INDEX

STATE OF IOWA
1922

REPORT OF THE

STATE BOARD OF HEALTH

FOR THE

BIENNIAL PERIOD ENDING JUNE 30, 1922

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 twentieth biennial report of the State Board of Health for the period commencing July 1, 1920, and ending June 30, 1922.

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

Des Moines, December 31, 1922.

REPORT OF THE STATE BOARD OF HEALTH

INTRODUCTION: PUBLIC HEALTH PROGRESS IN IOWA.

The Iowa State Board of Health was created in the year 1880, prior to which time the general impression prevailed that the doctor's work was limited to sick people; that no one had any use for a doctor until he had contracted some disease and that the diseases which afflicted men and women were due to mysterious causes which could not be controlled. We know better now. Those diseases which, up to fifty years ago, were called plagues and pestilences are now called preventable diseases. We recognize today that they are due to causes beyond the control of the individual and that consequently they must be controlled by the state.

Today the Iowa State Board of Health represents a number of departments in its organization and work, part of which have been forced on it by legislation and part developed as a result of consideration of health problems confronting it in Iowa.

The activities of the board are now represented by the following:

(a) Administration
(b) Communicable Disease
(c) Sanitary Engineering
(d) Housing
(e) Vital Statistics
(f) Venereal Disease
(g) Laboratories
(h) Epidemiology
(i) Public Health Nursing
(j) Hotel and Restaurant Inspection
(k) Human Antitoxins and Vaccines
(l) State Licensure
    Physicians and Surgeons
    Nurses
    Embalmers
    Optometrists
    Podiatrists

The administrative work is directed from the office of the secretary of the board in the capitol. It consists of correspondence, conferences, advice, investigations, special work and educational campaigns. The possibilities along these various lines are controlled entirely by the funds at the disposal of the board for such work.

It is an established fact that the prevention of disease and the maintenance of health are now recognized as business propositions and trained experts are called upon to minister to the different phases of the work.

In the early days of its existence the lines followed were those ordinarily pursued in meeting conditions which arose from time to time, but in later years there has been an unparalleled development of sciences which contribute to the public health, and people today, as never before, realize the importance of public health measures, and are demanding such protection from the vast economic losses and incalculable suffering caused by preventable diseases, that our responsibilities have increased.

WHAT IS PUBLIC HEALTH?

Public health is the science and art of preventing disease, prolonging life and promoting physical health and efficiency through organized efforts of state and local health boards for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal hygiene, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will insure to every individual in the community a standard of living adequate for the maintenance of health.

When we can have the people conceive of public health in these terms, results will be different from those resulting from the exercising of police power, for it is true in Iowa as in other states that the people have looked upon the boards of health in the past as police power and have believed that this power should be applied to local conditions and difficulties *only* when they arise.

In each community we have a local board of health and our official and non-official health agencies. The state board of health transmits through these organizations practical conclusions to each person in the community, which gives to the public an understanding as to the facilities available in the state, and their legal and common responsibilities in the prevention of disease.

SANITARY ENGINEERING

Its duties are to make inspections of the public water supplies, sewer systems, sewage treatment plants and garbage and refuse disposal plants throughout the state, and direct the method of installation and operation of the law. It furthermore makes it a duty to

make inspection of the sanitary conditions in any locality of the state upon written petition of five or more citizens from said locality, and issue direction for the improvement of the same, which shall be executed by the local board.

Naturally as this is all sanitary engineering work it all falls upon the engineering department.

At first reading of the report which appears in the biennial the amount of work connected to their duties may not mean much to the average reader. But when you stop to consider that there are over 900 cities and towns in the state of Iowa of which 500 have water systems, 185 have sewage treatment plants, and not considering all the garbage dumps and disposal plants the work amounts to rather formidable figures.

During the past year made inspection of ninety-three places. Every one of these places made a request to the board of health for the services of the engineer and investigations consisted of finding sources of public water pollution, discovering trouble with unruly sewage treatment plants or taking care of unsanitary conditions in response to petitions. Eighty-nine counties out of ninety-nine in the state were covered during these inspection trips, so some idea may be had of the number of miles it was required to travel to take care of the needs of the state.

Sanitary engineering work is of a rude nature, that is, it requires constant effort and inspections to raise the state to a higher level. Often times just when a council learns all about how to run a sewage treatment plant or have learned to insist on proper garbage disposal a new council comes in who must be taught all over again. Who is the rightful or logical teacher of the state in all these matters of sanitation but the sanitary engineer. Nine times out of ten if he is not called upon to do this instructive work a council allows conditions to get so bad that he is often called in later by disgusted citizens. There is not one town in the state that cannot find something every year that might be done to help living conditions and which are often never done because their attention is not called to it.

HOUSING

The housing department of the state board of health, under the able direction of Edwin H. Sands, has the administration of the housing law enacted by the thirty-eighth general assembly, which aims to promote the health, welfare and safety of the public through a regulation of the light, ventilation, sanitation and fire protection

in residences. This act is mandatory in all cities of 15,000 or more.

The state board of health has adopted rules and regulations applicable to extra bad conditions existing in residential places throughout the state and the enforcement of same is placed in the housing department.

The housing act also placed the health and sanitary conditions of the mining camps of the state in the housing department for enforcement and give this department authority to supervise the erection of all new mining camps created, with a view to the elimination of the numerous undesirable factors which have heretofore existed in mining camps.

The thirty-eighth general assembly also authorized the appointment of a committee to assist the state board of health in the drafting of a plumbing code for the state of Iowa. The enforcement of this code was placed under the department of housing by the state board of health in April, 1922.

VITAL STATISTICS

The collection of vital statistics is by law placed under the secretary of the state board of health as state registrar. Although Iowa has been collecting vital statistics returns on births, deaths, marriages and divorces since 1880, it was not until 1921 that we had a law and system recognized sufficiently to insure complete returns. Under the present law and system Iowa will be recognized by the United States census bureau as a registration state as soon as we have operated under the law a sufficient length of time that a checking may be made by the United States census bureau to ascertain if the enforcement of the law has been faithfully carried out and the required percentage of returns recorded. We are now having the death records checked for the purpose of being admitted to registration area for deaths, and the work of checking birth records will be started by the bureau in the very near future. If the required percentage of returns have not been reported and recorded under the present law, it will not be due to any defect in the law, but will be due to neglect of certain individuals to make reports.

It is assumed by some persons that all these records are to be used for is purely for statistical purpose in the office of the state board of health. No one will deny their value for statistical purposes in public health work; but they have an equal importance in a legal and historical respect, and after being properly indexed and classified the original records are placed in fire-proof cases in our state

historical department where they will not only serve now but will be preserved with all reasonable protection for future generations.

VENEREAL DISEASE

This division assists in the organization and conduct of venereal disease clinics in the state, where people suffering from venereal infection can receive treatment free. Twelve such clinics are now operating in the state, in the following cities: Des Moines, Dubuque, Clinton, Fort Dodge, Mason City, Grinnell, Sioux City, Ottumwa, Council Bluffs, Marshalltown, Davenport and Manly.

A free clinic for the indigent suffering with venereal disease should be provided in every large city and in every county of the state. Hospital facilities should be available for all cases requiring hospitalization either for their own welfare or for what is of greater importance, the protection of the public from individuals running at large suffering with venereal disease.

The division arouses public interest in the effort of local officials in the enforcement of the laws against social vice; it carries on an extensive educational work through the schools of the state, holds public meetings of various kinds, of an educational nature, distributes free arsphenamine to clinics, provides ways and means whereby prostitutes and those whose conduct is of such a character as to spread venereal infection may be quarantined.

The universities and colleges should train teachers in sex hygiene, in order to qualify them to give instructions to the children. State, county and municipal officers must all cooperate and each do his full part in the work. Physicians must all be made to realize their full duty. The clergy, the press, and in fact everyone has a part to play if the results are going to be what they should. Our volunteer welfare organizations through advice and assistance are being made important factors in this work by the co-ordination of their efforts.

EPIDEMIOLOGY

The division of epidemiology was created in connection with our laboratories, and upon request from any community or institution a trained expert is sent for the purpose of assisting local health officials in outlining and enforcing measures for the prevention or abatement of disease and possibly epidemics. Since the creation of this epidemiological service, it has been possible for the board to give a greater amount of aid to local boards of health and greater efficiency has been secured in this way in the control of communicable

diseases. There is great opportunity for further development along these lines. To carry out this work more effectively, there should be whole time health officers in all of the larger municipalities and whole time county health units with their authority extending over the surrounding territory, in such a way as to cover the state with efficient local sanitary supervision.

In this report will be found a list of communities that were extended aid from our epidemiological division.

COMMUNICABLE DISEASES

In each community in the state the attending physician notifies the local health officers of a case by a regular reporting government franked post card for infectious diseases. The local health officer, after carrying out the measures prescribed in the regulations for the control of the disease, mails the report to the secretary of the state board of health. The secretary reports weekly to the surgeon general of the United States public health service, and after obtaining working information from the reports, same are turned over to division of epidemiology.

SCHOOL LOSSES DURING EPIDEMICS

The unnecessary closing of schools on account of epidemics of preventable diseases is a factor worth considering in public health work. In rural districts where only a few families are represented in a school and the children are kept at home while the school is closed, this method may be effectual and economical, but only in certain diseases. In cities, villages and consolidated rural schools the loss in time and money due to the closing of school is not justified by the results because the children associate with each other elsewhere and the detection of mild, unrecognized or concealed cases is made very difficult. When the schools are kept open and proper supervision is maintained these cases are quickly recognized, excluded from school, their families investigated and precautions taken against the spread of the disease.

One child of every five children in school is absent every day from preventable disease.

State board of health regulations define the duties of school and health officers in the protection of the health of school children while in school, and every school has been furnished with communicable disease charts containing detailed information regarding the early signs and symptoms and method of handling each disease common in our state.

PLANS FOR RURAL PUBLIC HEALTH WORK

We believe that the solution of the state-wide rural health situation in Iowa lies in the provision for whole-time county health units or organizations. Each county unit to have as its personnel one director (health officer, whole time), at least two registered nurses (preferably special training for public health work) and one clerk. The director shall be both health officer and medical supervisor. Such officer should have special training in public health work, should be approved by the state board of health, should be responsible to the state board of health and should be removed only on charges and only after a hearing in his district, before the state board of health in session.

His duties in his own county would be to receive reports of infectious diseases, to supervise quarantine, isolation, to supervise regulations regarding the exclusion of infectious persons from school, to supervise the sale of milk, food, etc., from or by infected families or persons, to trace mild, unrecognized or concealed cases, to investigate alleged sources of infection, and in general to take all necessary measures to detect and prevent spread of infectious diseases. He should have full authority to direct and correlate all health work carried on by any organization, official or non-official in the county. He should confer with and advise local boards of health and health officers concerning sanitary problems, but would not supersede them although his advice should be mandatory concerning infectious diseases. The distribution of antitoxin, the medical supervision of schools and similar measures would be under his direction, subject to the regulations of the state board of health. He would have nothing to do with the treatment of cases other than perhaps indigent poor although he would call attention to the need of such treatment by a practicing physician, when mild, unrecognized or concealed cases are discovered by him.

The nurses would be the director's assistants and would work under his direction in making all investigations and surveys.

The sum of $10,000.00 will support the expenses of such a county unit in the ordinary county with no large cities.

PUBLIC HEALTH NURSING

The Iowa state board of health in July, 1921, created a bureau of public health nursing and appointed a director of public health nurses, whose salary and expenses are paid by the Iowa Tuberculosis Association. Because the work of this voluntary bureau has proven

of value to the state board of health and to the state as a whole, the board desires to make it a permanent bureau. Below is given some of the activities of the bureau which have proven its right to be perpetuated:

1. Provided a means of reaching every public health nurse in the State.

2. Brought about a closer relationship between public health nurses and each department of the board of health, so that the board has an additional channel through which it may function.

3. Has provided public health nurses for communities.

4. Has been able to secure on short notice, nurses with experience in contagious diseases for communities where an epidemic was threatened.

5. By keeping in close touch with nurses through visits, correspondence, and bulletins, and by conferences and meetings, has raised the standard of the work of public health nursing in Iowa.

6. Provided forms for recording the work of nurses locally and for a monthly report to the bureau.

7. Statistics secured from these reports provide material and suggestions for future plans and for steady improvement of the service. These reports also give figures which show the economic value of the nurses' services.

N. B. Figures compiled by the state university of Iowa two years ago showed that children in city schools were healthier than those in rural schools. Figures secured from nurses monthly reports show that in communities where there has been a nursing service for two years, rural children are in as good physical condition as city children.

8. Figures also show that amount of absence is greatly lessened where there is a nursing service.

9. Through the close touch which the Iowa Tuberculosis Association has with every county in the state, the bureau has been able to bring about a better understanding of the state board of health and its functions and a very friendly feeling toward the Board.

10. Through the director, a disaster relief nursing unit has been organized in Polk county available to the state in case of an emergency or disaster.

11. Has provided speakers for such groups as chamber of commerce, farm bureaus, P. T. A., women's clubs, and school groups whereby the activities of the board have been made clear to great numbers of people.

12. Through cooperation with state board of public instruction, Iowa university, Ames college, as well as national organizations, much health education has been disseminated through schools and communities.

13. The bureau has received recognition nationally through the appointment of the director as chairman of the nursing section of the National Tuberculosis Association and by her elections as chairman of the tuberculosis section of the national organization of public health nursing and to the board of directors of the national organization of the public health nursing. In the state by the appointment of the director on important committees in various state organizations; namely, parent-teacher association, Iowa league of Women Voters, Federation of Women's Clubs, State Nursing Association, etc.

The state department of health does not ask for additional appropriation to carry on this valuable work, but desires permission to use funds which usualy revert to the general fund.

COMMUNICABLE DISEASES IN IOWA

Number Reported for Iowa, by Months, Biennial Period Ending June 30, 1922

	Cerebrospinal meningitis	Diphtheria	Poliomyelitis (Infantile Paralysis)	Scarlet Fever	Smallpox	Chickenpox	Measles	Mumps	Whooping Cough	Pneumonia	Tuberculosis	Rabies	Typhoid Fever	Spanish Influenza
1920														
July	3	53	0	83	210	25	58	8	48	4	9	0	5	0
August	0	60	0	78	165	12	16	0	34	0	1	0	4	0
September	1	97	7	150	121	2	12	7	68	1	6	0	13	0
October	2	13	192	325	243	38	25	4	104	6	4	0	17	2
November	2	193	6	432	575	67	53	24	216	14	4	0	13	0
December	4	208	9	489	827	101	82	22	70	11	9	0	8	7
1921														
January	7	149	1	615	1,116	219	160	29	100	7	5	0	2	2
February	1	138	0	542	1,133	162	526	70	88	17	7	0	0	12
March	4	102	3	485	1,022	138	553	54	15	13	4	0	0	0
April	2	141	1	414	704	100	441	15	40	10	5	0	4	4
May	2	98	2	249	567	49	206	5	12	1	4	0	2	0
June	2	70	2	138	234	43	52	9	36	6	2	0	15	0
Total for the year	30	1,322	215	3,980	6,677	976	2,184	293	825	47	52	0	83	27
1921														
July	0	54	10	48	69	6	11	0	20	1	8	0	7	0
August	11	66	48	89	18	1	0	2	12	2	6	1	21	0
September	5	281	58	179	11	1	2	0	1	2	0	0	12	0
October	2	375	28	530	45	9	3	0	3	1	0	0	4	2
November	3	323	11	517	95	69	5	4	2	1	0	0	0	1
December	1	256	5	529	170	64	7	4	1	9	3	3	5	
1922														
January	4	237	0	450	223	75	18	12	2	22	1	0	2	0
February	3	99	3	339	157	36	11	9	2	8	1	0	1	2
March	2	75	2	279	130	27	11	6	1	7	2	0	0	18
April	2	53	0	169	57	34	18	4	1	7	0	0	2	0
May	1	40	2	113	76	8	13	8	0	0	0	0	4	0
June	2	62	0	85	44	7	19	3	1	0	0	0	2	0
Total for the year	36	1,922	167	3,227	1,104	337	118	52	47	58	28	4	60	23

FINANCIAL STATEMENT FOR BIENNIAL PERIOD JULY 1, 1920—JUNE 30, 1922.

State Board of Health—	
Appropriated for biennial period	$20,000.00
Expended for biennial	9,020.98
Unused balance returned to general revenue	$10,979.02
Bacteriological Laboratory—	
Appropriation for biennial period	$24,495.89
Expended for biennial	24,495.62
Unused balance returned to general revenue	.27
Antitoxin Department—	
Appropriation for biennial period	$ 4,000.00
Expended for biennial	3,783.15
Unused balance returned to general revenue	$ 216.85
Vital Statistics Department—	
Appropriation for biennial period	$13,000.00
Expended for biennial	12,981.55
Unused balance returned to general revenue	$ 18.45
Housing Department—	
Appropriation for biennial period	$10,000.00
Expended for biennial	9,530.45
Unused balance returned to general revenue	$ 469.55
Medical Examiner's Department—	
Amount fees paid treasurer during biennial period	$ 6,850.00
Expended for biennial	1,493.29
Unused fees returned to general revenue	$ 5,356.71
Optometry Department—	
Amount in fees carried forward June 30, 1920 (2583-s)	$ 500.00
Amount fees paid Treasurer during biennial period	2,155.00
Expended for biennial	853.08
Carried over June 30, 1922 (2583-s)	500.00
Amount unused fees returned to general revenue	$ 1,301.92

Podiatry Department—	
Amount fees paid Treasurer during fiscal year 1921-22	$ 815.00
Expended for fiscal year	239.73
Amount fees carried forward June 30, 1922	$ 645.27
Nurses' Department—	
Amount fees carried over June 30, 1920	$ 5,326.51
Amount fees paid Treasurer during biennial	6,263.00
Expended for biennial	2,946.45
Amount carried over by chapter 249—39th General Assembly	500.00
Amount unused fees returned to general revenue	$ 8,143.06
Embalmers Department—	
Amount fees paid Treasurer during biennial period	$ 3,867.00
Expended for fiscal year	2,218.66
Amount unused fees returned to general revenue	$ 1,648.34
Plumbing Department—	
Amount in fees available July 1, 1920	$ 453.15
Amount in fees paid Treasurer during biennial period	311.00
Expended for fiscal year	9.40
Amount in fees available July 1, 1922	$ 754.75
Maternity Hospital—	
Amount in fees paid Treasurer during biennial	$ 25.00
Amount unused fees returned to general revenue	$ 25.00
Hotel Inspection—	
Amount fees collected and paid treasurer during biennial	$41,610.50
Expended for biennial	35,286.39
Amount in fees available July 1, 1922	$ 6,324.11
Venereal Disease—	
Appropriation for biennial period	$40,000.00
Federal allotment	13,215.86
Total available	$53,215.86
Expended during biennial	53,215.86
Total appropriation of all departments for biennial 1920-22	111,495.89
Federal aid	13,215.86
Total fees available July 1, 1920	6,279.66
Total fees paid Treasurer during biennial	61,966.50
Total funds available for biennial 1920-22	$192,957.91

Total expense of all departments for biennial		156,074.61
Total unused appropriation to general revenue	$11,684.14	
Total amount fees returned to general revenue	16,475.03	
Total amount fees carried over	8,724.13	
	$36,883.30	$36,883.30

BOARD OF MEDICAL EXAMINERS

Total number of physicians registered and practicing in this state June 30, 1922	3,800
Number of certificates issued upon examination	93
Number of certificates issued by reciprocity from other states	95
Total number of certificates issued during biennial period	188
Number of itinerants' licenses issued during biennial period	7
Number of Osteopathic Certificates issued July 1, 1920 to July 18, 1921, when law was changed creating separate board	22
Total number of osteopaths registered in Iowa at the end of the biennial period. (By the board of medical examiners)	761

OPTOMETRY DEPARTMENT

At the beginning of the biennial period, July 1, 1920, there were 437 Optometrists in good standing in Iowa.

