80,000 gallon elevated storage reservoir.

The sewage treatment plant consisted of septic tanks, dosing chamber, and sand filters. The sand filters were supporting some vegetable growth and had not been receiving the attention they should have. The plant was gone over with the operator and instructions were given as to the proper operation.

Dyersville

At the request of the county health department of Dubuque county the division of sanitary engineering assisted in putting on a public health exhibit at the county fair held in Dyersville on the 5th and 6th of September, 1922.

The exhibits consisted of a number of charts and a number of models setting forth proper sanitary methods and the greater part of the work consisted of talking with the various people who were interested in the exhibit, giving them information as to the principles

of sanitation as applied to the rural districts and smaller communities.

The fair proved a complete success and it is the opinion of this division that this is an excellent method of doing educational work and public health work in the state.

WATER SUPPLIES USED FOR DRINKING AND CULINARY PURPOSES BY COMMON CARRIERS ENGAGED IN INTERSTATE TRAFFIC

It is required, by Section 19 of the Interstate Quarantine Regulations, issued by the Treasury Department on May 3, 1921, in accordance with the act of Congress approved February 15, 1893, that water provided for drinking and culinary purposes on any car or other means of conveyance while engaged in interstate traffic, shall be from a source which is certified and approved as producing water of satisfactory quality, this certificate to be based on the relative freedom of the water from contamination or freedom from exposure to contamination as determined by a bacteriological and chemical analysis of samples of water and by the survey of the conditions under which the supply is produced.

Either the officers of the U. S. Public Health Service or the State Department of Health may issue these certificates and in the case of Iowa, the surveys are made, simple reports are compiled, and the certificates are issued by this department. The reports and certificates are sent to the Surgeon General of the U. S. Public Health Service for approval and thence the certificates are sent to the common carriers using the supplies.

In case some defect is found in the supply during the survey, the matter of correcting this defect is taken up with the owner of the supply and the report delayed until the defect is corrected so that a favorable report may be made, if co-operation with the owner makes it possible to correct the supply within a reasonable time.

Since the laboratories serving this department are located in Iowa City, and it is often difficult to arrange for the shipment of water containers to certain points over the state at our convenience, we do not attempt to collect samples of water from supplies owned by municipalities, but depend on the Local Board of Health to attend to the collection and shipment of these samples. This often necessitates the delay of the report and certification. In the case of supplies, which are either owned privately or by the railroad companies, we attend to the collection of the specimen at the same time that the survey is made. This often causes a loss of time from waiting for the arrival of the container.

The watering points for common carriers are continually changing, the use of some supplies being abandoned and others added. At the present time, according to the reports from the U. S. Public Health Service and the Railroad Companies, there are 86 different sources of supply being used by these carriers for drinking and culinary purposes within the State of Iowa. With our limited personnel and along with our other work, we attempt to make a survey of each of these supplies at least once a year. During the last biennial period, 150 of such surveys were made, which will not quite average two surveys of each supply or one each year.

INVESTIGATION OF WATER SUPPLIES USED FOR DRINKING AND CULINARY PURPOSES BY COMMON CARRIERS ENGAGED IN INTERSTATE TRAFFIC

Watering Point	Ownership of Supply	Carriers Using Supply	Date of Survey	Latest Recommendation for Certification
Albia	Railroad	C., B. & Q.	Jan. 18-23	
			May 29-24	Favorable
Albia	Private	M. & St. L.	Jan. 18-23	Unfavorable
Albia	Railroad	M. & St. L.	Mar. 27-24	Provisional
Alden	Private	C. & N. W.	Mar. 28-23	
			May 21-24	Favorable
*Alton	City	C., St. P., M. & O. (reported)	Feb. 28-23	Not used
Ames	City	C. & N. W.	Ft. D., D. M. & S. Jan. 2-23	Favorable
Atlantic	City	C., R. I. & P.	Dec. 18-22	
			Feb. 19-24	Favorable
Avoca	City	C., R. I. & P.	Dec. 19-22	Favorable
Belle Plaine	City	C. & N. W.	June 27-23	Favorable
			April 3-24	
Boone	City	C. & N. W.	Jan. 4-24	Favorable
		Ft. D., D. M. & S.		
Burlington	Private	C., R. I. & P.	Feb. 9-23	Favorable
		C., B. & Q.	Feb. 21-24	Favorable
		M., B. & S.		
Calmar	City	C., M. & St. P.	May 8-24	Favorable
Calmar	Railroad	C., M. & St. P.	June 6-23	Favorable
			May 8-24	Favorable
Carroll	City	C. & N. W.	Jan. 30-23	Favorable
			Mar. 28-24	
Cedar Rapids	City	W. C., F. & N.	June 7-23	Favorable
		C., R. I. & P.	Mar. 14-24	Favorable
		I. C.		
		C. & N. W.		
		C., M. & St. P.		
		C. R. & I. C.		
Centerville	City	C., B. & Q.	Jan. 17-23	Favorable
			Mar. 26-24	
Chariton	City	C., B. & Q.	May 16-23	Favorable
			Jan. 29-24	
Cherokee	City	I. C.	Feb. 9-23	Favorable
			Mar. 26-24	
Clarinda	City	C., B. & Q.	Sept. 14-23	Favorable
Clarion	City	C. G. W.	Mar. 29-23	Favorable
Clinton	City	C., R. I. & P.		Favorable
		C. & N. W.		
		C. D. & M.		
Columbus Jct.	City	C., R. I. & P.	Dec. 26-23	Favorable
Council Bluffs	City	C., R. I. & P.	Jan. 5-23	Favorable
		Wabash	Feb. 20-24	
		I. C.		
		C., B. & Q.		
		C. & N. W.		
		C., M. & St. P.		
		C. G. W.		
		U. P.		
Creston	City	C., B. & Q.	Sept. 11-23	Favorable
			June 4-24	
Davenport	City	C., D. & M.	Feb. 18-24	Favorable
		C., M. & St. P.		
Des Moines	City	C., R. I. & P.	May 30-23	Favorable
		Wabash		
		C., B. & Q.		
		C. & N. W.		
		Ft. D., D. M. & S.		
		M. & St. L.		
		D. M. & C. I.		
		C., M. & St. P.		
		C. G. W.		
Dubuque	City	I. C.	Sept. 26-23	Favorable
		C., M. & St. P.		
		C., B. & Q.		
		Dredging Co.		
Eagle Grove	Railroad	C. & N. W.	Mar. 29-23	Favorable

Watering Point	Ownership of Supply	Carriers Using Supply	Date of Survey	Latest Recommendation for Certification
Eldon	City	C., R. I. & P.	June 19-23	Favorable
			Feb. 19-24	
Estherville	City	C., R. I. & P.	July 18-22	Favorable
			Aug. 8-23	
Estherville	Railroad	M. & St. L.		
Ft. Dodge	City	I. C.	Nov. 5-23	Favorable
		M. & St. L.		
		C. G. W.		
		Ft. D., D. M. & S.		
Ft. Madison	City	Carnival City Packet Co.	May 28-24	Favorable
Gowrie	City	C., R. I. & P.	May 20-24	Favorable
Grinnell	City	M. & St. L.	Dec. 23-22	Favorable
			May 26-24	
Guthrie Center	City	C., R. I. & P.	June 13-23	Favorable
			Feb. 18-24	
Hampton	City	M. & St. L.	Mar. 29-23	Favorable
Harlan	City	C. & N. W.	Jan. 30-23	Favorable
Hawarden	City	C. & N. W.	July 12-22	Favorable
			Feb. 27-23	
			April 17-24	
Humeston	Railroad	C., B. & Q.	May 17-23	Favorable
Iowa City	Private	C., R. I. & P.	July 3-22	Favorable
			Dec. 8-23	
Iowa Falls	City	C., R. I. & P.	Mar. 29-23	Favorable
			May 21-24	
Keokuk	Private	T. P. & W.	May 3-23	Favorable
		Wabash	Feb. 20-24	
		C., B. & Q.		
Lake City	City	C. & N. W.	Mar. 27-24	Favorable
Lake Park	Railroad	C., R. I. & P.	July 17-22	Favorable
			Aug. 9-23	
			April 15-24	
Lakota	Railroad	C., R. I. & P.		
McGregor	City	Freeman Ferry Co.		
Manilla	Railroad	C., M. & St. P.	April 16-23	Favorable
Manilla	City	C., M. & St. P.	April 16-23	Favorable
Manly	Railroad	C., R. I. & P.	June 7-23	Favorable
			June 13-24	
Marion	City	C., M. & St. P.	Feb. 22-23	Favorable
			Mar. 14-24	
Marquette	City	C., M. & St. P.	May 8-24	Favorable
Mason City	City	C. & N. W.	Mar. 31-23	Favorable
		C., M. & St. P.		
		C. G. W.		
Mason City	Railroad	C., M. & St. P.	Mar. 31-23	Favorable
			June 13-24	
Mason City	Railroad	M. & St. L.	Mar. 31-23	Favorable
			June 13-24	
Missouri Valley	City	C. & N. W.	Jan. 3-23	Favorable
Moulton	Railroad	Wabash	Jan. 17-23	Favorable
			Mar. 26-24	
Mt. Pleasant	City	C., B. & Q.	Dec. 28-23	Favorable
Muscatine	City	C., R. I. & P.	Feb. 7-23	Favorable
		C. D. & M.	Feb. 18-24	
		M. B. & S.		
Newton	City	C., R. I. & P.	April 10-23	Favorable
			May 26-24	
Oelwein	City	C. G. W.	Mar. 13-24	Favorable
Onawa	City	Ferry Boat	Sept. 9-22	Favorable
Oelwein	Railroad	C. G. W.	June 6-23	Favorable
Osage	Railroad	C. G. W.	June 7-23	Favorable
			Mar. 12-24	
Oskaloosa	City	C., R. I. & P.	Jan. 15-23	Favorable
		C., B. & Q.	Mar. 6-24	
		M. & St. L.		
Ottumwa	City	C., B. & Q.	Jan. 16-23	Favorable
			Feb. 22-24	
Pacific Jct.	Private	C., B. & Q. (reported)	Jan. 4-23	Not used
Perry	City	M. & St. L.	Jan. 5-23	Favorable
		C., M. & St. P.	May 19-24	
Perry	Railroad	C., M. & St. P.	Jan. 5-23	Provisional
			May 19-24	