At this time there were 811 optometrists registered in Iowa, but of this number only 437 had paid their annual renewal fees and remained in good standing, the others having discontinued business or allowed their licenses to lapse.

Total number of certificates issued upon examination during biennial period	33
Total number of certificates issued upon reciprocity during biennial period	35
Total number of Optometry certificates issued during biennial	68
Total number of Optometrists in good standing June 30, 1922	494

EMBALMERS DEPARTMENT

At the end of the biennial period, June 30, 1922, there were 1,419 licensed embalmers in good standing with the Iowa State Board of Health.

During the biennial period, July 1, 1920, to June 30, 1922, there were 134 embalmers' licenses issued upon examination and 12 by reciprocity, making a total of 146.

During the biennial period there were 1,755 disinterment permits issued.

NURSES DEPARTMENT

Total number of nurses registered by examination during biennial period	884
Total number of nurses registered by reciprocity during biennial period	45
Total	929

PODIATRY DEPARTMENT

Total number of podiatrists' licenses issued by exemption	57
Total number of podiatrists' licenses upon examination	2
Total	59

STATE EXAMINATIONS HELD

(During biennial period)

Number of examinations held for physicians and osteopaths	7
Number of examinations held for embalmers	4
Number of examinations held for nurses	8
Number of examinations held for optometrists	4
Number of examinations held for podiatrists	1

ANTITOXIN DEPARTMENT

Many states have an appropriation whereby antitoxins and vaccines may be distributed free to those who need same, but in Iowa we contract with a reliable manufacturer for a five-year supply to be delivered as needed to our communities at state contract prices. This method has enabled the people of Iowa to obtain antitoxins and vaccines at the lowest possible price. All goods distributed in Iowa under this contract are exchangeable for fresh goods if same become outdated while in the state.

During this biennial period, July 1, 1920, to June 30, 1922, we distributed from this office diphtheria antitoxins as follows:

13,626	packages	1,000 units
2,245	"	3,000 "
6,371	"	5,000 "
4,996	"	10,000 "
105	"	20,000 "

Tetanus antitoxin:

4,317	packages	1,500 units
633	"	3,000 "
1,157	"	5,000 "
132	"	10,000 "

Typhoid vaccine:

10,041 vaccinations

Smallpox vaccine:

81,473 vaccinations

Pasteur treatments for dog bits—rabies:

120 treatments for prevention of rabies.

The above figures represent only the goods furnished from our emergency stock 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.

BUREAU OF VENEREAL DISEASE CONTROL

Wilbur S. Conkling, M. D., Director

The total funds available for the biennial period ending June 30, 1922, was $53,215.86; $40,000.00 being the state appropriation and $13,215.86 being the federal allotment.

The expenditures were as follows:

Administration	$11,150.82
Laboratory	18,052.30
Treatment	10,152.37
Education	13,860.37
Total	$53,215.86

Fourteen clinics for treatment of the indigent were maintained in the following cities: Des Moines, Dubuque, Clinton, Fort Dodge, Mason City, Grinnell, Sioux City (2), Ottumwa, Council Bluffs, Marshalltown, Davenport, Manly, Iowa City; these were supported by the local counties or cities, with the exception of the clinic at Iowa City which is supported by the state; the medication was furnished by this bureau.

New cases were admitted and treated, classified as follows:

	Syphilis	Gonorrhea	Chancroid
Male	866	951	98
Female	570	400	4
	1,436	1,351	102

The total number of consultations and treatments was 59,027. The total number of doses of arshphenamine or neo-arsphenamine administered was 15,841.

In addition to the work of the clinics, private or city physicians administered free of charge 2,368 doses of arsphenamine or neo-arsphenamine and 760 doses of mercury to indigent patients suffering with venereal diseases, the medication being furnished by this bureau.

Through the activities of this bureau, a large number of cases were sent to the state university hospital and were treated by Dr. N. G. Alcock.

There were 43,553 Wassermann tests made of which 7,114 were positive, the balance being negative or rejected. There were 3,363 gonorrheal tests made of which 693 were positive.

Physicians from all of the ninety-nine counties of the state availed themselves of the use of the veneral disease laboratory during the year, the number of examinations from each county being as follows:

Adair	111	Floyd	76	Monona	75
Adams	7	Franklin	37	Monroe	155
Allamakee	75	Fremont	79	Montgomery	30
Appanoose	274	Green	10	Muscatine	444
Audubon	11	Grundy	13	O'Brien	137
Benton	96	Guthrie	1	Osceola	5
Black Hawk	1,304	Hamilton	51	Page	429
Boone	206	Hancock	62	Palo Alto	35
Bremer	115	Hardin	120	Plymouth	85
Buchanan	691	Harrison	33	Pocahontas	429
Buena Vista	140	Henry	98	Polk	12,009
Butler	121	Howard	5	Pottawattamie	500
Calhoun	322	Humboldt	2	Poweshiek	171
Carroll	292	Ida	79	Ringgold	1
Cass	98	Iowa	95	Sac	16
Cedar	37	Jackson	72	Scott	2,173
Cerro Gordo	398	Jasper	472	Shelby	77
Cherokee	608	Jefferson	95	Sioux	45
Chickasaw	20	Johnson	9,532	Story	238
Clark	65	Jones	155	Tama	28
Clay	74	Keokuk	43	Taylor	7
Clayton	11	Kossuth	42	Union	77
Clinton	693	Lee	1,965	Van Buren	1
Crawford	145	Linn	2,503	Wapello	229
Dallas	35	Louisa	31	Warren	2
Davis	3	Lucas	25	Washington	76
Decatur	44	Lyon	48	Wayne	14
Delaware	28	Madison	2	Webster	677
Des Moines	283	Mahaska	57	Winnebago	19
Dickinson	52	Marion	31	Winneshiek	26
Dubuque	635	Marshall	278	Woodbury	1,942
Emmet	43	Mills	27	Worth	41
Fayette	338	Mitchell	5	Wright	186

Owing to the excellent assistance given by the attorney general's office and the various local authorities, the director has not seen fit to employ agents for carrying on the work of repressive measures. The bureau has always found the attorney general and his corps of state agents ready at all times to give their help whenever called upon, and it has therefore been unnecessary for the bureau to duplicate the work of the state agents. Local boards of health and the civil authorities have in practically every instance responded whenever their attention was called to infringements upon the law. The social welfare organizations have also been very active and willing at all times to do whatsoever they could in carrying on the work.

The physicians of the state reported to the secretary of the state board of health 2,069 cases of syphilis, 4,395 cases of gonorrhea and 185 cases of chancroid.

Dr. Jeannette F. Throckmorton gave 1,083 lectures reaching 185,205 women and girls in 255 towns of the state.

The total number of pamphlets distributed was 78,771, in response to requests from individuals, schools, lecturers, field workers, state and county fairs.

The venereal disease slides and charts were shown 113 days at the state and county fairs. The total number viewing these exhibits was 272,385. There were 113 film showings made with a total attendance of 41,385.

The director visited in an official capacity twenty-two cities and towns, addressing five county medical societies, three conventions and three conferences on social work.

There were 199 individuals reported to this office as sources of infection by the physicians of the state of which ninety-seven were apprehended and placed under treatment. There were seventy-five cases referred to this department from other states and thirty-five were apprehended and placed under treatment.

Beside the regular correspondence, personal letters were sent as follows:

To all of the physicians of the state who were not reporting cases
To the Mayors
Druggists
Superintendents of the high schools in the county seats
Ninety-nine County Attorneys
Sixty-four Judges of the District Courts
Seven hundred thirty-nine Mayors of cities and towns (two letters)
Seven hundred thirty-nine City Health Officers (two letters)
Two hundred Social Workers
Two hundred fifty Public Health Nurses
Ninety-nine County Health Officers
One thousand Rural School Teachers

At the request of this bureau, the interdepartment social hygiene board sent federal agents who made a thorough survey of social conditions in forty-five of the larger cities in Iowa. A copy of this report was sent from this office with a letter to the mayors and city physicians of the city in which the survey was made. The attorney general was furnished a copy of these reports which he sent with a personal letter to each of the county attorneys. It is believed that much good has resulted from these investigations as the tone of the letters from the mayors, acknowledging receipt of the report, was most excellent.

HOUSING

Edwin H. Sands, Commissioner.

The statute regulating housing in the cities of 15,000 or more became effective July 4, 1919. This statute is known as Chapter 123, Senate File No. 475, thirty-eighth general assembly. This report closes the third year of the activities of the housing department of the state board of health.

From the beginning, the department has realized the value and necessity for a general educational program along the lines of housing. The purposes for which the law was enacted and the law itself was quite generally misunderstood. The department asked for, and received, the hearty cooperation of the local city councils, commercial clubs, women's federated clubs and other civic groups. In nearly every instance, preconceived prejudices were disolved and, instead of opposition, favor obtained. The only consistent opposition to the law is found among that group which owns or controls, for rental purposes, cheap tenements or other low class property.

The years 1919-20-21 were subnormal in building activities. New development fell far short of the natural increasing demands. The forming of new family units, through marriage and otherwise, far exceeded the housing development with a resultant serious shortage of homes and an exceedingly high rental. This resulted in the overcrowding of available housing, oftimes three and four families living in what otherwise would be a one family house. This especially was true among the poorer classes living in the poorer class housing, where it was difficult to obtain anything like privacy or even the semblance of sanitation. Many a house that would have been condemned as unfit for dwelling purposes, was permitted to be occupied because of the prevailing shortage. The department estimated that Iowa was short approximately 50,000 home units at the end of 1920.

In the late spring and summer of 1921, considerable activity in new construction was noted in a few of the larger cities. This activity was renewed and largely increased in proportions in 1922 and became quite general throughout the state, promising to be the biggest year in building activities witnessed in many years. Permits for new dwellings now average 350 each month with an average approximate value of $1,650,000.00 each month. About 15 per cent of all plans submitted for new development or remodeling require more or less change before approved by the local inspector and about 1 per cent comes to the state department for interpretation or final decision.

The fire protection provisions of the law have given the department the most trouble. Especially was this true during the congested period

when many attic rooms were more or less temporarily occupied. Effort was directed at the reduction of the extreme hazards and, where permanent occupancy seemed likely, as is frequently the case in and about the colleges and large schools, permanent fire escapes were placed on the buildings.

The provisions of the law to compel sewer connections to be made when same is reasonably possible, has been emphasized and much good work accomplished along this line. Sioux City made a particularly good record in securing between 5,000 and 6,000 sewer connections for residential property during the year 1921.

Des Moines, Sioux City, Davenport, in the order named, have led in residential building activities in the state, and in each of these cities, the housing law has been efficiently enforced by the local authorities. The state department condemned the city jail in Sioux City and a new jail is now in process of building.

The law, as enacted, has proved to be a very reasonable and practical statute. There are, we believe, a few changes which should be made, however. We believe that the principle involved in the housing statute should be made to cover housing conditions throughout the state, whether on the farm, in the village, small town or large city. Bad housing, including insanitary and other unhealthful conditions, is as detrimental to the family on the farm, as the one in the city. This department has investigated several complaints from farm and village, and has found cases of living conditions as bad as, and sometimes worse than, any conditions found in any of our cities. If anything, we would say that these cases are, many times, of more far reaching consequence in that there is no agency whatever, to give advice or attention to the unfortunate, as we have in the city.

In this connection, we believe that the statute, as now drawn and which is mandatory in the cities of fifteen thousand should be made mandatory in cities of five thousand and more in population. These cities are rapidly growing, and many of the bad conditions in housing development may be eliminated, and many serious problems of the larger cities made impossible. Cities of five thousand or more, are large enough to have the necessary permanent help on the city staff, to properly enforce the regulations. Special value is attached to the housing conditions in our college towns, the most of which are between five thousand, and fifteen thousand population. Here students are crowded into attic rooms or other rooms, often times with inadequate ventilation, toilet facilities, and fire protection.

Another thing along these lines which has frequently been called to our attention and which at the present time is extremely difficult to remedy, is the conditions found in and about so-called section houses, along the railroad right-of-ways, where, in most cases, Mexican, or other foreign labor, are housed in derailed cars, generally with little or no ventilation, and no, or very inadequate, toilet facilities, while often times the general sanitation about these places is very bad. There should be a regulation of the conditions in and about the box cars used for sleeping and eating purposes by the railroad construction and working crews.

We would also call attention to the construction camps maintained by road grading and surfacing crews. A large number of these crews are at work throughout the state. These usually establish a camp just off the road, and frequently these camps are not only dangerous to the health of the workman, but of the vicinity, due to the lack of ordinary sanitary precautions.

The recent development of so-called tourist camps along the main highways of our state, presents another problem that should be given attention from the health standpoint. The water supply of the camp, as well as the general sanitation, is such, in many cases, as to invite a wide spread epidemic.

All of the matter above referred to could be handled under a provision which would extend the principle of the housing law, making it effective throughout the state, wherever conditions become a menace to the health of the people of the community, or state.

MINING CAMPS

The work, under Section 106 of the Housing Law, has proceeded with good results considering the limitations and the indefinite wording of the statute when applied to camps erected previous to the enactment of the law. Two new camps have been erected during the biennial period, and these camps, in every way, prove the value of the state supervision.

In the first place, there remains a considerable question as to what constitutes a mining camp. There are many towns in the state where housing conditions are practically the same as in the distinctive camps, but which have developed along other lines, and perhaps have incorporated and are, according to the present statute, not included under the head of mining camps. We would recommend that any town, where 50 per cent or more of its male population work in or about a mine, should be designated a mining camp.

Another thing that we would recommend in this regard, is that authority be given the housing department of the state board of health, to take such action as may be necessary to remedy bad housing conditions that exist in most of the old camps, before they become an actual menace to the health of the inhabitants. The present statute reads "whenever the health conditions in any mining camp in the state are, or become, a menace to the health of the inhabitant, the state board of health is authorized to apply and enforce the provisions of the housing act." This seems to make it necessary to wait until something develops. We would lock the stable before the horse is stolen. We would eliminate those bad conditions which are known to be productive of sickness and disease, before the same has had a chance to develop.

PLUMBING

In April, 1922, the state board of health placed the enforcement of the state plumbing code with the housing department. We found that there were no provisions made for the enforcement of same and it is our belief that the present plumbing code is so inadequate in every way as to make

it valueless. We do believe, however, that there should be an effective plumbing code in the state, and recommend that legislative authority be given for a complete revision of the present code.

ACTIVITIES

During the biennial period, the state has not been called on to directly prosecute any case in court. We have frequently been called upon, however, to assist the local authorities in prosecuting cases in their local courts. A large number of appeal cases, where appeals have been taken from decision of the local inspector, have been handled by the department, and we have given personal assistance to the local inspector on some of his inspection work, required under the law. We have also been called on to frequently consult with local boards of health in smaller towns, in an effort to eliminate some serious local conditions. During the biennial period, we have visited the following cities and towns. July-December, 1920: Albia, Algona, Belmond, Belle Plaine, Centerville, Clinton, Clarinda, Council Bluffs, Davenport, Ft. Dodge, Forest City, Glenwood, Grinnell, Ida Grove, Knoxville, Mason City, Marshalltown, Osage, Ottumwa, Oskaloosa, Sigourney, Waterloo, Webster City. Mining Camps: Consol, Hamilton, Lovilia, Mystic, Moravia.

1921—Ames, Albia, Boone, Council Bluffs, Clinton, Cedar Rapids, Davenport, Dubuque, Ft. Dodge, High Bridge, Jefferson, Mason City, Marshalltown, Ottumwa, Shenandoah, Sioux City, Storm Lake. Mining Camps: High Bridge (Madrid), Lovilia, Madrid, Moran, No. 19 Mining Camp, Waukee.

Cities and towns visited from January to June, 1922: Ames, Ankeny, Bloomfield, Cedar Rapids, Clarinda, Creston, Davenport, Grinnell, Iowa City, Mason City, Sioux City.

HOTEL AND RESTAURANT INSPECTION

Dr. George T. Barcklow, State Hotel Inspector.

HOTELS

The hotel inspection department of the state board of health was authorized by the thirty-third general assembly of Iowa. The thirty-ninth general assembly enacted the restaurant law and made it the duty of the hotel inspector to see that the provisions of said law were enforced. The restaurant law became effective May 11, 1921, and appliable to all eating places in the state and covered the sanitary requirements necessary to conduct such place.

At the regular annual meeting in July, 1921, the board elected Dr. G. T. Barcklow to hold the office of state hotel inspector for a period of two years, relieving Mr. J. B. Heefner from this position. Dr. Barcklow took charge August 1, 1921.

The hotel inspection department is charged with the enforcement of the regulations of rooming houses and hotels and providing for license, also the law governing licensing and inspecting eating places.

Hotel inspection was enacted by the thirty-third general assembly originally but has been added to by most every general assembly since the third-third amending and re-enacting as the case may be for the betterment of the traveling public and incidently for the betterment of the proprietor of the hotels.

As a legacy from the past there are numerous poorly repaired buildings dignified by the title "Hotel," many of these houses were never originally intended for hotels but have been converted from dwellings to hotels by the addition each year of various improvements such as installing running hot and cold water in such rooms as it was possible, installing modern plumbing, turning from the old hot stove to steam heat in each room until at last most everything is modern but the building.

The more enterprising hotel men are erecting modern buildings up to date which comply with the law as far as the buildings is concerned. Class "A" and "B" fire escapes, fire ropes, notices posted in halls and rooms, rate sheets, bed linen, towels, cleanliness, freedom from vermin, repair of the building, ventilation of rooms, fire hazards, freedom from disease of the employed, condition of the kitchen, dining room and basement now is our job.

The inspection is made by a deputy hotel inspector and notations made of the above enumerated conditions and the proprietor is instructed at that time to correct each thing that may be found unlawful.

The method adapted for the enforcement of the hotel law by the issuing of delinquency notices by the deputy inspector as coming from the hotel inspection department has after four years' trial proved to be most satisfactory. The system places the responsibility for action upon the

state hotel inspector and so removes from the deputy inspector the burden of personally giving orders which he cannot remain to see carried out. The official notice is without exception received as a legal order which must be obeyed. The opportunity given for appeal is very rarely made use of and in most instances the improvements ordered are made before the time limit set has expired, this notice is served on both the restaurants and hotels.

On the completion of the work necessary to make the establishment comply with the law the reverse side of the delinquency notice is used for affidavit as to the compliance and returned to the office of state hotel inspector, from now on this order is held as a battle-ax over the head of the proprietor for upon a second offense a prosecution in a justice or municipal court will follow as you may note from the report of prosecutions.

In enforcing the laws we have found various loop holes that a violator could make good use of. The proposed legislation for this department has been built up from sad but wise experience of those of us who are compelling its enforcement.

I desire to attract your attention for a moment as to a few changes or amendments to the hotel law we propose to submit to the fortieth general assembly:

1. The statutes do not require a hotel keeper to have a register into which his guests sign their name and be known in case of fire. We propose such a register.

2. The statutes do not require that a room infested with bed bugs or vermin be closed to the public until such time as it is free from these night terrors. We propose to close that room until such time as it is entirely free from these invading forces.

3. The statutes exact $15.00 from a hotel containing 150 or more rooms and it costs almost double that sum to inspect a hotel that size more than once a year. We propose to equalize this license fee, let the large hotel pay in proportion to the time taken to make the inspection.

4. The statutes do not require a fire extinguisher in a hotel unless each floor contains 2,500 feet of floor space. We propose to put at least one extinguisher in each hotel regardless of its floor area.

5. The statutes makes no provision for the privacy of a guest in a hotel, in other words, if two strangers occupy one room the price may be double that of one guest yet the privacy of both guests is disturbed. We propose to equalize this condition.

6. The statutes make it mandatory that three or more patrons of a hotel must sign a complaint and that complaint only covers unsanitary conditions and fire escapes not in accordance with the law, before an inspector can inspect the hotel and have his expenses paid by the proprietor of the hotel, if the conditions complained of are bonafide. We propose to have a reinspection on the complaint of one guest and that complaint may cover not only sanitation and fire escapes but all parts of the act.

7. The statutes make it necessary for an inspector to issue a delinquency notice on all things found unlawful. We propose a substitute whereby a chronic violator may be prosecuted without the formality of a notice again being necessary.

These proposals contain in the main those changes, substitutions or amendments which I consider important both to the traveling public and protection to all law abiding hotel operators.

Following are the prosecution of hotels and the reason for same with disposition of the case.

1. October, 1921. Herring Cottage, Belle Plaine, Iowa. L. Prazak, defendant. C. W. Burnham, justice of peace. Sect. 2514-j, failure to post notice stating way to fire escape, maintaining toilet rooms in insanitary condition. Plea—Guilty. Fined $10.00 and costs. Prosecuted by Deputy Mr. Day.

2. October 5, 1921. Iowa Hotel, Belle Plaine, Iowa. Paul Mohr, defendant. C. W. Burnham, justice of peace. Section 2514-j, failure to post notice stating way to fire escapes. Plea—Guilty. Fined $10.00 and costs. Prosecuted by Deputy Mr. Day.

3. October 8, 1921. H. D. Campbell, defendant. Orleans Hotel, Estherville, Iowa. Section 2514h-1, failure to procure a license and file application with hotel inspector. Plea—Guilty. Fined $20.00 and costs. Prosecuted by Deputy Mr. Grimes.

4. October 8, 1921. Crawford Hotel, Estherville, Iowa. James Crawford, defendant. O. N. Refsell, justice of peace. Failure to procure a license and file application with hotel inspector. Plea—Guilty. Fined $60.00 and costs, a civil suit to follow by local authorities. Prosecuted by J. W. Grimes, Deputy.

5. October 17, 1921. Zalesky Hotel, Cedar Rapids, Iowa. John Dvorak, defendant. F. Lightner, justice of peace. Section 2514j, failure to provide fire escape rope. Section 2514m-7, failure to post rate notice. Plea—Guilty. Fined $10.00 and costs. Prosecuted by Deputy Mr. Day.

6. October 21, 1921. Gillen Hotel, Anamosa, Iowa. H. W. Carlton, defendant. J. McMunn, justice of peace. Section 2514m-7, failure to post notices regarding fire escapes and fire ropes. Section 2514-j, failure to post rate notices. Plea—Guilty (first plea, not guilty). Fined $10.00 and costs. Prosecuted by Mr. Day, Deputy.

7. January 26, 1922. Metropole Hotel, Waterloo, Iowa. Henry Sebus, defendant. Judge Gwynne (Municipal Court). Section 2514m-3, failure to provide clean sheets and pillow slips on transient guest beds. Plea—Guilty. Fined $25.00 and costs, $5.10; total $30.10. Prosecuted by Mr. Buckley, Deputy.

8. December 31, 1922. Zahiridis Rooms, Mason City, Iowa. Sam Zahiridis, defendant. D. D. Fuller, justice of peace. Failure to change bed linen, bed bugs in the beds, hotel in insanitary condition. Plea—Guilty. Fined $50.00 and costs, $5.06; total $55.06. License revoked, rooms ordered closed by State Hotel Inspector. Prosecuted by C. J. Buckley, Deputy.

9. Hotel Burkley Imperial, Iowa City, Iowa. A. Burkley, defendant. Mr. Crossett, justice of peace. Section 2514m-3, sheet used as top sheets 81 inches long instead of 96 inches. Plea—Guilty. Fined $10.00 and costs. Prosecuted by Mr. Day, Deputy.

10. March 21, 1922. Luke Hotel, Knoxville, Iowa. C. E. Luke, defendant. I. H. Garretson, justice of peace. Failure to post rate notice, to change bed linen on transient guest beds. Hotel insanitary. Plea—Guilty. Fined $10.00 and costs, total $12.50. Prosecuted by Mr. Day, Deputy.

11. March 29, 1922. Magnus Hotel, Cedar Rapids, Iowa. G. S. Lightner, justice of peace. Overcharging a guest $3.00. Plea—Not guilty. Found guilty by evidence submitted at trial. Fined $25.00 and costs; $3.00 was also collected and returned to C. W. Dippert of Des Moines, who was the guest overcharged. Prosecuted by Mr. Buckley, Deputy.

12. April 25, 1922. Hotel Jefferson, Iowa City, Iowa. W. O. Gosselin, defendant. E. A. Crossett, justice of peace. Wilfully neglected to make route to fire escape safe and sufficient, had carpet and boxes in halls leading to escape. Plea—Guilty. Fined $20.00 and costs. Prosecuted by Dr. G. T. Barcklow, Hotel Inspector.

13. April 25, 1922. Hotel Jefferson, Iowa City, Iowa. W. O. Gosselin, defendant. E. A. Crossett, justice of peace. Wilfully refusing and neglecting to post rate notice in rooms on seventh floor. Plea—Guilty. Fined $20.00 and costs. Prosecuted by Dr. G. T .Barcklow, Hotel Inspector.

14. August 29, 1922. A. A. Stewart, defendant, Centerville, Iowa. D. W. Bryan, justice of peace. Failure to wash sheets after one transient guest, failed to change linen. Plea—Not guilty, two postponements, change of plea to guilty September 15. Fined $5.00 and costs. Prosecuted by Mr. Day, Deputy.

15. November 22, 1922. Hotel, Julien-Dubuque at Dubuque, Iowa. Daniel Mackin, defendant. Jess W. Green, justice of peace. Overcharging a guest a rate of $50.00 for Room No. 207 on the night of August 14, 1922. Plea. This information written by County Attorney McCabe first made Julien Hotel Co., A. A. Cooper, President, the defendant. A demurrer was filed by Mr. Cooper's attorney and sustained by the court. New information made Julien-Dubuque Hotel defendant. Demurrer affixed and sustained by court. We withdrew and then made Mr. Daniel Mackin, the manager, defendant. Plea of not guilty entered. Final disposition of case dismissed not guilty by judge.

Remarks—The Julien-Dubuque Hotel then swore out a warrant for Geo. W. King, the state's witness, and sued him for $35.00, balance due. The same justice dismissed this case without prejudice.

From the foregoing cases you may see how much out of proportion is the fine to the crime. We propose legislation whereby it will be unprofitable to the proprietor of a hotel to violate these laws of Iowa.

Hotels licensed in 1922	2,130
Hotels transferred in 1922	170
Hotels licensed in 1921	2,073
Hotels transferred in 1921	91

RESTAURANTS

The thirty-ninth general assembly passed the laws relating to inspection and licensing of all places serving food to the public for pay.

The act provides that the hotel inspection department make these inspections and provide for no additional compensation other than that provided for in the hotel law. The act is very broad in its scope, leaving much to the judgment of those charged with the enforcing of it.

That such a law was sadly needed no one of sound judgment will question for a moment for the hand pollution of food is fully recognized as one of the greatest sources of disease as an intermediate carrier.

When one considers that the human hand can reach every orifice of the human body and because contaminated with discharges therefrom, it is easily seen how food to be eaten by others can be polluted by unclean hands of people who are temperamentally dirty.

To combat this condition is one of our endeavors which we are trying to accomplish by frequent washing of the hands and forbidding smoking in the kitchen and dining room by the help.

When first we were assigned the enforcing of these acts, the low state of the restaurants from a sanitary viewpoint can hardly be imagined, fully 80 per cent of them were unclean and some even filthy.

It was evident that first they must be made clean. We went about inspecting them and lecturing to the managers and cooks and chefs as to what was required of them.

On a fair whole they met us well, cleaning up, buying new equipment, ice boxes, refrigerators, dishwashers, meat blocks, crockery, kitchen utensils and silverware. After our first time around they found us not so lenient for those who had failed to heed our instructions were haled into court and contributed their bit for their failure.

The department prepared a set of rules for the proprietor and his help to govern themselves by. We have prepared a formula for them to rid their establishment of roaches, rats and mice and insist that it be used when roaches are in evidence. It is frequently necessary to deliver a lecture in the restaurant to the help explaining why things should be so.

We find our chief trouble is with the foreign element, their conception of sanitation is so far removed from the American ideal that not only do we have to tell them the law, but the reason for the law, in other words, we are compelled to give them a short talk on sanitation.

I have observed that where a fine is imposed by the court on one member of this element they are clannish enough to hear of it and proceed in that city or town to clean up and remain that way for a much longer time than had not this fine been exacted by the court.

The inspection of restaurants and eating stands on the fair grounds is a task that would try the patience of Job.

During the fair season of 1922 our inspectors inspected and reinspected at the following fair grounds: Indianola, Corning, Sioux City, Red Oak, Greenfield, Davenport, West Point, Donnelson, Fairfield, Mt. Pleasant, Monticello, West Liberty, Burlington, Tipton, De Witt, Maquoketa, Carroll, Arnolds Park, Sac City, Alta, Sheldon, Rock Rapids, Orange City, Arion, Ida Grove, Onawa, Spencer, Marshalltown, Sigourney, Marion, Tama, Albia, Centerville, Eldon, Corydon, Drakeville, Exline, Bloomfield, Ottumwa, What Cheer, Central City, Vinton, Oskaloosa, Moravia, Newton, Toledo, Pulaski, Des Moines, Rockwell City, Mason City, Clear Lake, Britt,

Manson, Webster City, Algona, Humboldt, Toledo, Knoxville, West Union, Ames, Elkader, Allison, Perry, Jefferson, Guthrie Center, Atlantic, Bedford, Malvern, Shenandoah, Harlan, Avoca, Clarinda, Hamburg, Audubon, Red Oak, Missouri Valley, Dubuque, Dyersville, Decorah, Waukon, Waverly, Cedar Rapids, Waterloo, Nashua, Osage, Aurora, National, Hazelton, Manchester, New Hartford, Grundy Center, Strawberry Point, Independence. A total of 1,357 places serving food were found on the grounds at the above enumerated places. They were instructed as to sanitary conditions that must be observed yet we confiscated and destroyed about 200 pounds of weiners and hamburger, four chickens, and we can only estimate the amount of breadstuffs and pies ordered destroyed in the inspector's presence.

SUMMARY

Since taking over the guiding spirit of the hotel department, I have trained seven inspectors in this class of work in conjunction with hotel inspection. These men receive instructions almost daily by mail. Every eight weeks a meeting of deputies is held and they have an opportunity to bare their troubles, and the method of disposing of cases of similar nature is then worked out and it becomes law. The relation between the department head and the deputy inspectors is most congenial. We are all pulling in the same direction and that direction is upward.

It has been a source of great pleasure to the writer to see such vast improvements in such a short space of time and yet we are not satisfied with conditions for it is an educational program that we are putting on and it will require time to have the hyphenated American element whipped into that line that must be followed in the near future.

The department has taken a number of cases of veneral diseases, tuberculosis and skin diseases and other contagious diseases out of restaurants and forbid their working in such places until a clean bill of health was given, the venereal cases being reported to the proper authorities as were the others.

Permit me to state that even in a law so recent (passed in 1921 by the thirty-ninth general assembly) there are some omissions that we will endeavor to correct in the fortieth general assembly that our law may be operative to the best interest of the good restaurant operator and detrimental to him that fears no law and still tries to serve food to the public that he himself will not eat.

Below are reports of some court actions taken since the law was effective:

1. November 14, 1921; C. F. Dunkel restaurant, Iowa City Iowa; C. F. Dunkel, defendant; E. A. Crossett, justice of peace; willfully refused to make application for restaurant license to conduct a restaurant; found guilty; fined $1.00; prosecuted by Jas. S. Day, deputy.

2. Galias restaurant, Mason City, Iowa; Gus Galias, defendant; D. D. Fuller, justice of peace; maintaining his establishment in insanitary condition; plea, guilty; fined $50.00 and cost $3.00, total $53.00; prosecuted by C. J. Buckley, chief deputy.

3. February 6, 1922; Pappas restaurant, Iowa City, Iowa; Geo. Pappas, defendant; A. E. Crossett, justice of peace; maintaining his restaurant in insanitary condition, permitting a roller towel and cracked dishes in establishment; plea, guilty; fined $3.00 and costs $2.00, total $5.00; prosecuted by Jas. S. Day, deputy.

4. February 9, 1922; Harry's place, Des Moines, Iowa; Harry Cogshell, defendant; Judge Mershon (Municipal); failure to lay a new floor, old one very insanitary; plea, not guilty; fined $50.00, held in abeyance, costs charged; prosecuted by Dr. G. T. Barcklow, hotel inspector.

5. April 3, 1922; Manos restaurant, Shenandoah, Iowa; William Manos, defendant; J. O. Chenay, justice of peace; restaurant in insanitary condition, permitting the use of roller towel in restaurant; plea, guilty; fined $10.00 and costs, total $13.95; prosecuted by Jas. S. Day, deputy.

6. April 26, 1922; Stringfellow restaurant, Oskaloosa, Iowa; R. H. Stringfellow, defendant; L. M. Beacon, justice of peace; in that he permitted the use and presence of chipped and cracked dishes in his restaurant; plea, guilty; fined $10.00 and costs, total $12.85; prosecuted by Jas. S. Day, deputy.

7. April 26, 1922; Bishop cafe, Oskaloosa, Iowa; J. E. Bishop, defendant; L. M. Beacon, justice of peace; wilfully permitting the use of chipped and cracked dishes in his restaurant; plea, guilty; fined $10.00 and costs, total $12.85; prosecuted by Jas. S. Day, deputy.

8. June 22, 1922; Burkes restaurant, Ottumwa, Iowa; John Burkes, defendant; J. H. Cremer, justice of peace; operating restaurant in an insanitary condition; plea, guilty; fined $5.00 and costs, total $8.85; prosecuted by Jas. S. Day, deputy.

I could go with ever so many more such as above, but I desire to bring out that a plea of guilty was entered by the defendant in each case and the court fined the defendant from $3.00 to $5.00 average. With the amount of energy expended by the department in bringing to justice those who literally have lives at stake it does not seem to the writer that the fines imposed by the justice of the peace under whose jurisdiction these misdemeanors are bound to come, are sufficient for the crime committed.

This is the reason we are asking for more legislation on these cases so a minimum fine may be set by law for violation of this class and the court be obliged to impose it upon the guilty party.

I desire to draw to your attention that the department has no appropriation, working only on the original license fee collected from each individual or company in either the hotel or restaurant business.

It has been a source of pleasure to me to see the complaints received from the public cut down to the point that we now receive about three each month.

Restaurants licensed in 1921	2,707
Restaurants licensed in 1922	3,863
Total inspection of hotels and restaurants for eleven months in 1922	11,561

VITAL STATISTICS

Since January, 1922, the department of vital statistics has furnished upon special request the following reports:

Number of deaths of children under one year of age in Linn county in the past six months. To Harnell Hart, head of sociology department, State University.

Number of divorces reported in the state from 1910 to 1922. Columbia University, to be used in research work.

Number of deaths and their causes in the city of Des Moines for the year 1921. Dr. Sayler, Des Moines, Iowa.

Number of cases and deaths reported from typhoid in the city of Des Moines for the year 1921. Water Company, Des Moines, Iowa.

Number of deaths caused by pneumonia, diphtheria and tuberculosis monthly for the year 1921. Miss Smith, Drake University student.

Number of deaths caused by accident and violence in the year 1921. Associated Press.