Watering Point	Ownership of Supply	Carriers Using Supply	Date of Survey	Latest Recommendation for Certification
Preston	City	C., M. & St. P. (reported)	June 26-24	Not used
Red Oak	City	C., B. & Q.	Sept. 12-23	Favorable
			Jan. 23-24	
Rock Rapids	City	C., St. P., M. & O.	July 13-22	Favorable
			Mar. 1-23	
			April 15-24	
Rockwell City	City	Ft. D., D. M. & S.	Feb. 7-23	Favorable
			Mar. 24-24	
Sanborn	City	C., M. & St. P.	July 14-22	Favorable
			Feb. 28-23	
Shenandoah	City	C., B. & Q.	Sept. 13-23	Favorable
			Jan. 21-24	
Shopton	Railroad	A., T. & S. F.	May 29-23	Favorable
			Feb. 20-24	
Sibley	Railroad	C., R. I. & P.	July 13-22	Favorable
			Aug. 9-23	
			April 14-24	
Sidney	City	C., B. & Q.	Sept. 13-23	Favorable
Sioux City	City	C., St. P., M. & O.	Sept. 6-23	Favorable
		I. C.	April 14-24	
		C., B. & Q.		
		C. & N. W.		
		C., M. & St. P.		
Sioux City	Railroad	C., M. & St. P.	Sept. 6-23	Favorable
			April 14-24	
Sioux City	Railroad	G. N.	Sept. 6-23	Favorable
			April 14-24	
Spencer	City	C., M. & St. P.	Dec. 11-23	Favorable
Spirit Lake	City	C., M. & St. P.	July 17-22	Favorable
			Aug. 8-23	
Storm Lake	City	M. & St. L.	Feb. 7-23	Favorable
			Mar. 25-24	
Stuart	City	C., R. I. & P.	Oct. 27-22	Favorable
			Feb. 18-24	
Sumner	City	C. G. W.	June 6-23	Favorable
			Mar. 13-24	
Tama	Railroad	C. & N. W.	Sept. 11-23	Favorable
			May 5-24	Favorable
Tipton	City	C. & N. W.	Feb. 21-23	Favorable
			Mar. 13-24	
Titonka	Railroad	C., R. I. & P.	Aug. 9-23	Use discontinued
Van Wert	Railroad	C., B. & Q.	May 17-23	Favorable
			Mar. 25-24	Favorable
Valley Jct.	City	C., R. I. & P.	April 4-23	Favorable
			April 29-24	
Villisca	City	C., B. & Q.	Sept. 12-23	Favorable
			Jan. 23-24	
Wall Lake	City	C. & N. W.		
Washington	City	C., R. I. & P.	Dec. 27-22	Favorable
			May 27-24	
Waterloo	City	W. C., F. & N.	Feb. 12-23	Favorable
		I. C.	Mar. 13-24	
Waterloo	Railroad	W. C., F. & N.	April 18-24	Favorable

LABORATORIES

DON M. GRISWOLD, M. D., D. P. H., DIRECTOR

The laboratories are organized to carry on all of the laboratory work having a bearing on the subject of public health within this state.

For purposes of administration the laboratory work is divided into the following divisions:

I Bacteriological Division.
II Water Division.
III Epidemiological Division.
IV Serological Division.
V Records and Reports Division.

Detailed reports of each division follow. During the biennial period of 1922-24 there were 552,843 outfits made up and specimens examined in these laboratories. This represents an increase of 86% over the previous biennium.

The examination of and reporting on yearly such a number of specimens is a state service of no small moment.

When this work is done in private laboratories the price is one dollar per specimen for the work of the Bacteriological Division and five dollars per specimen for water examinations and Wassermann tests.

At the lowest figure, the laboratories furnished nearly one-half million dollars worth of service to the state during the biennium.

BACTERIOLOGICAL DIVISION

R. L. Laybourn, Chief

STAFF

The staff of the Bacteriological Division consists of a chief bacteriologist, an assistant bacteriologist, two technicians and an attendant.

DUTIES

The division is authorized to make all examinations (other than water analysis and venereal disease examinations) which are directly related to the detection and control of communicable diseases. Routine examinations for diphtheria, typhoid fever, tuberculosis and rabies constitute the major portion of the work. While the less common examinations do not compare favorably in number with the above mentioned examinations, yet the actual time required in making these examinations is considerable as many single examinations demand as much time as is required for the examination of five hundred diphtheria cultures.

In addition to the duties mentioned above, the employees of the division make up and ship all laboratory specimen outfits required in their work. The division also takes charge of the proper placing of all specimens submitted, which the Laboratories for the State Board of Health are not authorized to do.

AMOUNT OF WORK DONE

During the biennial period ending June 30, 1924, the Bacteriological Division has made 80,950 examinations, an increase of 20,157 over the examinations of the previous biennium. The division also made up and distributed 161,236 laboratory specimen outfits, an increase of 54,004 over

the previous biennium. The increase in the total number of items handled during this biennium was 74,161.

WORKING CONDITIONS

There has been little improvement in the working conditions described in the previous biennial report. The plans for the new University Medical School provide for quarters for the Laboratories for the State Board of Health which will probably be adequate for present needs. The chief of this division has spent considerable time in working out the details of these plans.

DETAILED REPORT OF WORK DONE

Diphtheria Examinations

A total of 69,101 diphtheria examinations were done during the biennium, an increase of 20,061 over the number handled during the previous biennium.

Table No. 1 gives detailed information regarding the diphtheria examinations.

Typhoid Examinations

During the biennium 3,298 typhoid examinations were made. Of these, 3,161 were Widal tests, 90 feces and urine examinations and 47 blood cultures.

As mentioned in the last biennial report, the blood culture examination for typhoid fever possesses distinct advantages over the Widal test in that it is most valuable in the early stages of the disease, before a Widal reaction can be obtained. Also the isolation of the typhoid bacillus is definite proof of a typhoid infection, whereas the Widal test occasionally gives a positive reaction in conditions other than typhoid fever.

But few of the physicians of the state have availed themselves of the blood culture test during the biennium but it is hoped that with continued publicity, the number of practitioners using this test will increase rapidly.

Table No. 2 gives detailed information regarding the typhoid examinations done during this biennium.

Tuberculosis Examinations

The examination of sputum for the tubercle bacillus constitutes the major portion of the tuberculosis examinations. During the biennium 8,054 tuberculosis examinations were made.

Table No. 3 gives detailed information regarding these examinations.

Rabies Examinations

A total of 254 rabies specimens were handled during the biennium, an increase of 143 over the previous biennium. From observation of the laboratory reports from various city and state laboratories, it appears that the number of cases of rabies is increasing rapidly in many parts of the United States. Unless effective measures are instituted for the control of the disease, it will undoubtedly become a very serious public health problem. The one injection prophylactic treatment for animals

seems to offer a practical method of control and these laboratories have advised its use where ever possible.

Considerable effort has been made to disseminate information regarding the proper handling of suspected cases of rabies and proper packing of specimens submitted. The pamphlet on rabies, issued by the State Board of Health, has been sent to the Mayor, Chief of Police, Superintendent of Schools and other public officials as well as copy for the local newspaper in communities from which specimens have been received, with a consequent improvent in the condition of succeeding specimens and a more rational handling of suspected cases of the disease.

Table No. 4 gives detailed information regarding rabies examinations.

Epidemic Cerebro-Spinal Meningitis Examinations

Examination of specimens for epidemic cerebro-spinal meningitis at a distance from the patient continue to be very unsatisfactory because of the susceptibility of this organism to changes in temperature when recently removed from the body. The use of thermos bottles for the shipment of such specimens has not proved entirely satisfactory. The majority of physicians ignore our request that a specimen of the spinal fluid be collected on a glass slide and dried at the time the specimen is collected. When done this gives us a specimen representative of the condition of the fluid at the time of collection.

Table No. 5 gives detailed information regarding epidemic cerebro-spinal meningitis examinations.

Miscellaneous Examinations

A total of 216 miscellaneous examinations were made during the biennium, an increase of 54 over the previous biennium.

Table No. 6 gives a summary of the miscellaneous examinations done.

TABLE 1—SPECIMENS RECEIVED FOR THE EXAMINATION OF DIPHTHERIA

	Positive	Negative	Diagnosis Reserved	Specimens Unsuitable for Exam.	Total
Diagnosis—					
1922-1923	2,374	6,918	824	11	10,127
1923-1924	2,216	13,356	1,166	39	16,777
Total	4,590	20,274	1,990	50	26,904
Release—					
1922-1923	4,160	8,060	365	21	12,606
1923-1924	2,760	7,802	623	1	11,186
Total	6,920	15,862	988	22	23,792
Carrier—					
1922-1923	761	15,759	341	14	16,875
1923-1924	192	1,199	109	0	1,500
Total	953	16,958	450	14	18,375
Virulence Tests—					
1922-1923	9	7	0	0	16
1923-1924	12	2	0	0	14
Total	21	9	0	0	30
Total	12,484	53,103	3,428	86	69,101

Grand total for the biennial period, 69,101.

TABLE 2—SPECIMENS RECEIVED FOR THE EXAMINATION OF TYPHOID FEVER

	Positive	Negative	Weak Reaction	Specimens Unsuitable for Exam.	Total
Widal—					
1922-1923	249	1,109	186	3	1,547
1923-1924	284	1,102	227	1	1,614
Feces and Urine—					
1922-1923	5	17	0	1	23
1923-1924	17	49	1	0	67
Blood Cultures—					
1922-1923	3	15	0	0	18
1923-1924	15	14	0	0	29
Total	573	2,306	416	5	3,298

Grand total for the biennial period, 3,298.

TABLE 3—SPECIMENS RECEIVED FOR THE EXAMINATION OF TUBERCULOSIS

	Positive	Negative	Diagnosis Reserved	Specimens Unsuitable for Exam.	Total
Sputum—					
1922-1923	495	3,349	0	79	3,923
1923-1924	383	3,642	0	21	4,046
Total	878	6,991	0	100	7,969
Feces and Urine—					
1922-1923	6	21	3	0	30
1923-1924	1	31	0	0	32
Total	7	52	3	0	62
Milk—					
1922-1923	0	0	0	0	0
1923-1924	0	2	0	0	2
Total	0	2	0	0	2
Pus—					
1922-1923	0	1	0	0	1
1923-1924	1	9	0	0	10
Total	1	10	0	0	11
Spinal Fluid—					
1922-1923	1	1	0	0	2
1923-1924	0	8	0	0	8
Total	1	9	0	0	10
Totals	887	7,064	3	100	8,054

Grand total for the biennial period, 8,054.