Number of cases and deaths reported from anterior poliomyelitis from June 30, 1911 to Dec. 30, 1921. Dr. C. C. Field, Fort Dodge, Iowa.

Number of deaths from alcoholism for the years 1917 and 1921. Union Signal, Evanston, Ill.

Report of deaths from tuberculosis in Woodbury county. Miss Isabelle Kellman.

Report of deaths from tuberculosis in Keokuk county. Miss Isabelle Kellman.

Number of deaths from all causes, tuberculosis (pulmonary), tuberculosis (all forms), influenza, pneumonia (all forms), for the years 1910 to 1921 inclusive. To Dr. W. McNab Miller, Missouri T. B. Assn., St. Louis, Mo.

Number of deaths from puerperal sepsis for the years 1920 and 1921. To Dr. R. A. Hills, Russell, Iowa.

Report on infectious jaundice. To Dr. Geo. Blumer, New Haven, Conn.

Number of deaths reported in the city of Davenport, Iowa, during the year 1921. To Hill & Fredericks, Morticians, Davenport, Iowa.

Number of deaths from diabetes, nephritis and Bright's disease in the state of Iowa in the years 1920 and 1921. To Mr. Bind, Manager, Calrence Company, San Francisco, Cal.

Number of births and infant mortality for Mason City, Iowa, for the years 1920 and 1921. To Globe-Gazette, Mason City, Iowa.

Number of births attended by midwives in the years 1920 and 1921. Dr. Julius Levy, Trenton, N. J.

Number of living births and number of stillbirths reported in the State of Iowa in the year 1921. Dr. Florence D. Johnston, Cedar Rapids, Iowa.

Number of cases of infantile paralysis reported during the years 1912 to 1920 inclusive. Edith M. Smith, Davenport, Iowa.

Infant mortality rate for Cerro Gordo county for the years 1920 and 1921. Mrs. Vesta Martin, Globe-Gazette, Mason City, Iowa.

Number of births in Worth county for the year 1921. Number of deaths under one year. Number of stillbirths. To Jane M. Wiley, Public Health Nurse, Northwood, Iowa.

Number of deaths from cancer and diabetes in the city of Des Moines for the years 1912 to 1919 inclusive. F. L. Hoffman, Newark, N. J.

Infant mortality rate per thousand live births of the Iowa cities between 15,000 and 25,000 namely: Clinton, Burlington, Ottumwa, Mason City, Fort Dodge, Muscatine, Marshalltown. Dr. T. J. Edmonds, Des Moines, Iowa.

Infant mortality rate for the cities of Burlington, Clinton, Fort Dodge, Keokuk, Marshalltown, Mason City, Muscatine, Ottumwa for the years from 1917 to 1921 inclusive. Mr. Courtenay Dinwiddie, child health committee, Washington, D. C.

Number of deaths from Caesarean section for the period from January 1, 1921, to July 1, 1922. Dr. Herman N. Bundesen, commissioner of health, Chicago, Ill.

Number of births and deaths reported from Winneshiek county for the period from July, 1921, to July 1, 1922. Mr. A. S. Bailey, the Decorah Republican, Decorah, Iowa.

Number of births in Des Moines since 1920. Des Moines Daily Capital, Des Moines, Iowa.

Number of deaths reported in the state of Iowa from diphtheria, tuberculosis, pneumonia and typhoid fever during the period from July 1, 1921, to June 30, 1922. Mrs. R. R. Mayberry, Cedar Rapids, Iowa.

Number of deaths reported in the state of Iowa from diphtheria, tuberculosis and pneumonia during the period from July 1, 1921, to June 30, 1922. Mr. W. O. Halverson, Scarville, Iowa.

Number of deaths reported in the state of Iowa from pneumonia, tuberculosis and typhoid fever during the period from July 1, 1921, to June 30, 1922. Miss Elizabeth Merkel, Springview, Neb.

Number of deaths reported from alcoholism in the state of Iowa for the period from January 1, 1922, to October 1, 1922. Mrs. Winifred Hathaway, New York City.

Death rate per 1,000 in Iowa for the years 1917, 1918, 1919, 1920 and 1921 also the rate per 1,000 in the cities of Des Moines, Davenport, Cedar Rapids and Fort Dodge for the same years. Mr. Ira L. Bare, Chamber of Commerce, North Platte, Neb.

Number of deaths reported from Sioux City and Woodbury county from cancer for the years 1918, 1919, 1920 and 1921. Mr. W. D. Hayes, Sioux City, Iowa.

Infant death rate and total death rate for the state of Iowa for the year 1921. Mary Louise Savery, Atlantic, Iowa.

Number of deaths reported from consumption, pneumonia and diphtheria for the years 1920 and 1921. Miss Adeline Paulsrud, Randall, Iowa.

Number of deaths reported from cancer during the year 1921. Des Moines Daily Capital, Des Moines, Iowa.

Number of deaths reported from cancer in Cass county during the year 1921. Dr. Max Emmert, Omaha, Neb.

Number of deaths reported from automobile accidents and burns for the years 1918-1921 inclusive. Mr. S. Pinel, Ames, Iowa.

Number of deaths reported from tuberculosis, scarlet fever and diphtheria from Worth county during the years 1917-1921 inclusive. Dr. E. H. Dwelle, Northwood, Iowa.

Mortality rates for the state of Iowa and the cities of Cedar Rapids, Davenport, Des Moines, Fort Dodge and Iowa City. J. E. Burke, Kansas City, Mo.

Death rate per 100,000 population from smallpox in the registration area of the United States for the past five years. Dr. L. D. Smith, Woodward, Iowa.

Since January 1, 1922, the department of vital statistics has issued 699 certified copies of birth and death records. Out of this number 116 were for government compensation and 252 were for government pension claims.

DEATH RATES PER 100,000 POPULATION FOR TUBERCULOSIS, PNEUMONIA, (ALL FORMS), TYPHOID FEVER, DIPHTHERIA, SCARLET FEVER, WHOOPING COUGH AND MEASLES FOR THE STATE OF IOWA. (1910-1921.)

Year	Tuberculosis	Pneumonia (All forms)	Typhoid fever	Diphtheria	Scarlet fever	Whooping cough	Measles
1910	67	87	17.2	9.2	4.7	5.7	2.7
1911	69.3	103	14.1	7.8	4	4.1	5.6
1912	63.7	78	11.6	5.3	2.4	5.4	3
1913	54	82	10.8	7.1	3.1	4.9	5.1
1914	52.2	90	9.8	6.9	2.9	4.2	1.2
1915	51.4	85	8.5	5.7	1.9	6.2	3.9
1916	50	*	*	*	*	*	*
1917	57	*	*	*	*	*	*
1918	58.4	109	6.6	8.9	4.6	11	8.6
1919	48.9	80	4.5	7.4	2.2	24.8	9
1920	45.8	112	4.7	7.6	3.5	11	3.8
1921	58.8	90	4.9	14.7	5.3	4.9	3

*Figures not available.

MARRIAGES AND DIVORCES REPORTED FOR THE FISCAL YEARS ENDING JUNE 30, 1921 AND JUNE 30, 1922.

County	July 1, 1920, to June 30, 1921		July 1, 1921 to June 30, 1922	
	Marriages	Divorces	Marriages	Divorces
Adair	105	.....	73	8
Adams	106	7	82	12
Allamakee	147	7	122	4
Appanoose	282	84	264	49
Audubon	90	10	79	2
Benton	161	34	131	31
Blackhawk	740	161	594	136
Boone	360	35	299	30
Bremer	208	8	157	12
Buchanan	209	17	132	21
Buena Vista	154	26	132	17
Butler	108	12	102	14
Calhoun	.....	.....	117	14
Carroll	171	.....	158	6
Cass	199	23	167	20
Cedar	102	10	78	12
Cerro Gordo	467	.....	400	71
Cherokee	145	20	122	24
Chickasaw	202	4	161	3
Clarke	96	14	97	17
Clay	142	20	134	13
Clayton	185	14	150	18
Clinton	513	61	463	57
Crawford	169	11	160	18
Dallas	210	31	243	34
Davis	106	9	106	15
Decatur	119	11	133	25
Delaware	153	14	149	17
Des Moines	496	56	307	68
Dickinson	108	15	90	11
Dubuque	773	52	804	51
Emmett	188	16	105	12
Fayette	226	28	178	23
Floyd	208	31	134	30
Franklin	142	11	102	12
Fremont	87	11	115	18
Greene	144	11	131	12
Grundy	93	3	60	6
Guthrie	118	14	119	25
Hamilton	194	17	157	25
Hancock	101	3	88	4
Hardin	173	.....	137	18
Harrison	177	27	181	32
Henry	145	15	139	23
Howard	127	5	96	3
Humboldt	95	5	64	12
Ida	98	9	81	8
Iowa	168	.....	133	6
Jackson	187	21	155	19
Jasper	253	22	215	29
Jefferson	154	27	129	18
Johnson	344	37	323	34
Jones	141	8	142	18
Keokuk	161	17	137	15
Kossuth	210	.....	170	11
Lee	543	112	514	112
Linn	998	276	829	198
Louisa	68	.....	72	10
Lucas	153	19	118	19
Lyon	139	6	114	4
Madison	114	13	71	11
Mahaska	318	61	264	40
Marion	220	23	178	23
Marshall	419	117	313	93
Mills	136	19	163	14
Mitchell	112	8	83	10
Monona	154	19	143	10
Monroe	235	44	196	40
Montgomery	177	12	138	14
Muscatine	341	72	324	65
O'Brien	155	11	125	16

MARRIAGES AND DIVORCES—Continued

County	July 1, 1920, to June 30, 1921		July 1, 1921 to June 30, 1922	
	Marriages	Divorces	Marriages	Divorces
Osceola	55	9	81	11
Page	216	34	171	40
Palo Alto	121	8	86	11
Plymouth	180	.....	152	5
Pocahontas	114	20	101	6
Polk	2,417	841	2,182	837
Pottawattamie	1,010	217	1,132	197
Poweshiek	228	15	138	15
Ringgold	92	16	83	9
Sac	154	8	115	20
Scott	1,013	189	735	181
Shelby	113	.....	102	6
Sioux	221	9	175	12
Story	253	38	258	23
Tama	158	25	148	17
Taylor	101	13	96	11
Union	102	45	189	14
Van Buren	48	9	72	10
Wapello	813	97	484	134
Warren	157	.....	135	10
Washington	149	19	116	19
Wayne	111	18	119	17
Webster	484	65	418	59
Winnebago	110	5	89	8
Winneshiek	186	11	142	9
Woodbury	1,456	371	1,037	348
Worth	87	10	69	7
Wright	172	16	126	14
Total	25,383	4,010	21,736	3,988

STILLBIRTHS, BIRTHS AND DEATHS REPORTED FOR CALENDAR YEARS 1920 AND 1921

County	1920			1921		
	Stillbirths	Births	Deaths	Stillbirths	Births	Deaths
Adair	5	292	120	7	352	96
Adams	2	268	108	8	209	87
Allamakee	9	311	156	12	359	133
Appanoose	11	606	378	16	639	355
Audubon	9	288	110	10	306	86
Benton	8	562	213	22	530	179
Blackhawk	3	1,608	592	41	1,177	691
Boone	12	602	337	24	560	318
Bremer	6	249	190	10	354	149
Buchanan	4	409	218	19	358	267
Buena Vista	14	385	196	12	387	111
Butler	4	389	171	13	384	185
Calhoun	5	431	172	10	408	152
Carroll	8	437	230	15	365	189
Cass	15	439	201	7	448	197
Cedar	10	268	122	11	268	144
Cerro Gordo	21	777	290	45	836	325
Cherokee	7	417	284	21	326	212
Chickasaw	4	300	124	4	278	129
Clarke	2	197	91	13	216	85
Clay	7	397	125	14	386	121
Clayton	3	504	246	19	480	197
Clinton	20	695	489	28	830	509
Crawford	8	431	195	14	382	171
Dallas	5	496	238	7	500	245
Davis	8	262	110	6	270	93
Decatur	4	340	143	5	330	150
Delaware	11	348	183	12	357	173
Des Moines	24	653	492	31	692	505
Dickinson	9	264	88	6	215	98
Dubuque	14	990	725	27	1,239	741
Emmet	13	328	123	8	294	107
Fayette	15	518	254	28	576	238
Floyd	12	386	169	11	339	185
Franklin	8	376	131	12	339	134
Fremont	2	317	158	5	321	125
Greene	7	331	134	15	373	143
Grundy	8	244	88	14	331	86
Guthrie	7	405	161	13	352	151
Hamilton	14	540	230	10	505	185
Hancock	2	293	118	13	326	95
Hardin	7	425	245	18	449	209
Harrison	10	323	211	16	500	200
Henry	2	285	235	12	245	241
Howard	9	295	131	6	291	85
Humboldt	9	303	113	3	298	108
Ida	6	343	106	10	294	77
Iowa	3	370	177	8	379	189
Jackson	11	490	255	10	550	282
Jasper	13	577	309	18	589	249
Jefferson	7	309	172	8	347	172
Johnson	15	608	490	21	644	496
Jones	6	366	148	14	375	122
Keokuk	9	351	218	6	370	160
Kossuth	11	667	209	18	735	170
Lee	22	635	523	15	657	550
Linn	41	835	777	67	1,208	865
Louisa	2	216	117	4	243	112
Lucas	6	320	127	6	299	124
Lyon	5	422	140	12	391	96
Madison	11	294	162	12	308	125
Mahaska	7	478	323	12	462	230
Marion	12	492	293	10	498	278
Marshall	10	585	452	30	596	329
Mills	11	307	185	7	353	144
Mitchell	5	337	152	10	349	128
Monona	8	433	136	5	430	124
Monroe	3	399	242	10	484	222
Montgomery	7	352	200	10	314	192
Muscatine	12	566	321	15	562	454
O'Brien	7	514	143	12	484	115
Osceola	7	315	81	9	305	67

STILLBIRTHS, BIRTHS AND DEATHS—Continued

County	1920			1921		
	Stillbirths	Births	Deaths	Stillbirths	Births	Deaths
Page	11	486	343	17	482	305
Palo Alto	4	445	89	10	411	90
Plymouth	7	545	212	17	509	206
Pocahontas	7	346	135	15	219	110
Polk	78	2,914	2,028	156	3,183	1,650
Pottawattamie	40	1,338	682	54	1,380	700
Poweshiek	3	450	198	16	430	193
Ringgold	12	253	122	4	316	79
Sac	9	420	151	11	392	144
Scott	26	1,181	804	50	1,318	899
Shelby	5	359	126	8	417	112
Sioux	11	748	227	23	723	176
Story	21	657	252	16	640	277
Tama	10	434	227	13	427	204
Taylor	5	204	137	10	246	138
Union	7	201	186	10	333	191
Van Buren	6	244	165	16	240	130
Wapello	14	627	467	20	761	581
Warren	10	389	231	4	417	168
Washington	8	430	200	11	437	201
Wayne	17	325	158	8	311	155
Webster	17	874	405	28	961	448
Winnebago	8	350	105	13	344	104
Winneshiek	13	443	268	14	478	194
Woodbury	48	1,967	1,218	79	2,050	1,127
Worth	5	282	71	4	255	107
Wright	8	514	185	13	486	148
Total	1,182	48,813	25,897	1,680	49,977	24,611

DEATHS—1920-1921

Total for calendar year 1920		25,897
Total for calendar year 1921		24,611
	1920	1921
Male	13,286	13,100
Female	12,611	11,511
Under one year	3,243	2,961
1 to 5 years	1,318	1,079
5 to 10 years	546	868
10 to 20 years	1,136	1,051
20 to 30 years	1,916	1,395
30 to 40 years	1,967	1,484
40 to 50 years	2,565	1,697
50 to 60 years	2,429	2,571
60 to 70 years	3,598	3,589
70 to 80 years	4,457	4,498
80 to 90 years	2,926	3,017
90 years and over	464	524
Unknown	42	97
White	25,664	24,301
Colored	233	310
Native	21,063	20,151
Foreign	4,824	4,248
Unknown		212
Single	8,720	7,805
Married	10,790	10,211
Widowed	5,877	6,052
Divorced	327	247
Unknown	173	196

CAUSES OF DEATH

Typhoid fever	112	120
Smallpox	12	22
Measles	91	72
Scarlet fever	132	130
Whooping cough	265	119
Diphtheria and croup	184	355
Influenza	1,681	325
Erysipelas	69	36

DEATHS, 1920-1921—Continued

Septicaemia	219	66
Rabies	2	3
Tetanus	44	45
Tuberculosis of lungs	1,098	1,423
Tuberculosis meningitis	46	29
Other forms of T. B.	93	128
Venereal diseases	53	34
Malarial fever	0	1
Cancer and other malignant tumors	2,193	2,164
Rheumatism	95	162
Diabetes	459	422
Exophthalmic goitre	54	48
Leukemia	54	45
Anaemia	286	317
Alcoholism	15	21
Encephalitis	50	69
Simple meningitis	175	206
Locomotor ataxia	32	27
Acute anterior poliomyelitis	112	121
Cerebral hemorrhage	1,835	2,316
Paralysis	311	410
Insanity	202	168
Epilepsy	69	101
Convulsions	85	85
Neuralgia	13	24
Diseases of the ears	42	26
Acute endocarditis	165	195
Diseases of the heart	2,828	1,216
Angina pectoris	251	280
Diseases of arteries	561	737
Embolism, thrombosis	118	155
Hemorrhage	235	187
Bronchitis	75	278
Bronchopneumonia	665	583
Pneumonia	2,029	1,600
Asthma	170	99
Septic throat	80	103
Ulcer of stomach	109	111
Diarrhoea, enteritis (Under two years)	129	297
Diarrhoea, enteritis (Two years and more)	614	447
Appendicitis, typhilitis	331	387
Hernia	313	637
Cirrhosis of liver	168	152
Gallstones	190	332
Peritonitis	150	120
Nephritis, Bright's disease	1,866	1,797
Disease of prostate	109	181
Noncancerous tumors of female organs	61	25
Puerperal septicaemia	110	68
Other puerperal diseases	191	189
Gangrene	80	81
Malformations	467	1,092
Premature birth	1,164	1,022
Senility	748	749
Suicide	114	78
Poisoning by food	88	82
Burns	155	112
Asphyxiation	62	13
Acute poisonings	0	32
Diseases of liver	0	43
Chronic occupation poisonings	0	5
Accidental drowning	79	149
Traumatism by firearms	157	168
Traumatism by cutting	85	98
Traumatism by fall	96	84
Traumatism in mines	34	16
Railroad accidents	165	124
Street car accidents	7	19
Automobile accidents	161	172
Motorcycle accidents	6	13
Injuries by other vehicles	91	0
Injuries by animals	47	40
Effects of heat	4	13
Other external violence	32	42
Lightning	12	17
Electricity	23	26
Fractures	58	72
Not specified	278	510
Traumatism by machines	6	46
Traumatism by crushing	0	18

CIVIL AND SANITARY ENGINEER

H. V. PEDERSEN, Engineer

Iowa has made progress in the work of sanitation since the state board of health was organized. Many towns, which ten years ago paid little or no attention to how the garbage or sewage was disposed of or whether the public water supply was safe for drinking or not, rank high today among the towns having modern public utilities. The engineering department has had a great influence in keeping Iowa towns in the race of modern sanitary progress and no matter how small or how large the community visited, some good influence always has been left behind that sooner or later brings forth good fruits.