TABLE 4—SPECIMENS RECEIVED FOR THE EXAMINATION OF RABIES

	Positive	Negative	Diagnosis Reserved	Specimens Unsuitable for Exam.	Total
Dog Head—					
1922-1923	41	22	15	12	90
1923-1924	56	34	20	9	119
Total	96	56	35	21	209
Heads of Cat, Hog, Calf, Squirrel, Horse, Fox—					
1922-1923	7	1	3	0	11
1923-1924	13	9	7	5	34
Total	20	10	6	0	46

Grand total for the biennial, 254.

TABLE 5—SPECIMENS RECEIVED FOR MENINGITIS

	Positive	Negative	Diagnosis Reserved	Specimens Unsuitable for Exam.	Total
Spinal Fluid—					
1922-1923	0	13	0	5	18
1923-1924	0	9	0	0	9
Total	0	22	0	5	27

Grand total for the biennial period, 27.

TABLE 6—SPECIMENS RECEIVED FOR EXAMINATION OF MISCELLANEOUS MATERIAL

	Positive	Negative	Diagnosis Reserved	Rejected	Total
Smears, Etc.—					
1922-1923	41	80	0	6	127
1923-1924	22	61	6	0	89
Total	63	141	6	6	216

Grand total for biennial period, 216.

TABLE 7—OUTFITS DISTRIBUTED

	Diphtheria	Tuberculosis	Typhoid	Wassermann	Gonococcus	Blood	Feces	Meningitis	Miscellaneous	Water	Total
1922-3	77,262	7,241	3,736	29,924	3,396	33	27	22	6	1,075	122,722
1923-4	60,988	8,297	3,293	34,862	3,466	120	203		8	1,057	112,294
Total	138,250	15,538	7,029	64,786	6,862	153	230	22	14	2,132	235,016

SEROLOGICAL DIVISION

Miss Zelma Zentmire, Chief

The Serological Division, in common with the other divisions of the Laboratories for the State Board of Health, has experienced an enormous increase in the volume of work received during the biennium. A total of 72,961 specimens were received, an increase of 25,283 specimens or 53% over the previous biennium. This increase has been due both to the greater number of physicians availing themselves of the service of the laboratory and to the larger number of specimens submitted by individual physicians.

In order to handle the increase in work, it was necessary to add an additional technician to the staff. This additional assistance also made it possible for the laboratory to run the Wassermann test three times a week instead of twice a week as was previously done.

Future plans for the division include larger quarters and a larger staff to take care of the rapidly increasing routine. It is felt that it is highly desirable to run the Wassermann test daily but this change can not be made until more assistance is available. Additional assistance will also leave time for investigation work in connection with the latest developments in laboratory procedure. While a state laboratory must be rather conservative as regards the technique employed, yet it must be progressive enough to use the most up to date approved methods and strive to improve these methods if possible.

Detailed information regarding the examinations made by this division will be found in Table No. 8.

The accompanying graph shows the growth of the Wassermann work since the establishment of the Serological Division.

TABLE 8—SPECIMENS RECEIVED BY SEROLOGICAL DIVISION

	1922-23	1923-24
Blood—		
Cholest. Ant. Positive Alch. Ant. Positive	4,270	5,448
Chol. Ant. Negative Alch. Ant. Negative	22,084	29,411
Chol. Ant. Positive Alch. Ant. Negative	292	475
Chol. Ant. Positive Ach. Ant. Doubtful	494	706
Chol. Ant. Doubtful Alch. Ant. Negative	353	397
Specimens unsuitable for examination	827	795
Anticomplementary	44	54
Chol. Ant. Doubtful Alch. Ant. Doubtful	265	336
Spinal Fluid—		
Alch. Ant. Positive	264	261
Alch. Ant. Negative	668	672
Alch. Ant. Doubtful	21	30
Anticomplementary	19	17
Specimens unsuitable for examination	9	14
Gonorrhea—		
Positive	457	474
Negative	1,050	682
Doubtful	963	1,054
Specimens unsuitable for examination	21	15
Bacillus of Ducrey	2	3
Spirochaete	11	8
Total	32,114	40,847

Grand total: 1922-24, 72,961.

WATER LABORATORY DIVISION

Jack J. Hinman, Jr., Chief

The Water Laboratory Division of the Laboratories for the State Board of Health is located on the second floor of the Medical Laboratories Building of the University of Iowa at Iowa City. Like the other divisions of the Laboratories for the State Board of Health it is under the direction of Doctor Don M. Griswold. The work of the division is under the direct charge of Mr. Jack J. Hinman, Jr., who is also Associate Professor of Sanitation of the University. Mr. Hinman has been assisted by Mr. Martin E. Flentje of Sheldon, from July 1, 1922 to September, 1922; by Mr. H. D. Carter of Iowa City, from September, 1922 to October, 1923, and by Mr. Kenneth C. Armstrong of West Branch, from October, 1923 to the end of the biennium. Miss Irene Hogan and Mr. Hubert J. Evers have been employed as laboratory technicians.

The water laboratory was opened in February, 1914, in accordance with an act of the 35th General Assembly appropriating $5,000 per annum to the University of Iowa for an "epidemiologist and laboratory." The 36th General Assembly reorganized the work and required that a fee not to exceed $2.00 for each sample examined be charged. This fee has been set at $1.00 per sample except in certain special cases where a large number of samples are examined from one community. In such cases a reduction of the fee has been authorized by regulation. The fee has been very obstructive to the maximum usefulness of the water laboratory, as it has prevented a more general use of the facilities available. Any well in the state may conceivably be the focus of a typhoid epidemic, and the economic loss to the state from one death due to typhoid fever is usually placed at a value well in excess of the profits from the examinations of the water laboratory for one year.

The yearly totals of analyses of water have been as follows.

February 16, 1914 to June 30, 1915.....1,366
July 1, 1915 to June 30, 1916.....1,122

July 1, 1916 to June 30, 1917	2,012
July 1, 1917 to June 30, 1918	1,955
July 1, 1918 to June 30, 1919	1,888
July 1, 1919 to June 30, 1920	2,103
July 1, 1920 to June 30, 1921	2,672
July 1, 1921 to June 30, 1922	3,692
July 1, 1922 to June 30, 1923	3,413
July 1, 1923 to June 30, 1924	3,052

The current biennium shows a slight increase in number of samples examined over the number examined in any preceding biennium, although the last two years have not shown such a large number of examinations as the year preceding. Many communities in the state are not keeping in sufficiently close knowledge of the condition of their water supplies. Constant reminding is necessary to secure a proper supervision by the examinations of water specimens. Each change of municipal public officials brings into office men who are not acquainted with the local water situation and who must be informed about the dangers and needs of their particular water supply. A continuous program of publicity and education is therefore necessary in order that public and private water supplies may be prevented from being dangerous to the public whose health and convenience they are designed to serve.

Just before the close of the biennium occurred an incident which shows very clearly the need for regular periodic analysis of water supplies from deep wells. The city of Buffalo Center was attacked by typhoid fever and about 70 cases were reported. An investigation by a representative of the department showed that the water supply was to blame. It was found that although the water came from a well in the neighborhood of 300 feet deep, the water was badly polluted. An inspection of the well pit showed that any water which covered the floor of the well pit to a depth of about two inches could enter the well. During most of the time when waste water from the pump drained freely away the water was probably not seriously polluted, though it is likely that it would show evidence of its suspicious character upon analysis. In one corner of the pit was a drain leading to the sewer in the street nearby. Any backing up of sewage from the drain would allow such dangerous wastes to have direct access to the deep well. An experiment with dyes showed that any material gaining entrance to the well would show up in the water pumped by the deep well pump in ten minutes, or less. At the time of the outbreak of the epidemic there were no analyses of the city supply of Buffalo Center on record. If analyses had been regularly made, it is possible that the condition might have been detected and the epidemic thus avoided. At least two deaths are traceable to this epidemic.

The city of Manchester has been supposed to get its supply from a deep well, 1800 feet in depth. Analyses of the city water have been several times reported to the community as suspicious. At last an analysis showing the water unsafe was reported, and a survey of the local situation was made by the State Sanitary Engineer. The reports of the laboratory had indicated the possibility of intermittent contamination of the well, and it was therefore not considered surprising that the unsafe condition of the water was detected. The survey of the Sanitary Engineer

disclosed the fact that the well, originally drilled to 1,800 feet, had not been cased except near the top. Here a temporary wooden casing had been placed. Evidence pointed to the fact that the sides of the well had slumped and that the water seemed to be derived from very close to the surface. Points of entrance of surface water could be detected with ease. It is fortunate that there has been no epidemic of typhoid fever thus far reported from Manchester.

Failures of metallic casings are by no means uncommon. Much of the water taken from deep wells in Iowa attacks the metal of casings, and after a time the casings rust through letting in polluted surface waters, thus endangering health. No one can tell just how long a well casing will last, but periodic analyses may help to detect the condition before any very serious harm can have been done. The incident of the failure of the well casing of one of the 1400 foot wells of the city of Waterloo illustrates the situation. Twice in about seven years it has been found that one of the city wells has become unsatisfactory due to the attack of the water on the casing, particularly in the upper 200 feet. The first time the condition developed the work of repair was easily carried out, but the second time the work could not well be done, and chlorination of the water was recommended by the Water Laboratory Division. Chlorination is still being carried out and its adequacy is being checked by laboratory work done by the city of Waterloo, supplemented by work done by the Water Laboratory Division.

In addition to difficulties of the sort mentioned, there are other troubles that beset the deep well. Sometimes the casing is not carried deep enough to keep out undesirable waters. Sometimes it is not properly set. Sometimes, as in the case of one of the wells of the city of Grinnell, the casing pulls apart, and the lower part falls away for several feet, leaving an opening into which water from the shallower strata may find a way. Dependence must not be put upon the fact that the well is a deep one. Periodic analyses are necessary to show that it is receiving all its water from the deep-lying source and that no dangerously polluted waters are being mixed in and delivered to an unsuspecting public. In most cases the dangerous character of the water will not be apparent to the taste, and the water will not be noticeably colored or turbid. If the analysis is unsatisfactory, the community has a chance in many cases to rectify conditions before real danger is at hand, or an epidemic is in their midst taking its toll.

The shallow wells share the dangers of the deep well, and have additional dangers of their own as a consequence of their being dependent upon shallower sources for their water. They are more dependent upon local weather conditions for their supply. Unusually wet, or unusually dry weather may bring a change from the normal quality. Most of the trouble of the shallow well comes from the conditions of the top and the upper part of the casing which are often constructed in such a way that the surface water is not excluded. The upper ten or twelve feet of the curbing and the top of the well at least, ought to be water-tight. Surface drainage is likely at any time to carry with it material of a sewage-like nature, and sewage, especially town sewage, is very likely to contain

the bacteria which are the cause of typhoid fever and other intestinal disorders.