During the year ending June 30, 1922, the engineering department visited 212 towns and cities of the state for the purpose of giving sanitary emergency advice and for making recommendations. Out of these 212 sanitary surveys 166 pertained to public water supplies, 32 to sewage problems and 14 to other unsanitary conditions. Out of the 166 places visited for the purpose of inspecting water supplies 89 were in connection with interstate railway water certification as required by the United States public health service.

Out of the total of 89 water supplies used for drinking and culinary purposes on railroads, 23 were given unfavorable certification. All of these were railroad-owned supplies which consisted chiefly of shallow wells, poorly located and poorly constructed.

Except for the railway water supplies all sanitary surveys were made in response to requests from city and town councils or properly signed petitions. There are usually many on the waiting list that have requested sanitary engineering aid and which are desirous of taking advantage of the advice offered by this department.

In the case of water supplies, a survey of the system is made to find any source of contamination or any defective piece of construction whereby surface water might find its way into the public water supply. After the survey a detailed report is written and sent to the council or local board of health giving a description of the existing conditions with conclusions and recommendations for bettering them.

Most of the work pertaining to sewage consists of inspecting sewage treatment plants and teaching new councils and new operators what enters into the proper operation of the plant. Many of the plants visited where laboring under difficulties, caused by lack of proper cleaning, and some were so bad as to have ceased to function.

The office work of the department consists of answering letters of inquiry, compiling data, writing reports and approving plans of new water and sewer systems. During the past year a total number of 62 plans were approved. Out of this total 21 were plans for complete sewer systems in-

cluding the sewage treatment plants, 6 were plans for complete water systems, 1 was a plan for a water purification plant, 3 were plans for sewage treatment plants. The rest were for extensions to either sewer or water systems.

Regardless of the work that has been and is still being done by the engineer of the state board of health there is still a great deal in sanitation that has never been touched upon. The many duties given the engineer by the board makes it impossible for one man to cover the state and do justice to the work. Sanitary engineering is purely a preventive medium and as such there are no limits to the results that can be obtained if the engineering department were given the opportunity. Iowa has no scientific knowledge of the sanitary conditions of its rivers. No sanitary surveys have ever been made to promote rural sanitation, especially that of the rural schools; and the sanitation of tourist's camps, swimming pools and so on exist only as a dream in the mind of the engineer. Before Iowa can expect to keep its place in the progress of sanitation it must create a division of sanitary engineering of such magnitude as to make it possible to actually carry on the work of preserving and promoting the general health of the public in the way that is expected of it.

FIELD TRIPS AND INVESTIGATIONS

Places investigated, population, the purpose of the investigation.

Spirit Lake, 1,701, June 21, 1921. Made inspection of public water supply and advised with council concerning construction of water purification plant.

Colfax Sanitarium, June 24, 1921. Made sanitary survey of government hospital and recommended new improvements.

Iowa City, July 26, 1921. Consultation with Mr. J. J. Hinman, Jr., on matter of railway water inspection and certification.

Bayard, 727, July 8, 1921. Sanitary survey of town in connection with disposal of wastes.

Mount Ayr, 1,738, August 2 and 3, 1921. Sanitary survey of water supply and inspection of the four sewage treatment plants.

Estherville, 4,699, August 9, 1921. Made sanitary survey of water supply to determine possible sources of contamination.

Graettinger, 779, August 9, 1921. Inspected public water supply and recommended improvements to town well.

Laurens, 914, August 9, 1921. Inspected proposed changes in sewer system prior to approval.

Nora Springs, 1,055, August 10, 1921. Consulted with town council to help settle the question of change in proposed location of sewer line.

Charles City, 7,350, August 11, 1921. Inspected new sewage treatment plant. Also investigated proposed changes in water system.

Osage, 2,878, August 11, 1921. Inspected both sewage treatment plant and water works system at the request of city council.

Seymour, 1,746, August 17, 1921. Inspected sanitary condition of town alleys relative to outside toilets and rubbish.

Keosauqua, 851, August 18, 1921. Made sanitary survey of town relative to the safety of various private water supplies.

Audubon, 2,108, August 19, 1921. Inspected sanitary conditions of rendering plant located west of the city.

Keosauqua, September 7, 1921. Met with open meeting of town council to discuss advisability of installing sewer system.

Sidney, 1,154, September 13, 1921. Made inspection of public water supply and recommended improvements to prohibit surface contamination.

Tabor, 1,186, September 14, 1921. Inspected water and sewer systems and reported on condition of sewage treatment plant.

Sumner, 1,511, September 20, 1921. Inspected operation of sewage treatment plant.

Preston, 648, September 21, 1921. Made sanitary survey of water system and inspected sewage treatment plant.

Casey, 368, September 27, 1921. Made survey of unsanitary conditions and requested town council to abate a public nuisance.

Vail, 625, September 29, 1921. Made sanitary survey of water system and reported results to town council with recommendations for betterment.

Stanhope, 400, October 8, 1921. Inspected new sewer system prior to town acceptance.

Glidden, 867, October 12, 1921. Inspected public water supply.

Ames, October 26, 27 and 28, 1921. Attended conference of sewage treatment plant operators.

Omaha, November 1, 2 and 3, 1921. Attended conference of the Iowa section of the American water works association.

Schaller, 721, November 3 and 4, 1921. Made inspection of public water supply.

Grinnell, 5,362, November 9, 1921. Made inspection of sewage treatment plant in order to advise proper improvements.

Marion, 4,128, November 10, 1921. Inspected sewage treatment plant in response to petition received from citizens.

Mason City, 20,065, November 18, 1921. Inspected Northern Sugar Corporation, Decker Packing plant and city sewage treatment plant in regard to pollution of Lime Creek.

Clear Lake, 2,804, November 19, 1921. Inspected city water supply.

Rockford, 1,021, November 19, 1921. Inspected public water supply and the condition of Shell Rock river.

Marble Rock, 483, November 19, 1921. Inspected public water supply and condition of the Shell Rock river.

Greene, 1,375, November 19, 1921. Inspected public water supply and condition of the Shell Rock river.

Dallas, 643, November 27, 1921. Inspection of sewer outlet from the town of Melcher which passed through Dallas.

Melcher, 1,582, November 27, 1921. Inspection of sanitary sewer system and advised installation of sewage treatment plant.

Iowa City, December 12, 1921. Consultation with J. J. Hinman, Jr.

Independence, 3,672, December 19, 1921. Inspected poultry packing plant at request of city council.

Waukon, 2,359, December 20, 1921. Inspected sewage treatment plant to determine efficiency of plant and the seriousness of the nuisance caused by the effluent discharging into a dry creek.

Sioux Center, 1,389, January 19, 1922. Conference with the town officials relative to the installation of sanitary sewer system which was not duly approved by the Iowa state board of health.

Farley, 651, January 26, 1922. Made survey of existing conditions and had conference with town council relative to location of new public water supply and removal of possible sources of pollution.

Cresco, 3,195, February 7, 1922. Sanitary survey of public water supply and sewage treatment plant.

Lime Springs, 595, February 8, 1922. Made sanitary survey of town at request of mayor in order to report conditions to state board of health.

Maynard, 387, February 9, 1922. Conferred with town health officials concerning the necessary measures to be taken to protect public water supply.

Lisbon, 803, February 21, 1922. Made sanitary survey of town to determine possible source of pollution to water supply.

Marshalltown, 15,731, March 1, 1922. Conferred with city council relative to repairing broken water main in river and sterilizing mains after break was repaired.

Centerville, 8,486, March 8, 1922. Inspected sewage treatment plant and recommended to city council the construction of a larger septic tank.

Moulton, 1,307, March 8, 1922. Made sanitary survey of location of proposed new impounding reservoir.

Marshalltown, March 10, 1922. Second conference with city council regarding repair of broken water main and purification of water.

Lime Springs, March 14, 1922. Posted placard notifying the traveling public that the public water supply was condemned because of its insanitary quality.

Sheffield, 1,106, March 16th, 1922. Made inspection of public water supply.

Cedar Rapids, 45,556, April 4, 1922. Inspected new improvements to municipal water works.

Norway, 463, April 5, 1922. Inspected public dump ground and conferred with members of town council relative to improving its condition.

Fairfield, 5,984, April 17, 1922. Inspected new improvements to water purification plant.

Fort Madison, 12,066, April 18, 1922. Inspected privately owned public water plant.

Fort Des Moines, April 26, 1922. Investigated complaints concerning insanitary conditions.

Valley Junction, 3,631, April 28, 1922. Inspected banks of Raccoon river relative to complaints made by Des Moines Water Works Co.

West Okoboji, May 3, 1922. Inspected sewage treatment plant located on the Y. W. C. A. camping grounds and conferred with the director relative to future improvements.

Fonda, 1,136, May 4, 1922. Inspected sewage treatment plant and conferred with town council relative to necessary repairs needed to put plant in operation.

Cherokee, State Hospital, May 4, 1922. Inspected water system at request of state board of control.

Sac City, 2,630, May 5, 1922. Investigated complaints relative to the discharging of sewage into open streams.

Cresco, 3,190, May 8, 1922. Consulted with city council relative to preventing a bottling works from discharging its waste waters into a well pit located near city well.

Calmar, 1,039, May 8, 1922. Consulted with local board of health relative to removal of town dump ground as petitioned by a number of residents living near the dump.

Mount Vernon, 1,466, May 9, 1922. Inspected town sewage treatment plant at request of council.

Van Horn, 524, May 10, 1922. Made sanitary survey of town and held conference with town council relative to drainage problem.

Melcher, May 25, 1922. Second inspection of sewer outlet of Melcher at request of town of Dallas, and conferred with town council of Melcher regarding the immediate installation of a sewage treatment plant.

Des Moines, 126,568, June 1, 1922. Inspection of a number of small sewage treatment plants in the city with respect to the pollution of the Raccoon river.

Marshalltown, June 6, 1922. Inspection of new city water works improvements.

New Vienne, 241, June 8, 1922. Inspected public water supply at request of town council, also conferred with council relative to installation of sewer system.

Audubon, 2,108, June 12, 1922. Inspected public water supply and conferred with city council relative to necessary improvements for making water safe.

Odebolt, 1,445, June 13, 1922. Inspected sewage treatment plant and public water works system, and conferred with council relative to necessary improvements.

Jewell, 1,090, June 14, 1922. Inspected sewage treatment plant and conferred with council relative to necessary improvements.

Boone, 12,541, June 20, 1922. Made investigation to determine source of bad taste in water.

Hampton, 2,992, February 22, 1922. Inspected sewage treatment plant and instructed operator as to care of same.

Clarion, 2,826, February 23, 1922. Inspected sewage treatment plant and instructed operator as to care of same.

Avoca, 1,482, March 14, 1922. Made sanitary survey of town and conferred with town council relative to removing sources of pollution to water supply.

Exira, 840, March 15, 1922. Inspected town water supply and recommended removal of several sources of pollution.

Riverside, 667, March 17, 1922. Inspected public water supply.

Crawfordsville, 337, March 17, 1922. Inspected public water supply.

Winfield, 1,027, March 18, 1922. Inspected public water supply and sewage treatment plant.

Osceola, 5,684, April 6, 1922. Inspected sewage treatment plant and conferred with mayor and city health officer relative to proper operation and improvements.

Audubon, 2,108, April 13, 1922. Inspected city water supply and sewage treatment plant.

Pleasantville, 859, May 2, 1922. Made investigation of complaint relative to improper disposal of sewage.

Knoxville, 3,523, May 2, 1922. Inspected city water supply and sewage treatment plants.

Mediapolis, 780, May 6, 1922. Inspected public water supply.

Brooklyn, 1,533, May 15, 1923. Inspected sewage treatment plant at request of city council and recommended necessary improvements.

Raccoon River Investigation, May 17, 1922. Made survey of banks of river above Des Moines relative to locating sources of pollution to Des Moines city water supply.

Prairie City, 780, May 25, 1922. Inspected complaint of drain tile system and conferred with council regarding installation of sewer system.

New London, 1,144, June 1, 1922. Investigated nuisance, at request of school board, caused by discharging sewage in school yard.

Wayland, 627, June 2, 1922. Made investigation of stock yards on receipt of petition.

Indianola, 780, June 3, 1922. Made investigation of small stream carrying objectionable materials through the town.

St. Charles, 430, June 26, 1922. Investigated nuisance caused by outlet of cess pool from school house.

Villisca, 2,111, June 21, 1922. Inspected stock yards at request of city council.

Toledo, 1,604, June 22, 1922. Inspected town water supply and sewage treatment plant.

Burt, 626, June 27, 1922. Inspected town water supply and sewage treatment plant.

Clear Lake, 2,804, June 28, 1922. Inspected city sewage treatment plant.

OFFICE WORK OF THE ENGINEER

Approval of Plans and Specifications

Graettinger, 778. June 17, 1921. Plans and specifications for proposed extensions to water system as prepared by the Currie Engineering Co.

St. Ansgar, 844. June 17, 1921. Plans and specifications for complete sewer system as prepared by W. E. Buell & Co. Sewage treatment plant consists of Imhoff tank with trickling filters.

Waterloo, 26,230. June 18, 1921. Plans for several proposed sewer extensions in outlying streets.

Maynard, 587. June 28, 1921. Plans and specifications for proposed extensions to water system as prepared by Currie Engineering Co.

Creston, 8,634. July 1, 1921. Plans and specifications for proposed extension to sewer system as prepared by P. K. De Voe.

Lost Nation, 537. July 11, 1921. Plans and specifications for complete sewer system, designed to serve the town in one sewer district, prepared by Currie Engineering Co. Treatment plant consists of Imhoff tank and trickling filters.

Keystone, 558. July 11, 1921. Plans and specifications for complete sewer system as prepared by Currie Engineering Co. Treatment plant consists of Imhoff tank, sludge bed and trickling filters.

Indianola, 3,628. July 16, 1921. Plans and specifications for proposed remodeling of old septic tank and addition of trickling filters as prepared by Lafayette Higgins.

Dubuque, 39,141. August 4, 1921. Plans for proposed 6-inch sewer extensions to connect with old 6-inch system as prepared by the city of Dubuque.

Cresco, 3,195. August 23, 1921. Plans for proposed extensions to sewer system as prepared by J. H. Howe.

Dysart, 955. August 24, 1921. Plans and specifications for proposed 4-inch water extensions as prepared by M. D. Barber.

Fort Madison, 12,066. August 26, 1921. Plans for proposed changes in sewer system as prepared by Burns and McDonald.

Cresco, 3,195. September 6, 1921. Plans and specifications for proposed extensions to sewer system as prepared by J. H. Howe.

Newell, 869. September 10, 1921. Plans and specifications for complete sewer system as prepared by Price and McCormick. Treatment plant consists of Pacific Flush Tank Co. ejector, septic tank and either intermittent sand filters or rock trickling filters.

Lakewood Park. September 12, 1921. Plans and specifications for complete sewer system as prepared by A. E. Holmes. Treatment plant consists of septic tank and intermittent sand filters.

Keosauqua, 851. September 12, 1921. Plans and specifications for complete sewer system as prepared by J. W. Early. Treatment plant consists of septic tank and intermittent sand filters.

Nashua, 1,317. October 5, 1921. Plans and specifications for complete sewer system as prepared by W. E. Buell & Co. Treatment plant consists of Imhoff tank and trickling filters.

Perry, 5,642. October 21, 1921. Plans for proposed extensions to sewer system on First street, Third street and Center street as prepared by R. C. Lutze.

Stanton, 749. November 4, 1921. Plans for proposed extension to water system as prepared by T. S. De Lay.

Waterloo, 36,230. November 14, 1921. Plans for proposed sewer extension on Euclid, Leland, Logan, Richer, Peck, Denver and Oakland streets as prepared by R. B. Slippy.

Albert City, 567. November 30, 1921. Plans and specifications for proposed complete water works system as prepared by W. E. Buell & Co.

Edgewood, 617. November 21, 1921. Plans and specifications for complete water system as prepared by W. E. Buell.

Sioux Center, 1,339. December 19, 1921. Plans and specifications for complete sewer system as prepared by J. A. Rowat. Treatment plant consists of two Imhoff tanks, lift station and trickling filters.

Riverside, 667. December 16, 1921. Plans and specifications for complete sewer system as prepared by Price & McCormick. Treatment plant consists of septic tank, siphon chamber and intermittent sand filter.

Decorah, 4,039. December 27, 1921. Plans for 2,200 feet of 8-inch sewer extension as prepared by A. N. Hansen.

Wesley, 444. December 28, 1921. Plans for 3,500 feet of 4-inch water extension as prepared by Currie Engineering Co.

Vail, 625. January 5, 1922. Plans and specifications for a sanitary sewer system prepared by W. E. Buell Engineering Co. The plans provide for the sewering of one sewer district which takes in most of the town. The sewage treatment plant consists of an Imhoff tank, siphon chamber and housed trickling filter.

West Side, 405. January 5, 1922. Plans and specifications for a sanitary sewer system prepared by W. E. Buell Engineering Co. The plans provide for the sewering of one sewer district which takes in most of the town. The sewage treatment plant consists of an Imhoff tank, siphon chamber and housed trickling filter.

Collins, 570. January 7, 1922. Plans and specifications for water works system extension, submitted by Currie Engineering Co. which provides for the addition of 4-inch mains to the system and the erection of a steel storage and pressure tower.

North English, 933. January 11, 1922. Plans and specifications for sanitary sewer system, submitted by H. R. Green. Sewage treatment plant consists of square shaped tank with hopper shaped bottom, siphon chamber and intermittent sand filter.