The public shallow wells which supply towns in Iowa are frequently objectionable, but the proportion of unsafe private shallow wells upon the farms and town properties is much greater than that of the unsafe public wells. The reason lies in the fact that, unsatisfactory as is the supervision over the public supplies, supervision over private supplies and appreciation by their owners of the condition of the wells is almost lacking.

Where water is known to be unsafe as it is obtained, as is the case with water taken from streams, lakes, ponds, and some infiltration gallaries and wells, it is necessary that close supervision shall be maintained over the quality of the water after treatment and as pumped to the public. The closer the control over such supplies, the better. The type of treatment necessary will need to be determined in each individual case, but all kinds of equipment need to be checked up at frequent intervals to see that they are functioning in an adequate manner. In many of the larger water purification plants the water is checked at intervals as short as one-half hour, and more complete examinations are made several times a day. Daily analyses are very desirable under most conditions but this frequency of examination is unfortunately beyond the means and equipment of most of the water purification plants in Iowa. A few of the water works such as those at Council Bluffs, Davenport and Des Moines, have laboratories where daily tests are regularly made upon the untreated water and upon the purified effluent of the plant. Some others, such as Keokuk and Waterloo, make examinations several times a week. In other places, such as Mason City, Oskaloosa, Dubuque and Sioux City, the water is tested at intervals by the city bacteriologist or city chemist employed by the local health department.

Other plants have the opportunity to take advantage of the service of the Water Laboratory Division which will examine the water from the plant, and if it is not as satisfactory as desired, will suggest means of bringing the water to a sufficiently pure state to insure its safety. The community which has most consistently taken advantage of this service is Burlington. Two or three samples from Burlington are received each week for checking the performance of the plant. The number of samples of Burlington's supply examined in the Water Laboratory is rapidly nearing the 1,000 point.

It is unfortunate that more communities have not followed Burlington's example. The Water Laboratory has a capacity of equipment which would allow it to care for a goodly number of such plants. Indifference to the quality of water supplied to the people is too often found, and may be expected to have serious results sooner or later.

Realizing the situation with the water supplies under its jurisdiction the State Board of Health during the preceding biennium altered its regulations for the examination of public water supplies. Before that time each municipality, irrespective of the type of water supply maintained, was expected to submit samples of its city water to an examination at least semi-annually. The present regulations require that each city or town shall have the examination of its supply conducted according to

a minimum schedule based upon the character of its water. This schedule is as follows:

1. Water supplied by wells over 100 feet in depth, and found by the Water Laboratory Division of the Laboratories for the State Board of Health to be satisfactory at the last examination, at least one analysis in each six months period.

2. Water supplied by wells less than 100 feet in depth, and found by the Water Laboratory Division of the Laboratories for the State Board of Health to be satisfactory at the last examination, at least one analysis in each three months period.

3. Water supplied from surface sources, whether purified or not, and all other supplies found unsatisfactory by the Water Laboratory Division of the Laboratories for the State Board of Health or other authorized laboratory, shall be examined as frequently as may be necessary in the opinion of the Chief of the Water Laboratory Division of the Laboratories for the State Board of Health, and in any case there shall be at least one analysis per month.

The analyses referred to above are required to be made in the Water Laboratory Division of the Laboratories for the State Board of Health, or in an authorized branch laboratory which shall promptly report results thereof to the Water Laboratory Division. All analyses are required to be performed under the rules and regulations issued by the Director of Laboratories for the State Board of Health.

At the present time there are authorized branch laboratories at Ames, Burlington, Carroll, Creston, Des Moines, Dubuque, Ft. Dodge, Grinnell, Mason City, Sioux City, Washington and Waterloo. The laboratories of the water plants at Cedar Rapids, Council Bluffs, Davenport, Des Moines and Waterloo, are authorized branch laboratories as far as examinations of the public water supplies of those communities are concerned.

The State Board of Health also passed during the biennium of 1920-22 a resolution calling upon all water purification plant operators to forward reports upon the operation of their respective plants to the Water Laboratory Division at weekly intervals. Special forms are supplied and the operators are informed that the purpose of the requirement is to help them to serve their communities in a better manner and to enable the Water Laboratory Division to serve them. When these reports are received at the Water Laboratory, they are gone over by the Chief of the Division and a card is sent acknowledging the receipt of the report and making such suggestions as seem to be advisable. Particular effort is made to keep in close personal touch with water purification plant operators. It is believed that the system of reporting has been very much worth while, both in enabling the Water Laboratory Division to assist in getting better operation of the treatment plants of water supplies, and in helping the operators of the smaller type plants to keep records and secure better, more consistent, and more economical results.

No type of water purification so far developed yields satisfactory results at all times, even when operated by trained personnel. The following table summarized the situation with regard to Iowa filtration and coagulation plants:

City	No. Samples Since Feb., 1924	No. Unsatisfactory	Last Examination
Adel	11	2	June 10, 1924
Bedford	22	7	June 14, 1924
Burlington	874	41	June 27, 1924
*Cedar Rapids	33	8	Aug. 9, 1923
Centerville	76	12	May 13, 1924
Chariton	42	20	June 4, 1924
Clarinda	30	7	June 11, 1924
Clear Lake	2	2	June 23, 1924
Corning	17	6	June 12, 1924
Corydon	19	8	June 11, 1924
*Council Bluffs	9	1	Jan. 6, 1923
Creston	45	9	Mar. 27, 1924
*Davenport	57	11	May 22, 1924
Fairfield	23	5	Jan. 9, 1924
Fort Madison	43	7	June 11, 1924
Iowa City	3,657	57	June 30, 1924
Jefferson	9	3	Dec. 14, 1923
*Keokuk	146	18	May 22, 1924
Lamoni	2	0	Nov. 13, 1924
Lenox	20	7	May 27, 1924
Oskaloosa	12	2	Mar. 14, 1924
Ottumwa	22	2	June 20, 1924
Storm Lake	43	19	May 29, 1924
What Cheer	9	1	June 19, 1924

*Means authorized branch laboratory.

From the above table which summarizes the results on coagulated and filtered waters with that treatment, followed in most cases by chlorination, it is seen that about 2% of the samples from the treatment plants were not considered satisfactory. In the case of waters which require only chlorine treatment to make them safe the percentage of unsatisfactory samples should be even less. In general, supplies which require only chlorination are clear and practically colorless, and no difficulty is to be expected in the effort to secure a clarified effluent from a muddy river or pond water, as is the case where the water is handled by the plants in the above list.

Water purification plants have been installed for the treatment of public water supplies in the following Iowa cities and towns:

Chlorination plants. (Treating with liquid chlorine only.) Akron, Arnold's Park, Audubon, Avoca, Boone, Brooklyn, Camp Dodge, Cresco, Cherokee, Cherokee State Hospital, Clarinda State Hospital Des Moines, Decorah, Dubuque, Everly, Hedrick, Lisbon, Marshalltown, Newton, Odeboldt, Sac City, Sanborn, Spirit Lake, Waterloo, Woodward State Hospital. (25).

Emergency Chlorine Installations. Cedar Falls, Fort Dodge, Muscatine. (3).

Coagulation Plants. (Those using chlorine marked "(Cl)".) Corning (Cl), Council Bluffs (Cl), Lamoni. (3).

Filter Plants. (Those using chlorine are marked "(Cl)".) Adel (Cl), Ames I. S. C. (Cl), Bedford (Cl), Burlington (Cl), Cedar Rapids (Cl), Centerville (Cl), Chariton (Cl), Clarinda (Cl), Clear Lake, Clinton (emergency filter out of use since 1907), Corydon (Cl), Creston (Cl), Davenport (Cl), Fairfield (Cl), Fort Madison (Cl), Iowa City (Cl), Jefferson (Cl), Keokuk (Cl), Osceola (Abandoned), Oskaloosa (Cl), Ottumwa (Cl), Storm Lake (Cl), What Cheer (Cl). (23).

Even though treated waters are unsatisfactory at times as has been pointed out above, the percentage of unsatisfactory samples among them is small compared to the percentage of unsatisfactory samples among well supplies including even the deeper ones. This fact is probably due to the fact that those persons who are entrusted with the supervision of a treated supply realize more distinctly that the water supply may be potentially unsafe if not properly safeguarded. Frequently analyses are therefore more generally the rule where the water is purified and the teatment given is altered according to conditions found upon examination.

The examinations made by the water laboratory are of the sort known as "sanitary chemical and bacteriological examinations." Their purpose is to discover whether or not the water is likely to cause any intestinal disease such as typhoid fever. Waters which cause such disorders are contaminated by the sewage-like matters with which pathogenic bacteria are found and the analyses are therefore aimed at discovering whether or not the waters are free from such substances.

Mineral, boiler, and medicinal analyses are not made by the Water Laboratory Division as these examinations are commercial in their nature, and not "in the interest of the public health and for the purpose of preventing epidemics of disease." Only such analyses as come within the latter classification are permitted to be made by the act of the 36th General Assembly, which reorganized the work of the Water Laboratory Division in 1915.

The act of the 36th General Assembly requires, as has been stated above, that a fee shall be charged for each analysis made by the Water Laboratory Division. This fee has been set at $1.00 per sample for all specimens received in the usual way. The fee goes to the general funds of the state of Iowa and is not available for the purposes of the laboratory. In addition to the statutory fee, the senders of samples are required to pay expressage on the containers supplied for the collection of samples. The containers are sent out by express collect and are returned to the laboratory with the express charges fully prepaid. The cost of transportation is not high.

Samples collected in bottles other than those supplied by the department are not examined except under exceptional circumstances. The reason for this policy is that the bottles in which the samples are sent are in most cases not properly prepared and may give up materials to the water specimen which cause the results to be untrustworthy. If the bottle is not sterilized before the sample is collected it is likely that bacteria from the bottle may contaminate the water and make the water appear to be worse than is really the case. Frequently bottles used for the collection of samples of water have been used for some other substanc than water and they may yield substances to the specimen that cause the chemical examination to be misleading. When it is considered that most of the determinations in water analysis are reported in parts of the substance per million parts of water, the necessity of rigid care to exclude foreign matters becomes understandable. Still further it is necessary

that the water samples shall be transmitted promptly to the laboratory and while on the way shall be kept at a very low temperature. This is to prevent multiplication of bacteria and alteration of some very unstable compounds which are of diagnostic value in the examination.

The containers supplied by the Water Laboratory Division consist of sterile, wide-mouth, glass stoppered bottles enclosed in metallic cylinders and placed in a case which allows packing in ice. The bottles are made chemically clean and are then baked in an oven to render them sterile. A sterile piece of aluminum foil is then placed over the stopper to protect it against contamination, and the foil is further protected by a piece of muslin tied over it and then sealed with a wax official seal. The seal insures the sterility of the bottle. The metallic cylinder is for the purpose of protecting the bottle against the water produced by the melting of the ice in the box. The cylinder is of such size that it cannot fall over if there should not be sufficient packing to hold it in an upright position. Excelsior is used for packing as the box leaves the laboratory, and it is expected that a part of the excelsior will be removed and the place of it taken by about ten pounds of cracked ice to keep the water sample cool on its return journey to the laboratory. Inasmuch as containers are frequently placed in warm cars and stations, the ice should be used in winter as in summer. The box used for the shipment is insulated by a half inch layer of felt or cork to retard the melting of the ice. Fully detailed directions for the collection of the sample accompany each container.

When the sample reaches the Water Laboratory the examination is begun at once, and the report is sent out in a week to ten days depending upon the amount of work necessary and the number of samples being received. In each case the sender of the sample is supplied with the numerical data obtained in the analysis, although it is understood that the technical material is incomprehensible to many physicians and others. In the case of all samples which are satisfactory, a statement of that fact is made under the head of "remarks," testifying to the fact that the sample is "Satisfactory at this time." In all other cases a specially written letter is sent to the sender of the sample explaining why the specimen is bad and suggesting how conditions may possibly be improved.

A carbon copy of the numerical data and statement of findings, but not of explanatory letter is sent to the mayor of the city or town from which the specimen came. If from a rural district the carbon copy is sent to the county or township clerk. The desire is that the local board of health may be informed about the condition of all water supplies under its jurisdiction. A carbon copy of the report is also sent to the State Sanitary Engineer for his files. In the case of supplies used for drinking water for persons traveling on trains in interstate traffic, a third carbon copy is made for transmission to the United States Public Health Service, Division of Domestic Quarantine.

Persons who enquire about the results of analyses of waters belonging to others are referred to the local board of health for information. It is believed that they are in a better position than the Water Laboratory staff to know whether information about the particular case should be given out or withheld.

Since the Water Laboratory is very anxious to supply information which can be implicitly relied upon, and endeavors to give advice worthy of the confidence of the public, the examinations are made by properly qualified persons and by no others. Student work is not utilized in the conduct of laboratory examinations. Moreover no printed standards of values are used or advocated, but the report upon each sample is made by the Chief of the Division after a full consideration, and in the light of experience gained in several years work with Iowa water supplies. In using standards it is necessary to keep in mind so many exceptions to the rule that inexperienced perons are likely to be led into serious error.

Sewage and sewage disposal are intimately connected with the condition of our streams. Examinations of sewage and of sewage treatment plant effluents therefore fall within the scope of the work of the Water Laboratory. However sewage samples are even more perishable than samples of water and the examination is best made on the spot where the sample was collected. The same is true of specimens of stream water collected for the determination of the amount of dissolved oxygen. Examinations of natural and artificial ice, and the examination of water from swimming pools are also conducted by the Water Laboratory.

Technical service, analysis, and advice is therefore at the command of the people of Iowa on all sorts of water supplies, and the sanitation of swimming pools and bathing beaches.

SPECIAL INVESTIGATIONS

The greater part of the work of the Water Laboratory is of necessity confined to the laboratory itself. However in the prosecution of the work it is necessary to do a certain amount of field work. During the biennium, Mr. Hinman, the chief of the division, has made the following trips of investigation:

1922		City	Purpose
July	7	Ames	Inspection of water works.
		Marshalltown	Inspection of water works.
	10	Oelwein	Inspection of water works.
		New Hampton	Inspection of water works.
	11	Charles City	Typhoid cases.
		Marble Rock	Inspection of water plant, en route.
		Waterloo	Inspection of water works, en route.
Sept.	13	Fairfield	Inspection of water works.
	14	Chariton	Investigation of water plant.
	15	Newton	Inspection of city wells.
		Brooklyn	Inspection of water works.
Nov.	17	Council Bluffs	Inspection of water supply of Iowa School for the Deaf. Inspection of city water plant.
1923			
Jan.	4	Ames	Inspection of water plant.
		Jefferson	Inspection of softening plant.
		Boone	Inspection of water works.
	5	Fort Dodge	Inspection of city wells.
		Iowa Falls	Inspection of city water works.
		Waterloo	Inspection of city water plant, en route.
June	8	Clinton	Inspection of city water works.
	30	Bucknell	Inspection of camp water supply.
		Wanlock	Inspection of camp water supply.
1924			
Feb.	1	Greene	Hearing on pollution of Shell Rock river.
	28	Mason City	Inspection of waste disposal plant of Northern Sugar Corporation.
June	23	Clarinda	Rural typhoid outbreak.
	26	Buffalo Center	Typhoid epidemic.

The number of investigations in the field is considerably less than in the preceding biennium. This is due to the greater proportion of this sort of work taken over by the Sanitary Engineer and his assistant.

OTHER INVESTIGATIONS

Burlington:

The Citizens Water Company of Burlington, has continued to have its plant effluent examined by the water laboratory two or three times a week. In this way it has been enabled to know the condition of its supply throughout the biennium. In general the water supplied to the community has been of excellent quality.

Iowa City:

The special arrangement with the Iowa City Water Company has been continued. Daily examinations of the water supplied to the citizens and to the student body of the University of Iowa have been regularly made. Reports are made weekly to the Company and to the President of the University. By means of this close supervision it has been possible to supply a very satisfactory water most of the time in spite of the fact that the plant was designed as an iron removal plant and is now performing a duty more exacting than that for which it was constructed. At times in the past when the water has been found to be unsatisfactory for drinking purposes, or unsafe for use, the people and student body have been warned promptly by bulletins and through notices inserted in the city and university daily papers.

The water laboratory also supervises the quality of water in the two swimming pools belonging to the University of Iowa. Daily examinations are made during the time the pools are open for use and the treatment of the water is altered according to the situation shown. These examinations are so timed as to get the water from the pool when at its worst. When the pool water becomes too difficult to treat the pool is drained. The number of bathers at the men's pool is very large for the size of the pool and it became difficult to treat the pool without applying excessive doses of chemicals. Therefore, the water laboratory recommended the installation of an ultra violet ray sterilizer to assist in carrying the load of purification. For the purpose for which it was secured the sterilizer has given worth while results, although its cost has been high.

The Emergency Chlorinator:

A portable emergency apparatus for the application of liquid chlorine has been lent the laboratory by the Wallace and Tiernan Company of New York. The apparatus is at the call of any community which is suffering from an epidemic, or which is threatened with one by an unsafe public water supply. The apparatus has been sent out but once, however. In March of 1917, Cedar Falls had an epidemic of diarrhea coincident with the rise of the Cedar River. Chlorine was applied as examinations made at the water laboratory showed the city water to be polluted. Parts of the chlorinator have also been lent to the Iowa City Water Company at times when both of its chlorinators were out of order.

The Extent of the Use of the Water Laboratory:

During the biennium 1922-1924 samples of water have been received from all counties in Iowa. Samples have come in from 562 cities and towns, which happens also to be the number of cities and towns served during the biennium of 1920-1922. City and town supplies of 412 communities have been analyzed. Many more public supplies ought to have had the service of the water laboratory. This service has been offered to all of the mayors of communities in Iowa having public water systems. An effort has been made to reach the officials of other communities, school authorities, and the officers of the county fair boards. In addition an effort has been made to acquaint the public with the service which the state offers the individual taxpayer. The cities and towns which have taken advantage of the opportunity to have examinations made at the laboratory are listed below:

LIST OF CITIES FROM WHICH WATER SAMPLES HAVE BEEN RECEIVED DURING BIENNIUM OF JULY 1, 1922, TO JUNE 30, 1924.

(Cities italicized have had examinations made from the city supply or the supply of public schools.)

Adair county——Adair, *Fontanelle, Greenfield.*

Adams county—*Corning, Nodaway, Prescott.*

Allamakee county—*Church, Harpers Ferry, Lansing,* New Albin, *Postville,* Waterville, *Waukon.*

Appanoose county—*Centerville,* Cincinnati, Moravia, Moulton, Mystic.

Audubon county—*Audubon,* Brayton, *Exira, Gray, Hamlin, Kimballton.*

Benton county—Atkins, *Belle Plaine, Blairstown, Keystone,* Lucerne, *Norway, Shellsburg, Urbana, Van Horne, Vinton,* Walker.

Black Hawk county—*Cedar Falls,* Dewar, Garrison, *Hudson, LaPorte City, Waterloo.*

Boone county—Beaver, *Boone, Boxholm,* Fraser, *Luther, Madrid, Ogden.*

Bremer county—*Janesville, Readlyn, Sumner, Tripoli, Waverly.*

Buchanan county—Brandon, *Fairbank, Independence, Jesup, Quasqueton, Winthrop.*

Buena Vista county—*Albert City, Alta, Linn Grove, Marathon, Newell.*

Butler county—Aplington, *Clarksville, Dumont, Greene, New Hartford, Parkersburg.*

Calhoun county—Farnhamville, *Lake City, Lohrville, Manson, Pomeroy, Rockwell City, Somers.*

Carroll county—*Carroll, Dedham,* Coon Rapids, *Glidden, Halbur, Lanesboro, Manning, Templeton.*

Cass county—*Anita, Atlantic, Cumberland, Lewis, Marne, Massena,* Wiota.

Cedar county—*Bennett, Clarence,* Downey, *Lowden, Mechanicsville,* Plato, *Stanwood, Tipton, West Branch.*

Cerro Gordo county—Clear Lake, *Mason City, Meservey, Rockwell, Thornton.*

Cherokee county—Aurelia, *Cherokee,* Cleghorn, Holstein, Marcus, Meriden, *Quimby.*

Chickasaw county—*Alta Vista,* Bassett, *Fredericksburg, Nashua, New Hampton.*

Clarke county—*Grand River, Murray, Osceola, Woodburn.*

Clay county—Cornell, Dickins, *Everly,* Moneta, Peterson, Royal, *Spencer.*

Clayton county—*Edgewood, Elkader,* Garber, *Guttenberg,* Luana, Marquette, *McGregor, Monona.*

Clinton county—*Calamus, Charlotte, Clinton, Delmar, Dewitt, Grand Mound, Lost Nation,* Lyons, *Wheatland.*

Crawford county—*Arion,* Buck Grove, *Charter Oak, Denison, Dow City, Kiron, Manilla, Ricketts, Schleswig, Vail, West Side.*

Dallas county—*Adel, Dexter, Linden,* Minburn, *Perry, Redfield, Woodward,* Woodward State Hospital.