Farmington, 1,085. January 12, 1922. Plans and specifications for sanitary sewer system, submitted by W. E. Buell Engineering Co. The plans provide for the sewering of one sewer district which includes the greater part of the town. The sewage treatment plant consists of an Imhoff tank, siphon chamber and a trickling filter.

Blairsburg, 380. January 13, 1922. Plans and specifications for water works system, submitted by Currie Engineering Co. The plans provide for water mains, pump house and steel elevated pressure and storage tank.

Wyoming, 690. January 24, 1922. Plans and specifications for sanitary sewer system, submitted by W. E. Buell Engineering Co. The plans provide for sewage treatment plant, consisting of an Imhoff tank and trickling filter. The town can be sewered in one sewer district.

Hopkinton, 759. January 24, 1922. Plans and specifications for sanitary sewer system, submitted by W. E. Buell Engineering Co. The plans provide for the sewering of the town in one sewer district. The sewage treatment plant consists of an Imhoff tank, siphon chamber and trickling filter.

Clarksville, 1,002. February 1, 1922. Plans and specifications for sanitary sewer system, submitted by Paul Graham. The plans are a revision of an old set already on file and provide for the sewering of the town in one sewer district. The sewage treatment plant consists of a Cameron type septic tank, siphon chamber and trickling filter.

Columbus Junction, 985. February 11, 1922. Plans for sewer extension, submitted by W. E. Buell Engineering Co. The plans provide an 8-inch sewer on Second and Gamble streets.

Manning, 1,842. February 11, 1922. Plans and specifications for water works improvements, submitted by K. C. Gaynor. Plans provide for a new well, pump equipment and pump house.

Coggon, 553. February 12, 1922. Plans and specifications for a sanitary sewer system, submitted by Currie Engineering Co. Plans provide for sewering the town in one sewer district which covers the greater part of the town. The sewage treatment plant consists of a Cameron septic tank, siphon chamber and intermittent sand filters.

Earlville, 619. February 13, 1922. Plans and specifications for sanitary sewer system, submitted by Currie Engineering Co. Plans provide for sewering the town in one sewer district. Sewage treatment plant consists of a Cameron septic tank, siphon chamber and intermittent sand filter.

Moulton, 1,287. February 14, 1922. Plans and specifications for water works system, submitted by the Henningson Engineering Co. Plans provide for a water shed, impounding reservoir, dam, pump house and equipment.

Granger, 324. February 16, 1922. Plans and specifications for a complete water works system, submitted by Lafayette Higgins. Plans provide for water mains, well and pump equipment, pump house and 40,000 gallons capacity, 100-foot steel tower.

McIntire, 514. February 27, 1922. Plans and specifications for water works system, submitted by the Currie Engineering Co. Plans provide for water mains, well and pump equipment and elevated steel pressure and storage tank.

Davenport. March 4, 1922. (Western States Portland Cement Co.) Plans provide for a sewage treatment plant consisting of a septic tank and pump pit, to take care of the sewage from cement plant.

Moulton, 827. March 8, 1922. Plans and specifications for sanitary sewer system, submitted by Henningson Engineering Co. Plans provide for the sewering of the entire town in one sewer district. The sewage treatment plant consists of Imhoff tank, siphon chamber and trickling filters.

Exira, 840. March 10, 1922. Plans and specifications for a sanitary sewer system, submitted by W. E. Buell Engineering Co. Plans provide for the sewering of town in one sewer district. The sewage treatment plant consists of Imhoff tank, siphon chamber and intermittent sand filters.

Gray, 196. March 11, 1922. Plans and specifications for a complete water works system. Plans provide for water mains, 8-inch diameter well, pump equipment, pump house and 40,000 gallon capacity, steel, elevated, pressure and storage tower.

Waukon, 2,359. March 17, 1922. Plans and specifications for concrete water reservoir, having a capacity of approximately 500,000 gallons.

Maxwell, 811. April 1, 1922. Plans and specifications for sanitary sewer system prepared by Currie Engineering Co. The plans provide for the sewering of one sewer district which takes in the entire town. The sewage treatment plant consists of a septic tank, trickling filters, sludge bed and lift station.

Mount Ayr, 1,738. April 7, 1922. Plans and specifications for a water purification plant prepared by L. W. Cox. The plant consists of a low duty pump and pump pit, a four compartment coagulation basin, two filters of the rapid sand type, a clear well and high duty pumps and pump house.

Hampton, 2,993. April 14, 1922. Plans and specifications for a sewer extension prepared by Currie Engineering Co. Extension consists of sewer on Tenth street between Washington and Dodge with short branches on all streets between these. Branches running short distances both north and south. Also a short extension on Thompson street between Third and Sixth streets.

Bristow, 289. April 15, 1922. Plans and specifications for a water works system prepared by Currie Engineering Co. System consists of four and six-inch water mains, a 40,000-gallon, 100-foot steel tower, an eight-inch drilled well 150 feet deep, a pump house and pump equipment.

DeWitt, 1,849. May 8, 1922. Plans and specifications for deep drilled well to furnish public water supply for the town.

Modale, 381. May 11, 1922. Plans and specifications for complete water works system, including pumps, pump house, elevated pressure and storage tank and 4-inch and 6-inch mains.

Dubuque, 39,141. May 12, 1922. Plans for sewer extension on Fourteenth street, alley between Elm and Washington streets, alley between Pine and Elm streets, Jackson street and Lemon street.

Decorah, 4,039. May 23, 1922. Plans for sewer extension on Hill street between North Ohio street and State road.

Dubuque, 39,141. June 2, 1922. Plans for 6-inch sewer extension on Bryant, Rush, Holly and High streets.

New London, 1,144. June 15, 1922. Plans and specifications for 100,000-gallon concrete water reservoir.

Dubuque, 39,141. June 23, 1922. Plans for sewer extensions on Cox, Pierce, Angella and Kleine streets.

Charles City, 7,350. June 24, 1922. Plans and specifications for water extensions on Fifth street, Main to Johnson; Johnson street, Fifth to Third; Joslin street, Ferguson to Spriggs; North street, Scott to Cottage court; and Cottage court from North to St. Charles.

Oelwein, 7,455. June 30, 1922. Plans for a number of very short sewer extensions.

LABORATORIES

Don M. Griswold, Ph. G., M. D., M. P. H., Director

During the biennial period ending June 30, 1922, the laboratory has experienced its greatest growth. During the preceding biennium the number of specimens examined in these laboratories amounted to 129,705. During the biennium covered by this report, the number of specimens examined was 298,978, an increase of 130 per cent.

To maintain the standard of the scientific work handled, the laboratories must receive financial support, somewhat in proportion to the increased demands upon its facilities.

I. BACTERIOLOGICAL DIVISION

R. L. Laybourn, Chief

WORK OF THE BACTERIOLOGICAL DIVISION

The Bacteriological Division is authorized to make all examinations (other than water analyses and venereal disease examinations) which are directly related to the control of communicable diseases. Examinations for diphtheria, tuberculosis, typhoid fever and rabies constitute the major portion of the work which the division is called upon to do. Requests for many of the less frequently used examinations are becoming more and more frequent and it may reasonably be expected that the number of these miscellaneous examinations which will be requested during the next biennium will be increased materially. This trend in the use of the laboratories is to be commended and encouraged but it must be remembered that these examinations demand much in the why of special preparations and time and these demands must be met by larger quarters and increased personnel.

Very little understanding seems to exist over the state as to the various types of work which the laboratories are authorized to do. As a consequence this division has had to assume the role of a state laboratory clearing house since scarcely a day passes that at least one specimen is received which the laboratories are neither equipped or authorized to do. Such specimens are forwarded to the proper university or state authorities and the sender is notified of the disposal of the specimen. Many specimens are also received which no one is authorized by the state laws to handle. As a matter of accommodation to persons sending in such specimens, they are turned over to some competent person who makes the examination as private work and charges a fee. In order to avoid misunderstandings and criticisms all such specimens are reported and collections made through this office.

One of the most important problems which the laboratories have to contend with is in connection with improper addresses and insufficient identification of specimens. Many specimens intended for the Laboratories For The State Board of Health are addressed to the University Hospital or University Laboratories with a consequent delay in reaching their proper destination. Many properly addressed specimens are also received without any identification. Some of these can be identified by the postmark and the sender located but there is always a considerable number which give no clew as to their source.

AMOUNT OF WORK DONE

The amount of work which the Bacteriological Division is called upon to do varies so widely from month to month that the problem of maintaining an adequate staff is very difficult. In July, 1921, the total for the division was 2,745. The following month the total rose to 5,834 (more than 100 per cent increase over the preceding month) and during the month of September it reached 10,191. The month of October reached the mark of 19,868, or almost seven times the total for the month of July. After the peak was passed in November, there followed a decrease almost as rapid as had been the increase.

While the laboratory staff is superlatively loyal and attempts to meet the demands of these wide variations in so far as is physically possible, there are times when it is impossible to handle all the work as promptly as should be done. A certain portion of the work can be done by unskilled workers on an hourly basis but this only partly solves the problem since reliable technical workers cannot be employed for a few weeks or months as they are needed. The only solution of the problem is to have sufficient funds and space available to enable the laboratories to maintain a staff of sufficient size to meet the average demands made upon the division and then employ them during such time as is not demanded by the routine work in the preparation of supplies for use during the rush periods and in the study of the special problems which are continually arising in the course of the routine work. Without such investigations of special problems no public health laboratory can keep its work up to the point of highest efficiency or retain the best workers for any length of time. Under the present conditions it is a physical impossibility to attempt any such work because of inadequate quarters and insufficient funds.

WORKING CONDITIONS

The Bacteriological and Serological Divisions are both quartered in room 305 Medical Laboratory Building. The routine examinations of both divisions, the preparation of media, washing, preparation and sterilization of glassware and the making up and shipment of outfits is all done in this one room under such crowded conditions as to make it difficult for one person to pass another. With so many persons doing such varied work there is of necessity sufficient confusion to lower the efficiency of the work done by all. Such conditions also increase the possibility of contamination of any bacteriological work which may be in progress.

From the standpoint of economy, the greatest handicap which the laboratories have to deal with is the lack of sufficient storage space.

Many items on the supply list could be bought at a much better figure if storage space were available for the accommodation of a year's supply. With additional space it would also be possible to make up large numbers of laboratory specimen outfits (particularly diphtheria outfits) during the summer months when the work is light and thus avoid the necessity of employing additional help during the fall rush.

In place of the one overcrowded and ill ventilated room which the two divisions now occupy, there should be separate laboratories for the serological and bacteriological work, a media and sterilizing room, a room for the cleaning and preparation of glassware, a reagent stock room, a large room for the making, storage and shipment of outfits and supplies and additional office room.

RELATIONSHIP TO LOCAL LABORATORIES

According to the rules and regulations of the State Board of Health, examinations in connection with the control of communicable diseases must be done by the laboratories for the State Board of Health or by approved laboratories in order to be official. There are a number of commercial and hospital laboratories in the state which have not been approved and which are making examinations in connection with the control of communicable diseases, many of them without adequate equipment and with a personnel whose training is deficient. The laboratories for the State Board of Health should be given the authority to control this situation as has been done in other states where public health work has shown the greatest advances. This authority should embrace the following points:

1. No laboratory should be permitted to receive a specimen for examination in connection with the control of communicable diseases without first having been licensed by the laboratories for the State Board of Health, after the director of these laboratories has satisfied himself that the equipment of the laboratory and the training of the workers is such as to insure reliable work.

2. Licensed laboratories should be required to use standard laboratory technique which has been approved by the laboratories for the State Board of Health. The efficiency of the various laboratories should also be checked from time to time by having them examine specimens which have been submitted by the laboratories for the State Board of Health.

3. The staff and equipment of the laboratories for the State Board of Health should be sufficient to permit of a certain amount of investigational work on the latest laboratory methods in order to insure the use of the most efficient technique.

LABORATORY SPECIMEN OUTFITS

During the biennium, the Bacteriological Division has distributed 107,232 laboratory specimen outfits, an increase of 55,667 over the number distributed during the previous biennium.

The only material change which has been made in the laboratory specimen outfits during the biennium has been in the type of information card sent out with the outfits. With the enormous increase in the quantity of work, the old system of recording and reporting specimens which had been in use for a number of years was found to be cumbersome and to require an unnecessarily large amount of clerical work. A form was therefore devised which not only functions as an information blank but also serves as a report on the examination. The following form is representative of the cards now employed:

LABORATORIES FOR THE STATE BOARD OF HEALTH,
IOWA CITY, IOWA.

Tubercle Bacilli FOUND	Tubercle Bacilli NOT FOUND	Second Specimen Requested.

Day No.....Date received.....

Serial No.....Date reported.....

Physician must fill out below this line.

Patient's name.....

Telegraphic report at physician's expense?.....Yes ☐ No ☐

(An answer to this question changes the postage rate from fourth to first class.)

DR.

.....

Doctor's Name.

IOWA.

.....

Address.

YOUR REPORT IS INDICATED BY CHECK MARK.

(Use reverse side of card for "Provisional diagnosis," "Remarks," etc.)
Form 5

The various reports are printed near the top of the card and the report which it is desired to give is indicated by a check mark. The space for the physician's name and address is so arranged as to fit the opening in the standard window envelope which is obtained from the U. S. Postal Department, thus the physician addresses his own report. In addition to the time and work saved in getting out reports with this system it has also relieved the laboratories of a certain amount of criticism because of the inability to send out reports when the physician's name and address are illegibly written. Under this system the physician has no one but himself to blame if the address is illegible to the postal clerks.

It seemed advisable during the latter part of this biennium to begin the distribution of two new specimen outfits, namely; a blood culture outfit and a miscellaneous specimen outfit. The blood culture outfit is intended primarily as an aid to the early diagnosis of typhoid fever since positive blood cultures are obtained in more than 90 per cent of the cases during the first week of the disease. The Widal test, which is commonly used, gives positive results in about 20 per cent of the cases during the first week of the disease and does not reach its greatest degree of reliability until the third week of the disease.

In devising a blood culture outfit, several factors had to be considered. First, simplicity; second, ease of contamination during collection of the specimen; and third, ability to withstand rough handling during shipment. After considerable experimental work an outfit was decided upon which consists of a heavy walled glass bottle, half filled with liquid culture medium and closed with a soft rubber stopper. This bottle is packed in a substantial wooden box for express shipment, since the postal laws and regulations forbid the shipment of liquid cultures by mail. In using this outfit, the physician obtains the blood from a suitable vein by means of a sterile needle and syringe, paints the surface of the rubber stopper with tincture of iodine, plunges the needle through the stopper and discharges the blood into the liquid medium in the bottle.

The miscellaneous outfit consists of a sterile tube and swabs, enclosed in the usual double mailing tube required by the postal laws and regulations.

As the demand for these outfits has not as yet warranted our stocking them at stations where the other laboratory specimen outfits are kept, they are sent direct to the physician upon request.

LOSS OF OUTFITS

Considerable attention has been given to an attempt to reduce the number of outfits which are not returned to the laboratories. Many hospital laboratories, branch laboratories, health officers and others use these outfits and make the examinations themselves. The used outfits, being of no further use to them, are frequently thrown away. This practice results in a large loss to the laboratories as the outfits cost approximately 30 cents each and the parts can be used over and over again if returned to the laboratories. A list was recently compiled of all persons and institutions which might be using our outfits and communications addressed to them in regard to the matter. This has resulted in the return of several thousand outfits which would have otherwise been lost.

MISUSE OF OUTFITS

There has been a material reduction in the misuse of outfits during this biennium. Many people have used the mailing tube of the outfit for the shipment of small articles, the portions of the outfit which they did not need being thrown away. When attention has been called to the fact that such a procedure constitutes a misuse of state property, the majority of these offenders have discontinued the practice at once.

DIPHTHERIA EXAMINATIONS

During the past biennium a total of 49,040 diphtheria examinations were made. Of these, 15,711 were for diagnosis, 15,053 were for release from quarantine, 18,258 for the detection of carriers and 17 were for virulence tests.

The greatest increase in diphtheria examinations has been in connection with diphtheria carrier detection in schools and other institutions. During the fiscal year 1920-21, 4,626 carrier examinations were made and

in the fiscal year of 1921-22, 13,633 carrier examinations were made. The increased use of the laboratories in the detection of carriers has been largely due to the emphasis placed on this work by this division and the Division of Epidemiology. While the carrier survey in schools and institutions is a poor substitute for immunological methods for the detection and protection of susceptible persons, it has considerable value in the control of an epidemic. Such surveys are also of considerable value in bringing before the general public information regarding the mode of transmission of the disease and undoubtedly will play a part in hastening the more general adoption of the more efficient methods of control.

The virulence test should be used much more extensively than it is at present but with the time and room available it has not been possible to give it much attention. In making the test two guinea pigs, one of which has been protected by antitoxin, are inoculated with the culture to be tested. If the organism is virulent the pig which has not been protected by antitoxin will show characteristic lesions which will be lacking in the pig which was protected by antitoxin. For the protection of the general public, it is, of course, imperative that every person harboring diphtheria bacilli be considered a carrier of virulent organisms until proven otherwise. It, therefore, follows that it is only justice to the person involved to determine whether the organism which he is harboring is virulent or not. A considerable number will be found to be nonvirulent and as such cases are not a menace to others they need not be isolated.

Detailed information regarding the diphtheria examinations done will be found in the following table:

TABLE 1.—SPECIMENS RECEIVED FOR THE EXAMINATION OF DIPHTHERIA

	Positive	Negative	Diagnosis reserved	Specimens unsuitable for Exam.	Total
Diagnosis—					
1920-1921	876	6,824	142	17	7,859
1921-1922	2,181	4,960	695	16	7,852
Total	3,057	11,784	837	33	15,711
Release					
1920-1921	1,468	3,423	70	10	4,971
1921-1922	3,380	6,233	455	14	10,082
Total	4,848	9,656	525	24	15,053
Carrier—					
1920-1921	324	4,177	124	1	4,626
1921-1922	934	12,244	419	36	13,633
Total	1,258	16,421	543	37	18,259
Virulence Tests—					
1920-1921	4	11	1	0	16
1921-1922	1	0	0	0	1
Total	5	11	1	0	17
Totals	9,168	37,872	1,906	94	49,040

Grand total for the biennial period, 49,040.

TYPHOID AND PARATYPHOID FEVER

During the biennium 3,125 specimens of blood were subjected to the Widal test, 185 specimens of excreta were examined for the presence of the typhoid bacillus together with ten blood cultures and two milk specimens.

The employment of the excreta examination to determine whether or not a person who has recovered from typhoid fever is capable of transmitting the disease to others is not being used as much as is to be expected. According to the regulations of the State Board of Health all food handlers who have had typhoid fever must have negative excreta examinations before resuming their duties. From the number of excreta examinations called for it is quite evident that the majority of the physicians are ignoring this regulation. It is quite probable, however, that if this regulation were more generally observed the Division of Bacteriology could not handle the volume of work which it would be called upon to do, while handicapped with its present inadequate quarters and small personnel.

As mentioned under the heading of outfits, a blood culture outfit, intended primarily as an aid in the diagnosis of typhoid fever, has been added to the list of specimen outfits furnished by the division. The blood culture examination should supplant the Widal test because of the fact that it is of so much more value during the early stages of the disease and also will frequently furnish valuable information in infections other than typhoid.

The following table gives detailed information regarding the typhoid examinations made during the biennium:

TABLE 2.—SPECIMENS RECEIVED FOR THE EXAMINATION OF TYPHOID FEVER

	Positive	Negative	Weak reaction	Specimens unsuitable for Exam.	Total
Widal—					
1920-1921	318	911	131	4	1,364
1921-1922	482	1,157	110	1	1,761
Cultural examination—Feces and urine—					
1920-1921	1	108	2	0	111
1921-1922	5	62	3	4	74
Cultural examination—Milk—					
1920-1921	0	2	0	0	2
1921-1922	0	0	0	0	0
Cultural examination—Blood—					
1920-1921	0	4	0	0	4
1921-1922	0	6	0	0	6
Totals	817	2,250	246	9	3,322

Grand total for the biennial period, 3,332.

TUBERCULOSIS EXAMINATIONS

The majority of the tuberculosis examinations consist of the examination of sputum for the presence of the tubercle bacillus. A specimen of spinal fluid, pus or excretion is occasionally received for examination.

During the biennium 8,114 specimens were examined for the presence of the tubercle bacillus and the organism was found in 1,075 of these specimens.

The following table gives a detailed information regarding these examinations:

TABLE 3.—SPECIMENS RECEIVED FOR THE EXAMINATION OF TUBERCULOSIS

	Positive	Negative	Diagnosis reserved	Specimens unsuitable for Exam.	Total
Sputum—					
1920-1921	494	3,321	12	59	3,886
1921-1922	576	3,508	12	75	4,171
Total	1,070	6,829	24	134	8,057
Feces and urine—					
1920-1921	0	13	0	0	13
1921-1922	0	10	0	0	10
Total	0	23	0	0	23
Milk—					
1920-1921	0	1	0	0	1
1921-1922	0	0	0	0	0
Total	0	1	0	0	1
Pus—					
1920-1921	4	12	1	0	17
1921-1922	0	10	0	0	10
Total	4	22	1	0	27
Spinal Fluid—					
1920-1921	1	3	0	0	4
1921-1922	0	2	0	0	2
Total	1	5	0	0	6
Totals	1,075	6,880	25	134	8,114

Grand total for the biennial period, 8,114.

RABIES EXAMINATION

There has been a marked increase in the number of rabies specimens examined during this biennium. One hundred eleven specimens were examined, of which 50 were positive.

Many specimens are received in such an advanced stage of decomposition that it is impossible to make a satisfactory examination. Because of this fact 9 specimens were rejected as totally unfit for examination. It was also necessary to report 26 specimens as showing bodies similar to Negri bodies but not definitely positive. The majority of these indefinite reports were either due to the advanced degree of decomposition of the specimen or to the destruction of a large portion of the brain tissue in killing the animal or both.

Every available means of obtaining publicity has been employed in disseminating information as to the proper methods of handling suspected cases of rabies in animals and proper methods of packing and shipping specimens. Considerable improvement has been noted in the condition of specimens received but there are still entirely too many specimens received in bad condition. The traffic regulations of the American Express Company covering the shipment and packing of rabies specimens give excellent instructions for the packing of heads and we rarely if ever receive a satisfactory specimen which does not comply with these regulations. Unfortunately the average express agent receives so few rabies specimens for shipment that he is not familiar with the regulations and will allow most any sort of a package to go through. The state officials of the American Express Company have shown a willingness to cooperate and an arrangement has been made whereby all improperly packed specimens are reported to these officials who in turn bring the matter to the attention of the agent responsible for the receipt of the specimen. This procedure has been of considerable value in improving the general condition of the specimens received.

The following table gives detailed information regarding the rabies examinations made during the biennium:

TABLE 4.—SPECIMENS RECEIVED FOR THE EXAMINATION OF RABIES

	Positive	Negative	Diagnosis reserved	Specimens unsuitable for Exam.	Total
Dog Head—					
1920-1921	19	9	9	7	44
1921-1922	19	9	12	2	42
Total	38	18	21	9	86
Live Dog—					
1920-1921	0	1	0	0	1
Live Ferret—					
1921-1922	0	1	0	0	1
Total	0	2	0	0	2
Heads of Cat, Hog, Calf, Squirrel, etc.—					
1920-1921	1	0	0	0	1
1921-1922	11	6	5	0	22
Total	50	26	26	9	111

Grand total for the biennial period, 111.

EPIDEMIC CEREBRO-SPINAL MENINGITIS

A laboratory examination for the presence of the meningococcus, when conducted at a distance from the patient, probably presents as many difficulties as any test which the laboratories are called upon to do. The meningococcus is an extremely delicate organism and dies out in a few hours if the temperature is lowered below that of the body. It is also easily autolyized and digested by the leucocytes. In consequence, a specimen which has been packed in the manner employed for other examinations will usually give negative results both culturally and microscopically, even though it were loaded with organisms when drawn. Another difficulty in making reliable reports is due to the fact that if the specimen of spinal fluid is contaminated in collection the contaminating organism will overgrow the meningococcus and it will be impossible to make an isolation. The majority of spinal fluid specimens which we receive for this examination are contaminated with air forms such as B. subtilis.

Special instructions have been issued for the preparation and shipment of meningococcus specimens. A great deal of publicity is needed on this subject and the quarantine regulations should be modified to take into consideration the difficulties encountered in the laboratory examination.

The following report gives detailed information regarding the meningococcus examinations made during the past biennium:

TABLE 5.—SPECIMENS RECEIVED FOR MENINGITIS

	Positive	Negative	Diagnosis reserved	Specimens unsuitable for Exam.	Total
Spinal Fluid—					
1920-1921	5	6	1	0	12
1921-1922	0	14	0	0	14
Total	5	20	1	0	26
Cultures—					
1920-1921	0	0	0	0	0
1921-1922	0	29	0	3	32
Total	5	49	1	3	58

Grand total for the biennial period, 58.

MALARIA EXAMINATIONS

Six malaria examinations were made during the biennium, as shown in the following table:

TABLE 6.—SPECIMENS RECEIVED FOR MALARIA

SPECIMENS RECEIVED FOR EXAMINATION OF MISCELLANEOUS MATERIAL

	Positive	Negative	Diagnosis reserved	Rejected	Total
Smears—					
1920-1921	1	4	0	1	6
1921-1922	0	0	0	0	0
Total	1	4	0	1	6

SPECIMENS RECEIVED FOR EXAMINATION OF MISCELLANEOUS MATERIAL

1920-1921	22	45	0	4	71
1921-1922	44	41	0	0	85
Total	67	90	0	5	162

Grand total for biennial period, 162.

MISCELLANEOUS EXAMINATIONS

One hundred and sixty-two miscellaneous examinations were made during the biennium. There is a growing demand for such examinations which should be encouraged. As mentioned elsewhere in this report, it is a difficult matter to give these examinations the attention which they deserve because of lack of space, equipment and personnel. Such examinations demand much in the way of special preparations and time, one such examination frequently requiring as much time as is consumed in the examination of five hundred diphtheria cultures.

RECOMMENDATIONS

1. A sufficient staff should be authorized to handle all ordinary demands which are made upon the laboratory in the shortest time possible. Such force to be employed during times when the work is light in the preparation of supplies for the rush seasons and in investigational work in connection with the problems that are continually arising in the routine work of the laboratory. Unless some time is given for investigational work it is impossible to keep competent technical workers for any length of time.

2. That instead of the one overcrowded and ill ventilated room which the Divisions of Bacteriology and Serology now occupy, the following quarters be provided:

A. Bacteriological laboratory.
B. Serological laboratory.
C. Washing and sterilizing room for glassware.
D. Media kitchen.
E. Stock room for chemicals and small supplies.
F. General supply and storage room.
G. Outfit and shipping room.
H. Offices for the technical staff.

3. That authority be granted which will make possible the enforcement of minimum requirements on the laboratories throughout the state which are doing work in connection with the control of communicable diseases.

TABLE 10.—OUTFITS DISTRIBUTED

	Blood	Diphtheria	Typhoid	Tuberculosis	Wassermann	Gonorrhea	Total
1920-1921	0	22,779	1,442	7,653	15,804	1,738	49,216
1921-1922	4	64,470	2,153	8,731	25,007	2,972	103,337
Total	4	87,249	3,595	16,384	40,811	4,710	152,553

II. SEROLOGICAL DIVISION

Miss Zelma Zentmire, Chief

This divisions is the outgrowth of grants made by the U. S. government during the world war for the control of venereal disease. In addition to Wassermann tests the division also makes examinations of chancre juice for Treponema pallida and of discharges for the presence of the gonococcus.

WASSERMANN TESTS

Outfits

The Wassermann specimen outfit which is furnished by the division consists of a sterile glass tube, closed with a cork stopper, and containing a needle for the collection of blood, and an information blank. These articles are enclosed in the regulation double mailing tube required by the U. S. postal laws and regulations.

With the tremendous increase in the volume of work, this division also found the old system of recording and reporting specimens to be cumbersome and to require an unnecessary amount of clerical work. Information cards, similar in type to those adopted by the Division of Bacteriology have been adopted. The blank serves the double purpose of an information and report blank, the physician addressing his own report. The material on the card is as follows:

LABORATORIES FOR THE STATE BOARD OF HEALTH.
THE UNITED STATES PUBLIC HEALTH SERVICE.
BUREAU OF VENEREAL DISEASE CONTROL.

Medical Laboratory Building

Iowa City, Iowa.

Day No.....

WASSERMANN TEST Date rec,d.....

Patients' name..... Date reported.....

Specimen of blood ☐ Spinal fluid ☐ Check which.

Telegraphic report at physician's expence?.....yes ☐

(An answer to this question changes the postage rate from fourth to first class)

Dr. .....

.....

.....IOWA

Report is indicated by check mark. Fill out card legibly to insure prompt report.

The result of the Wassermann test upon the above specimen, using plain alcoholic and cholesterinized antigens is as follows:

EXPLANATION OF READING OF TUBES.

Alcoholic	Cholesterinized		Blood submitted combines with syphilitic antigen	Blood submitted combines with the red blood cells of the test
		—Absence of reaction	0%	100%
		+ Very slight reaction	Less than 25%	More than 27%
		1+Slight reation	25%	75%
		2+ Weak reaction	50%	50%
		3+ Moderate reaction	75%	25%
		4+ Strong reaction	100%	0%

Specimen unsatisfactory. Another specimen requested because of:—

Hemolysis Breakage in transit
Turbidity Insufficient serum

Remarks.....

.....

The reverse side of the card carries the following instructions and interpretation of reports:

INTERPRETATION OF LABORATORY REPORTS

General Considerations.

All persons giving positive tests should be reported immediately on proper forms supplied by the township or county clerk as provided by the state law.

If the result of this test is not such as might have been expected, examination of repeated specimens is advised. Negative tests do not necessarily mean the absence of syphilis. Negative laboratory tests of any kind have less significance than positive reports. The results of any complement fixation test should always be interpreted in the light of clinical evidence. Final diagnosis should always be based upon the history, clinical findings and serologic examination.

The Wasserman test seriously interfered with if the patient has malaria, yaws or leprosy or if alcohol, ether, chloroform, arsenic or mercury has been administered in the twenty-four hours preceding the taking of the specimen.

The plain alcoholic antigen is the less sensitive indicator and is used chiefly as a guide in diagnosing untreated cases. The cholesterinized antigen is a more sensitive indicator and is chiefly valuable in following the effect of treatment.

DIRECTIONS FOR COLLECTING BLOOD

Specimens should be collected with aseptic technique as contaminated specimens give misleading results. Draw the tube three-fourths full of

blood and slant at room temperature while clotting takes place, then mail specimen to the laboratory. Fill out data blank as indicated.

Wassermann Tests Made

During the biennium 44,324 Wassermann tests were made on specimens of blood and spinal fluid, an increase of 27,699 over the number in the previous biennium. The table at the end of the report for this division gives detailed information regarding these tests.

GONORRHEA EXAMINATIONS

Outfits

The gonorrhea specimen outfit consists of two microscopic object slides, enclosed in a protective wooden case, and an information blank, which are enclosed in a heavy manilla envelope for mailing. The information blank has been changed during the biennium to correspond to the general system of recording and reporting specimens which has been adopted. The report blank is as follows:

LABORATORIES FOR THE STATE BOARD OF HEALTH
THE UNITED STATES PUBLIC HEALTH SERVICE
BUREAU OF VENEREAL DISEASE CONTROL

MEDICAL LABORATORY BUILDING

IOWA CITY, IOWA

Remarks .....

.....

.....

Gonococci FOUND	Gonococci NOT FOUND	Pus, Mucous shreds, Extra-cellular diplococci WERE FOUND	Day No..... Serial No..... Date Rec'd..... Date Reported.....

Patient's name .....

Smear submitted for Diagnosis ☐ Release ☐ Check which.

Telegraphic report at physician's expense?..... YES ☐ ☐

(An answer to this question changes the postage rate on the specimen from fourth to first class)

Dr. .....

Doctor's Name

.....

Address

Report is indicated by check mark. This card must be filled out in ink to insure prompt report.

The reverse side of the card carries the following instructions for collecting specimens and interpreting reports:

DIRECTIONS FOR COLLECTING AND SPREADING DISCHARGE FROM ACUTE OR ACTIVE CASES OF GONORRHEA

These slides were clean when they left the laboratories. Handle by edges to get best results. Collect a drop of the FRESH URETHRAL DISCHARGE near one end of a slide and make a smear of uniform thickness covering about ¾ of the width and ¾ of the length of the slide. Allow this to dry in the air without touching anything. Prepare second slide in the same way. When dry place the slides back to back in the wooden mailing case and secure with rubber band or string.

IN CASES WHERE THERE IS NO EVIDENCE OF DISCHARGE

In the MALE the prostate should be carefully massaged and the specimen obtained by compressing the urethra and stripping toward the meatus. Collect a drop of the FRESH EXUDATE thus obtained near the end of the slide and smear as directed above.

In the FEMALE, specimens should be taken by compressing the urethra with the finger and stripping toward the meatus. Specimens of FRESH EXUDATE should also be taken from the cervix uteri, after careful cleansing of the os, and from Bartholin's glands if these are infected. Vaginal smears are usually of little diagnostic value.

INTERPRETATION OF REPORTS

Slides examined for gonococci will be reported in the following ways:

I. GONOCOCCI FOUND. This means that intracellular Gram negative diplococci of the size, shape, and staining characteristics of the gonococcus WERE FOUND in the smear. Although it is impossible, without cultural and serological tests, to take an oath that these organisms are gonococci, if the material was obtained under circumstances where the gonococcus is suspected, the likelihood of there not being gonococci is very slight.

II. GONOCOCCI NOT FOUND. This means that NO ORGANISMS as described above WERE FOUND. This does not exclude the possibility of gonococcus infection, it only means that no gonococci were found in the specimen submitted.

III. PUS, MUCOUS SHREDS, EXTRACELLULAR DIPLOCOCCI WERE FOUND. These findings may be the result of vigorous treatment.

Gonorrhea Examinations Made.

During the biennium 3,354 examinations were made for the presence of the gonococcus, an increase of 870 over the number run during the previous biennium. The following table gives detailed information regarding these examinations:

RECOMMENDATION

1. *Time of tests.*

Wassermann tests are run on Tuesday and Friday at the present time, this being as often as it is possible to run them with the facilities available. With only two runs a week the physicians do not get as prompt returns as they should receive. Facilities should, therefore, be provided which would enable the division to run the Wassermann test at least three times each week.

2. *Tests for syphilis.*

Requests are frequently received for the Lange colloidal gold test and other examinations which are an aid in the diagnosis of syphilis. The present staff and quarters make it impossible to handle such work. Additional quarters, staff and equipment should be provided to enable the division to handle this work.

3. *Investigational work.*

Probably no diagnostic laboratory procedure is being subjected to as much study at the present time as the Wassermann test. In consequence new methods are being evolved quite rapidly. Many of these are no better than those in use at the present time. That some of these are an improvement over the old methods goes without saying. The technical staff should therefore be increased to the point where a certain amount of time would be available for testing out the newer procedures in order to determine which are applicable to a state public health laboratory.

TABLE 7.—SPECIMENS RECEIVED FOR WASSERMANN TEST

	1920-21	1921-22	Total
Blood—			
Cholest. Antig. Positive Alch. Antig. Positive	2,841	2,963	5,804
Cholest. Antig. Negative Alch. Antig. Negative	13,289	18,289	31,578
Incomplete Hemolysis	707	421	1,128
Cholest. Antig. Positive Alch. Antig. Negative	230	684	914
Cholest. Antig. Positive Alch. Antig. Doubtful	247	1,233	1,480
Cholest. Antigen Doubtful Alch. Antigen Negative	155	400	555
Cholest. Antigen Doubtful Alch. Antigen Positive	1	0	1
Specimens unsuitable for examination	756	220	976
Anticomplementary	179	15	194
Doubtful Doubtful		97	97
Spinal Fluid—			
Cholest. Antig. Positive Alch. Antig. Positive	105	262	367
Cholest. Antigen Negative Alch. Antigen Negative	228	837	1,065
Doubtful		25	25
Incomplete Hemolysis	9		9
Anticomplementary	7	11	18
Specimens unsuitable for examination	5	8	13
Gonorrhea—			
Positive	361	395	756
Negative	363	913	1,276
Doubtful	401	880	1,281
Specimens unsuitable	20	21	41
Total	19,904	27,744	47,678

Grand total: 1920-21, 1921-22, 47,678.