Davis county—*Bloomfield,* Milton, *Pulaski.*

Decatur county—*Lamoni, Leon,* Pleasanton, Van Wert.

Delaware county—Dundee, *Earlville,* Hopkinton, *Manchester, Oneida, Ryan.*

Des Moines county—*Burlington,* Danville, *Mediapolis, West Burlington, Yarmouth.*

Dickinson county—*Arnold's Park,* Hayward Bay, *Lake Park, Milford, Spirit Lake, Terrill.*

Dubuque county—*Cascade, Dubuque, Epworth, Farley, New Vienna.*

Emmet county—*Armstrong, Estherville.*

Fayette county—*Arlington, Elgin, Fayette, Hawkeye, Maynard, Oelwein,* Randalia, Waucoma, *West Union, Westgate.*

Floyd county—*Charles City,* Marble Rock, *Nora Springs, Rockford.*

Franklin county—Geneva, *Hampton, Latimer, Sheffield.*

Fremont county—*Barlett, Farragut, Hamburg, Imogene, Randolph, Sidney, Tabor.*

Greene county—Adaza, *Churdan, Grand Junction, Jefferson, Scranton.*

Grundy county—Beamen, *Conrad, Dike, Grundy Center, Reinbeck.*

Guthrie county—*Bayard, Guthrie Center, Stuart, Yale.*

Hamilton county—*Blairsburg, Jewell, Kamrar,* Stanhope, Stratford, Webster City, *William.*

Hancock county—*Britt, Corwith, Garner,* Goodell, *Kanawha.*

Hardin county—*Ackley, Alden, Eldora, Iowa Falls,* New Providence, *Radcliffe, Steamboat Rock, Union.*

Harrison county—California Junction, *Dunlap,* Little Sioux, *Logan, Missouri Valley, Persia,* Pisgah, Woodbine.

Henry county—*Mount Pleasant, New London,* Salem, *Wayland, Winfield.*

Howard county—*Cresco, Protivin.*

Humboldt county—*Bode, Livermore.*

Ida county—*Galva, Holstein, Ida Grove,* Washta.

Iowa county—Amana, *Marengo,* Millersburg, Parnell, Williamsburg.

Jackson county—*Bellevue,* Fulton, *Maquoketa, Miles,* Preston.

Jasper county—*Colfax,* Monroe, Newberg, *Newton,* Sully.

Jefferson county—*Fairfield.*

Johnson county—*Iowa City,* Lone Tree, North Liberty, *Solon.*

Jones county—*Anamosa, Center Junction,* Martelle, Monticello, Olin, Oxford Junction, Wyoming.

Keokuk county—*Delta,* Harper, *Hedrick,* Keota, *Richland, Sigourney,* South English, *What Cheer.*

Kossuth county—*Algona,* Bancroft, *Burt, Swea City,* Titonka, *Wesley, Whittemore.*

Lee county—*Fort Madison,* Keokuk, Primrose, Shopton.

Linn county—*Alburnett, Cedar Rapids, Center Point, Lisbon, Marion, Mount Vernon.*

Louisa county—*Columbus Junction, Morning Sun, Wapello.*

Lucas county—*Chariton,* Derby.

Lyon county—*Doon,* George, *Inwood, Lester, Rock Rapids.*

Madison county—Barney, *Earlham,* Peru, Winterset.

Mahaska county—*New Sharon, Oskaloosa,* University Park, Taintor.

Marion county—Harvey, *Knoxville,* Melcher, *Pella, Pleasantville.*

Marshall county—Dillon, *Dunbar, Gilman, Laurel,* Le Grand, *Liscomb, Marshalltown,* Melbourne, *Rhodes,* State Center, St. Anthony.

Mills county—*Emerson, Glenwood, Malvern,* Mineola, Pacific Junction.

Mitchell county—*Little Cedar,* Mitchell, *Osage, Riceville, St. Ansgar, Stacyville.*

Monona county—*Castana, Mapleton, Onawa, Soldier, Ute,* Whiting.

Monroe county—Albia, *Bucknell, Hiteman, Melrose, Rexfield, Wanlock.*

Montgoemry county—Elliott, *Red Oak, Stanton, Villisca.*

Muscatine county—*Muscatine, West Liberty,* Wilton Junction.

O'Brien county—*Calumet, Gaza, Hartley,* Moneta. *Paullina, Primghar, Sanborn,* Sheldon, *Sutherland.*

Osceola county—*Ashton,* Alledorf, *Ocheyedan, Sibley.*

Page county—*Blanchard, Clarinda, Essex, Shenandoah.*

Palo Alto—*Ayrshire,* Curlew, *Emmetsburg,* Mallard, Ruthven.

Plymouth county—*Akron, Hinton, Kingsley, Le Mars, Merrill,* Remsen.

Pocahontas county—*Fonda, Gilmore City, Laurens, Palmer,* Pocahontas, *Rolfe, Varina.*

Polk county—*Ankeny, Bondurant, Camp Dodge,* Des Moines, Maxwell, *Mitchellville, Valley Junction.*

Pottawattamie county—*Avoca, Carson, Council Bluffs, Macedonia, Minden,* Neola, *Oakland, Walnut.*

Poweshiek county—*Brooklyn, Grinnell,* Guernsey, *Montezuma.*

Ringgold county—Delphos, Diagonal, *Ellston,* Mt. Ayr.

Sac county—*Early,* Lake View, *Lytton, Odeboldt, Sac City, Schaller, Wall Lake.*

Scott county—*Bettendorf, Davenport, Dixon,* Donahue, *Elbridge, Le Claire.*

Shelby county—*Defiance, Earling, Harlan, Kirkman, Portsmouth, Shelby,* Westphalia.

Sioux county—*Alton, Boyden, Chatsworth,* Granville, *Hawarden,* Hospers, Hull, Ireton, *Maurice, Orange City,* Perkins, Sioux Center.

Story county—*Colo, Gilbert, Maxwell, McCallsburg, Nevada, Story City, Zearing.*

Tama county—*Chelsea, Clutier, Dinsdale, Dysart, Gladbrook, Montour,* Tama, *Toledo, Traer.*

Taylor county—*Bedford,* Clearfield, *Conway, Lenox.*

Union county—Afton, *Creston, Cromwell, Lorimer.*

Van Buren county—*Birmingham,* Keosauqua.

Wapello county—*Blakesburg,* Eddyville, *Eldon, Farson, Ottumwa.*

Warren county—Carlisle, Hartford, *Indianola,* New Virginia.

Washington county—*Ainsworth, Brighton,* Crawfordsville, *Kalona,* Riverside, *Washington, Wellman,* West Chester.

Wayne county—*Allerton, Corydon,* Humeston, *Seymour.*

Webster county—*Fort Dodge, Gowrie, Lehigh.*

Winnebago county—*Buffalo Center, Forest City,* Lake Mills, Scarville, Thompson.

Winneshiek county—*Calmar, Decorah,* Ridgeway, Spillville.

Woodbury county—Anthon, Battle Creek, *Correctionville,* Cushing, Moville, *Otto, Pierson, Sergeant Bluff, Sioux City, Smithland.*

Worth county—Hanlonton, Kensett, *Manly, Northwood.*

Wright county—*Belmond, Clarion, Dows, Eagle Grove, Goldfield.*

Counties represented 99.

Cities represented 562.

Cities represented by public samples 412.

While most of the work of the Water Laboratory Division has been done on public water supplies, a considerable number of samples are examined each month from private wells. The following table gives the distribution of work undertaken and of the results obtained:

TABLE 9. REPORT FOR 1922-23; 1923-24; WATER DIVISION

Public	1922-23	1923-24	1922-24	1922-23	1923-24	1922-24	1922-23	1923-24	1922-24	1922-23	1923-24	1922-24
	Good			Bad			Doubtful			Total		
Shallow wells	73	134	207	204	151	355	128	108	236	405	393	798
Deep wells	170	206	376	115	86	201	101	64	165	386	356	742
Springs	3	7	10	8	6	14	6	3	9	17	16	33
Treated	623	637	1,260	122	25	147	205	18	223	950	680	1,630
Raw stream	0	0	0	427	418	845	76	0	76	503	418	921
Lakes, etc.	2	0	2	1	3	4	1	0	1	4	3	7
Ice	4	8	12	2	2	4	0	2	2	6	12	18
Cisterns	0	0	0	0	0	0	0	1	1	0	1	1
Miscellaneous	2	0	2	19	0	19	0	0	0	21	0	21
Sewage	0	0	0	7	27	34	4	0	4	11	27	38
Swimming pools	329	452	781	45	40	85	148	50	207	522	551	1,073
Total	1,206	1,444	2,650	950	758	1,708	669	255	924	2,825	2,457	5,282
Private—												
Shallow wells	56	58	114	337	334	671	58	105	163	451	497	948
Deep wells	20	24	44	22	29	51	18	11	29	60	64	124
Springs	2	2	4	4	9	13	0	2	2	6	13	19
Streams	0	0	0	4	3	7	0	0	0	4	3	7
Ice	2	0	2	3	5	8	1	1	2	6	6	12
Cisterns	3	2	5	3	5	8	0	2	2	6	9	15
Miscellaneous	35	1	36	19	2	21	1	0	1	55	3	58
Total	118	87	205	392	387	779	78	121	199	588	595	1,183
Ownership not stated—												
Shallow wells												
Deep wells				1								
Springs												
Streams												
Ice												
Cisterns												
Miscellaneous	1						1					
Total	1	0	0	1	0	0	1	0	0	0	0	3
No data												
Total	1,325	1,531	2,856	1,343	1,145	2,488	748	376	1,124	3,413	3,092	6,468

SPECIAL ATTEMPTS AT PUBLICITY.

Service Letters:

During the current biennium seven mimeographed letters were gotten out and sent to water works operators and city officials in charge of water plants. Each letter was devoted to a single topic, such as iron in water supplies, algae in reservoirs, responsibility for water borne typhoid fever, danger of connecting private and public supplies, and so on. The letters were well received, and a considerable number of requests for them came in.

Public Talks:

During the biennium the following talks on subjects allied to the work of the water laboratory were made by Mr. Hinman:

Date	Place	Subject
July 10, 1922	New Hampton	Rural Water Supplies. Austin Flint (Cedar Rapids Medical Society).
July 18, 1922	Iowa City	Responsibility of the Health Officer in Protecting Public Water Supplies. (Health Officers' Conference.)
Oct. 11, 1922	Ames	Water Supply and Sewage Disposal. (Annual Conference on Sewage Disposal, I. S. C.)
Nov., 1, 1922	Cedar Rapids	Water Purification Plants in Iowa. (Iowa Section, Am. Water Wks. Assn.)
Jan. 8, 1923	Iowa City	The Iowa City Water Works. (Iowa City Engineers' Club.)
Jan. 25, 1923	Des Moines	The Present Status of Water Purification In Iowa. (Iowa Engineering Society.)
June 11, 1923	Des Moines	Water Supply Inspections. (Conference of Inspectors, State Dept. Agriculture.)
Oct. 22, 1923	Ames	Relation of Sewage Disposal to Water Supply. (Annual Sewage Conference, I. S. C.)
Oct. 24, 1923	Ames	Publicity for the Water Works. (Iowa Section American Water Works Assn.)
Jan. 31, 1924	Cedar Rapids	Designing Swimming Pools with Respect to Sanitation and Operation. (Iowa Engineering Society.)
Feb. 26, 1924	Iowa City	Safeguarding Public Water Supplies. (Conference Iowa Secretarial Bureau.)

RECOMMENDATIONS.

The space allotted to the Water Laboratory Division is still far from adequate. Plans have been made for the construction of the New Medical Building of the University of Iowa and more commodious quarters for the Water Laboratory are included in the plans. There will be a period of two or three years intervening before the new laboratory rooms will be available.

Iowa communities will have to turn more and more to surface sources for their water supplies, and for this reason alone there should

be made thorough study of the streams of the state. It is highly desirable that the chief points of contamination of the water shall be located and that immediate steps be taken to bring the water into a condition such that purification plants may reasonably be expected to produce a safe and palatable water from the turbid waters of the stream.

In the laboratory itself extension of the work to the examination of sands, and the mineral analyses of the supplies of state institutions and of the projected supplies of cities and towns is looked forward to as desirable.

EPIDEMIOLOGY DIVISION

John A. C. Busby, B. Sc., M. D., Chief

The following statistics have been compiled from reports of the former chief of this division, Merle R. French, M. D.

From July 1, 1922 to July 1, 1924, the Division of Epidemiology was called upon to make the following number of trips and field investigations:

Diphtheria	17	Tuberculosis	1
Scarlet fever	12	Scarlet fever and Measles	2
Typhoid	9	Gartner or Paratyphoid	1
Poliomyelitis	4	Infectious Conjunctivitis	1
Measles	2	Schick test	5
Whooping cough	1	Encephalitis	1
Impetigo	2	Diphtheria prevention	1
Influenza and Meningitis	1	Rabies	1
Streptococcic sore throat	1	Throat Infection	1
Foot and mouth disease	1	Vulvo-vaginitis	1

Addresses, etc., 9.

DIPHTHERIA

As will be noted, diphtheria heads the list in greatest number of investigations required. This department has been particularly interested in the subject of diphtheria for several reasons—because of its frequent occurrence, because of the severity the disease may assume, but especially because of the prophylactic measures which may be taken against the disease. These prophylactic measures, the Schick test, and the administration of toxin-antitoxin have been stressed whenever opportunity afforded itself. In one instance, for example, all the children of school age and pre-school age and some adults in four townships in Clinton county were given the Schick test and those found susceptible to diphtheria given toxin-antitoxin. With respect to the carrier problem the attitude of this department is, that during epidemics certain restrictions must be placed upon carriers, however, the only sure and proper method, since many carriers will be missed, is to stringently carry out the prophylactic measures mentioned above—the Schick test and toxin-antitoxin administration.

The following diphtheria investigations are arranged in chronological order.

Calamus—Aug. 3, '22. Due to the fact that cases of diphtheria had been cropping out for several months because of the mild type of the disease and often a physician was not summoned, and because of lack of observance of quarantine regulations, the community requested an investigation, since it was near the time for the opening of school. Community interest was aroused, quarantine more closely observed, and daily examination by a competent nurse of school children was advised. On September 6th, the mayor requested another visit to Calamus to discuss and explain the situation to the general public. At a community meeting the whole subject was again reviewed and recommendations given.

Toledo—Aug. 7-12, '22. In accordance with arrangements made with the Board of Control all the children in the State Juvenile Home were given the Schick test. From 129 children, 8 were found positive, 21 combined (positive and pseudo), 18 pseudo and 82 negative. Toxin-antitoxin was advised for those found positive and those having combined reactions.

Low Moor—Sept. 19, '22. A few cases of diphtheria occurred during the summer months but upon the opening of school it became epidemic and of a virulent type. The community was called together at the school house, the situation discussed and the usual recommendations given.

Similar outbreaks of diphtheria were investigated and in general, similar recommendations given to the following towns: Klemme, Wellman, Manilla, Carroll, West Side, Merrill, Seymour, Numa, Waukee, Bancroft, Little Rock.

Two outbreaks in hospitals were investigated, the first at the Ottumwa hospital, March 30, 1923, and the second at Des Moines in the Mercy hospital, April 16, 1924.

Clinton—During December, 1923, and January, 1924, the children of Camanche, Eden, Elvira and Low Moore townships were given the Schick test and those found positive were given toxin-antitoxin. From 380 children given the Schick test, 119 were found positive. One hundred ninety-three toxin-antitoxin administrations were made, 68 of the number being to children of pre-school age.

SCARLET FEVER

As is well known the diagnosis of scarlet fever is often attended with difficulty, particularly in mild types of the disease and also when the case is seen after the disappearance of the rash and before desquamation has occurred. It is in such instances in particular and frequently also when a physician has seen a case during the erythematous stage and a neighboring physician has seen the case a few days later when it has lost its typical appearance, that misunderstandings arise in a community and the services of this department are requested. The following towns were visited because of scarlet fever: Millersburg, Janesville, Toledo (State Juvenile Home), Kalona, Shannon City, Brighton, Lewis, Earlville, Earlham and Waterloo.

TYPHOID FEVER

There were only nine epidemiological investigations of typhoid fever during the past biennium. These investigations consisted of securing careful history of the outbreak, determining as far as possible the origin and the mode of transmission, the search for carriers, written recom-

mendations for controlling the disease and particularly the stressing of typhoid inoculation as a prophylactic measure. Such investigations were carried out in the towns of Fairfield, Davenport (St. Vincent's Orphanage), Webster City, Chariton, Oelwein, Clarinda, Buffalo Center and Boone.

POLIOMYELITIS

No extensive outbreaks of poliomyelitis occurred in the state during the past two years. Epidemiological investigations were required in four communities: Grundy Center, Prairie City, Lisbon and Marshalltown.

A few diseases have required only two investigations during the past biennium. Two investigations were made for measles complicating scarlet fever, one at Janesville and the other at Maxwell. Two investigations were made for impetigo—one at West Chester, the other at Mitchelville.

Quite a number of conditions have necessitated only one investigation the past two years. In this list are the investigations for whooping cough at Remsen; influenza and meningitis at Garwin; streptococcic sore throat at Melbourne; foot and mouth disease at Keokuk; tuberculosis at Storm Lake; paratyphoid at Wellman; infectious conjunctivitis at Camanche; encephalitis lethargica at Huxley; rabies at Mt. Ayr; vulvovaginitis at Davenport.

Aside from investigations by this department, addresses were delivered in the following cities: Davenport, Indianola, Des Moines, Fort Dodge and Centerville.

Table No. 10 given below is a summary of the trips made by members of the staff in the interest of the public health:

TABLE 10. SUMMARY OF EPIDEMIOLOGICAL FIELD INVESTIGATION

TABLE 10.—Continued

Date 1922	Type of Investigation	Town or City	Disease	Probable Mode of Spread	By Whom Investigated
July 3	Field	Mt. Ayr	Rabies	Contact	French
July 6	Field	Grundy Center	Poliomyelitis		French
July 6	Field	Waterloo	Scarlet fever	Mild cases	French
Aug. 3	Field	Calamus	Diphtheria	Mild cases	French
Sept. 7-12	Field	Toledo	Schick T.		French
Sept. 6	Field	Lisbon	Poliomyelitis		Griswold
Sept. 28	Field	Mitchellville	Schick T.		French
Sept. 2	Field	Calamus	Diphtheria	Carriers	Griswold
Sept. 6-7	Field	Woodward	Schick		French
Sept. 7-9	Field	Glenwood	Schick		French
Sept. 10-20	Field	Eldora	Schick		French
Sept. 22-28	Field	Klemme	Diphtheria	Mild cases	Griswold
Sept. 8	Field	Elvira	Diphtheria	Contact	Griswold
Sept. 19	Field	Low Moor	Diphtheria	Contact	Griswold
Sept. 20	Field	Fairfield	Typhoid	Water	Griswold
Sept. 7	Field	Huxley	Encephalitus		Griswold
Sept. 9	Field	Wellman	Diphtheria	Carrier-mild cases	Griswold
Oct. 4-9	Field	Manilla	Diphtheria	Mild cases	French
Oct. 10	Field	St. Vinc. Orphange, Davenport	Typhoid	Contact	French
Oct. 13	Field	Carroll	Diphtheria	Carrier	French
Oct. 1-20	Field	West Branch	Diphtheria	Contact	French
Oct. 20	Field	Webster City	Typhoid	Contact	French
Oct. 31	Field	Seymour	Diphtheria	Contact	French
Nov. 7-8	Field	Numa	Diphtheria	Carrier	French
Nov. 7-9	Field	Merrill	Diphtheria	Contact	French
Nov. 13-14	Field	Waukee	Diphtheria	Contact	French
Nov. 13	Field	Remsen	Whooping cough	Contact	French
Nov. 14	Field	Centerville	Address		Griswold
Nov. 15	Field	Albia			
Nov. 20	Field and laboratory	Soldiers' Orphans' H., Davenport	Gon. and Vag.	Contact	French
Nov. 25	Field	Davenport	Address		Griswold
Nov. 25	Field	Indianola	Address		French
Dec. 5	Field	Des Moines	Address Quarterly Cnf. B. of C.		French
Dec. 23	Field	Davenport	Address Diphtheria		
Dec. 26	Field	Washington	Estab. Lab.		Griswold
Dec. 28	Field	Clinton	Scarlet fever		Griswold

Date 1923	Type of Investigation	Town or City	Disease	Probable Mode of Spread	By Whom Investigated
Jan. 8- 9	Field	Camanche	Infect. conj.	Contact	French
Jan. 16	Field	Millersburg	Scarlet fever	Undetermined	French
Feb. 6	Field	Janesville	Scarlet fever and measles	Contact	French
Feb. 12	Field	Juvenile Home. Toledo	Scarlet fever	Contact	Griswold
March 16	Field	Maxwell	Scarlet fever and measles	Contact	French
March 24	Field	Ft. Dodge	Address North Cent. Teach. Association		Griswold
March 30-31	Field	Ottumwa	Diphtheria	Contact	French
April 19	Field	Huxley	Smallpox and chicken pox	Contact	Griswold
April 24	Field	Rockwell City	Womans Reformatory. Toxin anti-scarlet fever	Contact	French
April 29	Field	Kalona	Scarlet fever	Contact	Griswold
May 18	Field	Melbourne	Strept.	Undetermined	French
May 26	Field	Garwin	Flu. and Mening.	Contact	French
June 1	Field	West Chester	Impetigo, contagiosa	Not known	French
July 1	Field	Wellman	Gartner or paratyphoid	Swimming pools	French
Aug. 9-10	Field	Charlton	Typhoid	Milk	French
Aug. 22	Field	Prairie City	Poliomyelitis		French
Aug. 24	Field	Marshalltown	Poliomyelitis	Contact	French
Aug. 30	Field	Kalona	Scarlet fever	Contact	Griswold
Sept. 11	Field	Oelwein	Typhoid fever	Milk	Griswold
Oct. 12	Field	Mitchellville	Impetigo, contagiosa	Contact	French
Nov. 20	Field	Oakdale	Meningitis	Contact	French
Nov. 23-24	Field	Brighton	Scarlet fever	Contact	French
Dec. 2-4	Field	Storm Lake	Tuberculosis		French
Dec. 3-5	Field	Bancroft	Diphtheria	Contact	French
Dec. 4	Field	Boone	Typhoid fever	Water	French
Dec. 17	Field	Toledo	Throat infection	Contact	French
Dec. 26	Field	Woolstock	Scarlet fever		Griswold
1924					
Jan. 10-15 & 17	Field	Oelwein Co., Elvira and Lowmoor	Typhoid	Milk	Griswold
Jan. 14	Field	Clinton	Diphtheria	Contact	Griswold
Jan. 29-30	Field	Little Rock	Investigation stream pollution		Griswold
Jan. 31	Field	Greene	Record for fumigation		Griswold
Feb. 18	Field	Readlyn	Scarlet fever		Griswold
Feb. 21	Field	Lewis	Scarlet fever	Contact	Griswold
March 18	Field	Earlville	Scarlet fever	Contact	Griswold
April 11	Field	Iowa City	Measles		Griswold
April 16-19	Field	Des Moines, Mercy Hospital	Diphtheria		Griswold
April 20	Field	Earlham	Scarlet fever (mild cases)		Griswold
April 28	Field	Keokuk	Supposed foot and mouth dis.	Contact	Griswold
June 23	Field	Near Clarinda	Typhoid	Carrier or water	Hinman
June 26	Field	Buffalo Center	Typhoid	Water	Hinman

TABLE 11. EXAMINATIONS MADE AT BRANCH LABORATORIES

Locality	Diphtheria		Typhoid		Tuberculosis		Miscellaneous		Total
	1922-23	1923-24	1922-23	1923-24	1922-23	1923-24	1922-23	1923-24	
Ames	413	1,157	0	119	7	9	200	43	1,948
Burlington	395	288	0	19	82	120	234	552	1,690
Carroll	50	0	0	0	0	0	104	66	220
Cedar Rapids	460	346	19	1	74	112	169	91	1,272
Clinton	0	537	0	1	0	10	0	37	585
Creston	0	0	0	0	0	0	0	0	0
Des Moines	6,719	2,680	0	0	20	23	967	1,176	11,585
Dubuque	1,261	2,457	0	2	73	65	2,285	621	6,764
Ft. Dodge	761	482	14	9	47	49	3	4	1,369
Grinnell	222	47	9	4	14	26	28	33	383
Mason City	3,272	2,069	0	6	76	69	177	193	5,862
Sioux City	4,110	4,039	0	15	80	100	2,442	4,696	15,482
Washington	67	1,448	0	0	2	8	11	34	1,570
Total	17,730	15,550	42	176	475	591	6,620	7,546	48,730

Grand total for the biennial period, 48,730.

RECORDS DIVISION

Minnie Hamilton, Chief

The Record Division is an outgrowth of the four divisions of the Laboratories for the State Board of Health: Diagnostic, Venereal, Epidemiology, and Water Laboratory. It was established July 1, 1921, by the Director of Laboratories, Don M. Griswold. Its increase is in proportion to the combined increase of these four divisions.

A young woman taking the position of stenographer and clerk, was added to the staff in July, 1923. At this time part of the clerical work was being done in the State Laboratory by members of the laboratory staff. This work was then added to the work of this division. There have been two changes in the personnel since the Record Division was established. At present the staff consists of four persons.

Report blanks are used for sending out reports from all the divisions. These blanks are designed especially with the idea of making them (1) complete, (2) definite, and (3) brief. It is not practical, however, to send out all reports by a general form, as in some cases it is necessary to go somewhat more into detail than could be covered by a report blank. This is especially true with rabies and miscellaneous reports from the bacteriological laboratory. Such reports are sent by letter.

The following table shows approximately the number of reports sent out by report blank and by letter, except in the case of epidemiology, which reports are written according to a regular form:

	1922-23	1923-24	Total
Bacteriological Laboratory			
Report blanks	45,168	35,285	80,453
Letter reports	246	251	497
Wassermann Division	32,114	40,847	72,861
Water Laboratory	1,630	1,764	3,394
Epidemiology	43	28	71
	79,201	78,175	157,276

In comparing the number of containers sent out from the water laboratory to the number of water reports sent out from the record division, it will be seen that there is a difference in favor of the number of water reports sent out. This is accounted for by the fact that the water containers contain one, two, or three bottles, as the case may be. It will also be seen that more samples were received in 1923-24, but less containers were sent out than during 1922-23.

The difference in the total amount of water examinations made and the number of reports sent out, is due to the fact that the total examinations include the city water and swimming pools of Iowa City and the university, which reports are not covered by a regular blank.

The tables contained in this biennial report show by tabulation the summaries of all examinations made in and authorized by the Laboratories for the State Board of Health. The work of the divisions of the laboratories is collected monthly. Monthly summaries are filed in these offices and with the secretary-executive officer, at Des Moines, Iowa.

Table No. 11 shows the work of the branch laboratories. These reports are collected by monthly request cards sent to the several branch laboratories. The work of the branch laboratories is not included in the total summaries showing the volume of work done, as it does not indicate any work done here, except that which is handled in the Records Division.

Statement cards designed to show the number of outfits on hand and at the same time, a request for new outfits, are mailed to each of the outfit stations over the state, numbering approximately 1,000. The summer months have been the most convenient time for this work to be handled in the offices of the Record Division.

Form letters are being sent out now and then to the doctors over the state, with a view of conveying information regarding laboratory diagnoses; the different kinds of examinations made at the laboratories; and in general, a survey of the work that is being offered in the interest of the public health.

A summary of the work of the biennium, and the annual and biennial volume of work since the establishment of the laboratory, are given below:

SUMMARY OF THE WORK OF THE BIENNIUM

Laboratories for the State Board of Health

(Branch Laboratories not included.)

	1922-23	1923-24	Summation	Total
I Diagnostic Division—				
a. Outfits distributed	88,327	72,909	161,236	
b. Specimens received:				
Diphtheria	39,624	29,477	69,101	
Typhoid	1,588	1,710	3,298	
Tuberculosis	3,956	4,098	8,054	
Rabies	101	153	254	
Meningitis	18	9	27	
Miscellaneous	127	89	216	
Total	133,741	108,445	Summation	242,186
II Wasserman Division—				
a. Outfits distributed	33,320	38,328	71,648	
b. Specimens received:				
Blood	38,629	37,617	66,246	
Spinal fluid	981	994	1,975	
Gonorrhea	2,491	2,225	4,716	
Bac. of Ducrey	2	3	5	
Spirochete	11	8	19	
Total	65,434	79,175	Summation	144,609
III Water Analysis Division—				
Containers sent out	1,075	1,057	2,132	
a. Water	3,390	3,007	6,397	
b. Ice	12	18	30	
c. Sewage	11	27	38	
Total	4,488	4,109	Summation	8,597
IV Epidemiology Division—				
Investigations:				
Field	42	27	69	
Trips made in the interest of the public health other than investigations	5	1	6	
Total	47	28	Summation	75
V Records Division—				
Bacteriological Laboratory:				
Report blanks	45,168	35,285	80,453	
Letter reports	246	251	497	
Wassermann Division	32,114	40,847	72,861	
Water Laboratory	1,630	1,764	3,394	
Epidemiology	43	28	71	
Total	79,201	78,175	Summation	157,376
Grand total	282,911	269,932		552,843

ANNUAL AND BIENNIAL VOLUME OF WORK SINCE ESTABLISHMENT OF LABORATORY

(Including Reports Sent Out from Records Division, 1922-23-1923-24.)

Year	Fiscal Period	Volume	Biennium	Volume
1	July 1, 1904—June 30, 1905	3,580	1st	8,779
2	July 1, 1905—June 30, 1906	5,199		
3	July 1, 1906—June 30, 1907	8,423	2nd	17,289
4	July 1, 1907—June 30, 1908	8,856		
5	July 1, 1908—June 30, 1909	10,437	3rd	22,961
6	July 1, 1909—June 30, 1910	12,524		
7	July 1, 1910—June 30, 1911	13,437	4th	27,078
8	July 1, 1911—June 30, 1912	13,641		
9	July 1, 1912—June 30, 1913	17,464	5th	35,432
10	July 1, 1913—June 30, 1914	17,968		
11	July 1, 1914—June 30, 1915	14,091	6th	40,486
12	July 1, 1915—June 30, 1916	25,795		
13	July 1, 1916—June 30, 1917	25,752	7th	46,880
14	July 1, 1917—June 30, 1918	29,128		
15	July 1, 1918—June 30, 1919	43,715	8th	129,705
16	July 1, 1919—June 30, 1920	85,989		
17	July 1, 1920—June 30, 1921	108,662	9th	298,978
18	July 1, 1921—June 30, 1922	190,316		
19	July 1, 1922—June 30, 1923	282,911	10th	552,843
20	July 1, 1923—June 30, 1924	269,932		