III. 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 laboratory building of the State University of Iowa. Like the other divisions of the state board of health laboratories, it is under the direction of Dr. Don M. Griswold. The work of the division is in charge of Mr. Jack J. Hinman, Jr., assisted since October, 1921, by Mr. Martin E. Flentje, water analyst. Miss Grace Hornung, Miss Irene Hogan and Mr. Hubert J. Evers have been employed as laboratory assistants at different times during the biennium.

The water laboratory was opened in February, 1914, in accordance with an act of the thirty-fifth general assembly which appropriated $5,000 to the State University of Iowa for an "epidemiologist and laboratory." A reorganization of the work was effected by the thirty-sixth general assembly. Prior to the reorganization, the analyses of water were done gratuitously, but since May, 1915, a fee has been charged as directed by the act of the thirty-sixth general assembly which ordered that a fee, not to exceed two dollars per sample, be imposed. This fee was afterward fixed at one dollar per sample except in certain special cases where large numbers of samples were to be examined from a community. In such cases a reduction of the fee was authorized by regulation.

The numbers of samples analyzed in the water laboratory has been as follows:

February 16, 1914, to July 1, 1915	1,366
July 1, 1915, to July 1, 1916	1,122
July 1, 1916, to July 1, 1917	2,012
July 1, 1917, to July 1, 1918	1,955
July 1, 1918, to July 1, 1919	1,888
July 1, 1919, to July 1, 1920	2,103
July 1, 1920, to July 1, 1921	2,672
July 1, 1921, to July 1, 1922	3,692

The greatly increased use of the water laboratory during the biennium 1920-22 is due to greater familiarity on the part of city officials and physicians with the work of the water laboratory, and with the service which is offered to them by the state. Many communities are not yet taking full advantage of the opportunity to know the condition of their water supplies by means of frequent examinations.

Experience has shown the need of such examinations, even in the case of deep wells which have been noted for purity and constancy. An example of this need is well shown in the case of the city of Waterloo where the city water officials have kept a close watch upon the water supplied to the public. The wells are in the neighborhood of 1,400 feet in depth and are cased for 800 feet of this depth. The water obtained from the wells is of high bacterial purity. Twice since the opening of the laboratory, however, the casing of one of the three wells has rusted through, and in both cases the admission of unsatisfactory material was first shown by bacteriological examination. Lack of periodic examinations might have resulted in an epidemic due to the unsafe character of the water entering through the openings, but the knowledge of the situation by the city authorities enabled them to take prompt action for the protection of the public.

Waterloo's case is not unique. There are other communities in the state where the well water has a decided action on iron piping. In addition to the action on the metal of the casing, deep wells have other troubles. Perhaps the casing is not long enough; perhaps it is not set in a proper manner; perhaps the well penetrates a passage in the rock through which water, contaminated either continuously or at intervals, passes without the filtration which passage through the earth usually

affords. This danger from water in the solution passages is more pronounced in some parts of the state than in others. Some of the rock formations are much more soluble than others and there may be direct connection between the water bearing crevice and sink holes, cesspools, abandoned wells used as cesspools, or privy vaults.

While the deep well is not free from its dangers, the shallow well is usually even more exposed to contamination. From its depth, it must of necessity derive its water from close to the surface of the ground. Most of the trouble with shallow wells comes from the entrance of surface water carrying with it material of a sewage-like nature. This surface water usually gets into the well through the top of the casing or the platform covering it. If the top of the well and the upper ten or twelve feet of the casing could be kept watertight, most of the difficulty with the ordinary shallow wells would be avoided.

In a good many of the Iowa communities which depend upon the water of shallow wells for their public supplies, the site of the wells is not such as to give the wells adequate protection. Private shallow wells are even more frequently open to this objection. Shallow wells are very apt to be influenced by weather conditions. Some go dry at times when the rainfall is light and some receive drainage at times of wet weather. In periods when rain is scarce and water is low, small animals in search of water fall into wells where the casing is not tight.

Where the water supply is known to be unsafe as it is obtained, as in the case of river waters, pond waters, infiltration galleries waters, and water from contaminated or dangerous wells, some form of purification must be employed.

If the water to be purified is clear and practically colorless, the water may be treated with calcium hypochlorite or liquid chlorine for the purpose of destroying the bacteria which are harmful, and reducing the numbers of the harmless organisms. If the water is turbid due to the load of mud or silt that the water carries, such simple treatment as chlorination will not be ample. The water must be treated with coagulant, such as aluminum sulphate or iron sulphate and lime, settled, and filtered, before chlorination. In most cases the filtration will reduce the numbers of the bacteria, as well as effect an almost complete removal of suspended matter. In all cases however, the use of some germicide, such as calcium hypochlorite or chlorine is advisable, if for no other reason than that it provides a secondary line of defense.

In either case the operation of the purification equipment must be checked at frequent intervals if the water is to be used with safety and confidence by the people of the community. The frequency of the examination should be determined in all cases on the basis of a knowledge of the character of water to be treated, the defects of the plant, and an appreciation of its operation in the past. Sudden and unusual loads on the plant frequently result from rapid rises of streams after local rains. Summer dry weather and the break-up of the ice may both bring difficulty to the water works operator.

For best results water purification plants should be checked daily to assure adequate treatment. Unfortunately this frequent testing is beyond

the means and equipment of the smaller plants. A few of the plants in the larger cities, such as Cedar Rapids, Council Bluffs, Davenport, and Des Moines, have laboratories where daily tests upon the raw and treated waters are made. Some, such as Keokuk and Waterloo, make examinations at the plant two or three times a week. In some cities, such as Mason City, Oskaloosa, Dubuque, and Sioux City, examinations are made at intervals by the city bacteriologist or chemist employed through the local board of health.

The smaller purification plants should take advantage of the service they may obtain from the water laboratory. Many of them now do so. The community first to take advantage of this service was Burlington. Two or three samples of Burlington's water are examined every week in order to check the performance of the plant.

The necessity for such control of operation is realized when it is remembered that unsafe water is sometimes not visibly different from water which is perfectly satisfactory. Much of the unsafe filtered water can be characterized by turbidity or color, but the turbid or colored water which passes the filter is not always actually unsafe.

The old regulations of the state board of health required that a sample of water from each public supply should be examined by the water laboratory at least semi-annually. Experience showed that in the case of shallow wells and purified waters this frequency was not sufficient for the proper protection of the public, and a new set of regulations was adopted, at the suggestion of the laboratory staff. A copy of the resolution passed by the board is as follows:

Whereas, The need of a closer supervision of the public water supplies of the state has become imperative in order properly to safeguard the health and lives of the people, and

Whereas, Water supplies from sources of different types are subject to different chances of contamination and require inspection varying in intensity,

Therefore, Be It Resolved, by the Iowa State Board of Health, that the Local Boards of Health of the state shall require analyses of the water furnished by the public water supplies of their several jurisdictions in accordance with the following schedule:

Systems 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.

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.

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 herein shall be made by Water Laboratory Division of the Laboratories for the State Board of Health or other authorized laboratories which shall report the results thereof to the said Water Laboratory Division and all analyses shall be performed under the Rules and Regulations issued by the Director of the Laboratories for the State Board of Health.

In the case of plants treating water known to be impure it is desirable that close check be kept upon the operation of the apparatus in order that the operator may be assisted in finding the sources of such difficulties of operation as may occur from time to time. In connection with

occasional unsatisfactory operation, it is frequently possible to suggest possible remedies from the laboratory if details of the operation are known in addition to the laboratory findings on the samples of water submitted for analysis. The file of reports enables some deductions to be made as to the probable success of operation from time to time and in case of an epidemic of intestinal disease and an epidemiological investigation to determine the source of the trouble, the laboratory findings and the record would offer very satisfactory evidence as to whether the local water plant was entitled to a clean bill of health or was a likely cause of disease among the citizens. A certain part of the laboratory examinations upon the public water supplies are made by the plant laboratories, or by private laboratories, some of which are authorized branch laboratories of the state board of health. In order to keep in touch with the results of these examinations for the benefit of the public health, the board constituted all the plant laboratories in Iowa authorized branch laboratories in so far as work upon their own water supplies was concerned. These laboratories are required to use approved laboratory methods and media and are required to make reports to the water laboratory division at weekly intervals as are the plant operators.

The resolution of the state board of health covering these reports is as follows:

Whereas, The need of adequate supervision of the water purification plants of the State of Iowa is essential in order that they may properly safeguard the quality of the water supplied to the public throughout the year, and

Whereas, The quality of the raw water of surface supplies, treated by purification plants, is subject to sudden and important changes according to the weather conditions, which fluctuation necessitates corresponding changes in the treatment applied to the water and in the amounts of chemicals added, and

Whereas, The Water Laboratory Division of the Laboratories for the State Board of Health at Iowa City can assist more effectively in the purification of these waters, if sufficient information is available concerning the operation of the various plants over a period of time,

Therefore, Be It Resolved, By the Iowa State Board of Health that the Local Boards of Health shall require the water purification plants within their jurisdiction to furnish to the Water Laboratory Division of the Laboratories for the State Board of Health, Iowa City, at weekly intervals, on forms furnished by the State Board of Health, a statement concerning the amounts of chemicals used, the amounts of water pumped, the weather conditions and the results of such bacteriological examinations as may have been made upon the city water at local laboratories, together with such other information as may be requested by the said Laboratory Division and that the said Water Laboratory Division shall endeavor in every way possible to assist the water purification plants in the solution of their difficulties of operation and shall make such examinations of waters as shall be desired by such plants under the provision imposed by law.

To assist in the reporting required by the above resolution the board has provided blanks suitable for reporting upon the operation of the plant, and also blanks for reporting upon the laboratory control. The detail on these blanks was kept at a minimum in order to avoid any unnecessary work on the part of those reporting. Copies of the forms will be sent upon application to the secretary of the State Board of Health.

It is believed that the making of these reports in some of the smaller places will also have a definite educational value, as in such plants it is common to find that no records are kept, or that such records as may be kept are kept in a very fragmentary manner.

Care is taken upon the receipt of the reports to go over them individually, noting any unusual features, and possibility of trouble. The reports are then filed consecutively. A check is kept to see that the reports are received and each report is acknowledged. The acknowledgment card is an indication to the operator or laboratory worker that his report has been looked over and checked in. When necessary letters are sent out urging more prompt compliance with the regulations of the board. In general however, this service seems to be much appreciated by the water works operators when once the purpose is understood, and reporting is actually commenced. The acknowledgment card is as follows:

THE STATE UNIVERSITY OF IOWA

LABORATORIES FOR THE IOWA STATE BOARD OF HEALTH

Water Laboratory Division
219 Medical Laboratory Bldg.,
Iowa City

Your report upon the.....
of the Public Water Supply of.....
for the week ending.....
has been received at this office.....
Remarks will be found on the reverse of this card.

.....
.....

IOWA

REMARKS:

.....
.....
.....
.....
.....
.....
.....
.....

It is suggested that this card be filed for purpose of record.

.....
Chief, Water Laboratory Division.

The need for this close supervision of water purification plants will be more fully realized when it is known how frequently they fail to produce satisfactory water, even when operated by men who are well qualified to handle them and who are endeavoring to produce a safe water at all times. In our examination of water from the purification plants of Iowa where water is coagulated, settled and in most cases filtered and chlorinated, we have but two plants which have failed to give us at least one unsatisfactory report. The failure in these two cases is not due to the fact that they are unusually efficient plants, for as a matter of fact they are two of the least satisfactory of the plants in the list. The trouble is due to too few analyses having been made for the

report to be representative of the operation of the plant. It must be granted, too, that many of the samples which were sent in were sent at times of difficulty which the operator recognized and that the samples were sent in so that he might have suggestions and know just how bad a water he was supplying to his community. In the following table the situation is summarized:

City	No. Samples	No. Unsatisfactory	Date Last Analysis
Bedford	8	5	Mar. 8, 1922
Burlington	687	31	June 7, 1922
Cedar Rapids	29	8	May 18, 1922
Centerville	69	10	June 14, 1922
Chariton	22	9	June 20, 1922
Clarinda	6	3	June 15, 1922
Clear Lake	2	2	June 23, 1921
Corning	4	3	June 9, 1922
Corydon	4	2	Feb. 7, 1922
Council Bluffs	8	1	June 9, 1922
Creston	36	5	May 26, 1922
Davenport	40	6	Nov. 28, 1921
Fairfield	17	4	June 29, 1922
Fort Madison	20	6	June 9, 1922
Iowa City	2,924	22	Apr. 25, 1922
Keokuk	124	18	June 21, 1922
Lamoni	2	0	Nov. 13, 1921
Lenox	11	4	Aug. 4, 1921
Oskaloosa	6	0	Nov. 10, 1921
Ottumwa	13	2	Nov. 6, 1921
Storm Lake	26	8	Feb. 22, 1922

But even though the treated waters do show unsatisfactory condition at times, this unsatisfactory condition in their cases is small compared to the other sorts of sources.

The cities and towns which have water purification plants are as follows:

Chlorination plants, treating the water with liquid chlorine. Regular installations:

Akron, Arnold's Park, Audubon, Avoca, Boone, Brooklyn, Camp Dodge, Cresco, Cherokee State Hospital, Clarinda State Hospital, Des Moines, Dubuque, Everly, Jefferson, Hedrick, Lisbon, Newton, Odebolt, Sac City, Sanborn, Waterloo, Woodward State Hospital.

Emergency installations:

Cedar Falls, Fort Dodge, Muscatine.

Coagulation plants, (those using chlorine are noted thus: (Cl).)

Corning (Cl), Council Bluffs (Cl), Lamoni.

Filter plants, (those using chlorine are shown thus (Cl); those using calcium hypochlorite are shown thus (Hypo).:)

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), Keokuk (Cl), Osceola (abandoned), Oskaloosa (Hypo), Ottumwa (Cl), Storm Lake (Cl).

The examinations made by the water laboratory are what are known as sanitary chemical and bacteriological examinations. Industrial, boiler and medicinal analyses are not made as these are usually commercial in their nature and the act of the thirty-sixth general assembly under which the laboratory functions specifies that the examinations made shall be made "in the interest of the public health and for the purpose of preventing epidemics of disease."

The act of the thirty-sixth general assembly requires, as has been stated above, that a fee be paid for the work. This fee, which has been set at one dollar must be charged 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 purpose of the laboratory. In addition to the statutory fee the senders of samples of water for examination are also required to pay the express charges upon the containers when received from the laboratory, and on returning the filled containers to the laboratory for the examination of specimens. The express charges are not high.

The container which has been adopted for use is the product of some experimentation by the laboratory staff. It is very satisfactory for the conditions under which work must be done in Iowa. The container consists of a wide-mouth, glass-stoppered bottle, carefully cleaned with a solution of sulphuric acid and potassium bichromate, washed and drained, and then sterilized by heating in a hot-air oven for an hour at a temperature of about 200°C. After sterilization the bottle stopper is covered with a sheet of sterile aluminum foil, and this is protected by a piece of muslin, tied down around the neck of the bottle and sealed with an official departmental seal. The seal insures that the bottle is received in sterile condition. The bottle is then placed in a galvanized iron cylinder with slip cover, and packed in a square wooden box, using excelsior packing. The wooden box is really a fireless cooker, for it contains a metal lining insulated from the wood of the box by felt, or cork. The box may contain one or two bottles with equal satisfaction. On the return trip a part of the excelsior is to be removed and its place taken by cracked ice. The cylinders are of such size that they will not fall over during shipment and fill with the water produced by the melting ice. The ice is necessary in order to minimize chemical and bacterial changes in the water, which take place rapidly at the ordinary temperature. In order to give the right report upon an examination of a water the sample should have as nearly as possible the same composition when analyzed as when it was drawn from the tap, or pumped from the well.

Full directions are forwarded with the container, and a questionnaire to be filled out with all pertinent data, is included. Only such data is asked for as experience has shown to be essential for a proper understanding of the conditions at the source of the water supply, but a reasonable amount of information is insisted upon in order to avoid error in judgment.

Upon receipt of the sample at the laboratory the examination is promptly begun and pushed forward with all possible speed. Usually there are a number of samples going through the examination at the same time. The analysis is gone over carefully when the data is complete and a report is made upon it in writing. Usually the report can be completed and mailed to the sender of the sample within a week or ten days after the sample is received at the laboratory.

In reporting upon the samples received at the laboratory in our containers it is necessary for us to assume that the directions given for

the collection have been properly followed, and that the sample actually represents the condition of the water of the supply without any outside contamination incident to its sampling. It is unfortunately the case that occasional samples are contaminated in collection due to carelessness or failure to read and appreciate the directions which are so carefully laid out for the guidance of the collectors of the samples. Whenever there appears to have been contamination of a sample—as well as can be judged at the laboratory—opinion on the sample is reserved or the sender is advised to send in a duplicate sample for comparison and is at the same time warned of the difficulty in the proper taking of water specimens.

It would be better if the specimens could be taken by fully instructed representatives of the State Board of Health, but except in the case of railroad water supply samples which are usually collected by the state sanitary engineer or his assistant, this is seldom possible. It is realized that to attempt to require such specially trained persons to collect all water samples would not be feasible, by reason of its expense, and the extent of the necessary personnel.

and the extent of the necessary personnel.

The report upon the specimen of water, whether received from a municipality or a private individual, is made out giving the full analytical data and the conclusion as to the condition of the specimen. If the examination shows the water to be satisfactory it is marked "satisfactory at this time" in order to convey the idea that the analysis cannot guarantee the future condition of the water, and the report is mailed to the sender. If the water is suspicious, unsatisfactory, or actually unsafe, the report made out as above is accompanied by a special letter explaining the matter and suggesting how the condition might be remedied if it seems likely that an improvement is possible.

A carbon copy of the report upon the water is sent to the mayor of the town from which the sample came, as the mayor is the chairman of the local board of health and should know of the condition of the water supplies under his jurisdiction, whether they be good or whether they be bad.

During the current biennium the practice of sending an additional carbon copy of all reports on water samples to the sanitary engineer of the state board of health has been adopted. This puts all the information in regard to water supply conditions in a community at the command of the engineer and enables him to look up conditions without delay.

Persons who enquire about the results of analyses made for others in their community are referred to the mayor having jurisdiction, since he is in a better position than the laboratory force to know whether the information should be given or withheld.

Since the water laboratory is very anxious to supply only correct information, and to give advice which is worthy of the confidence of the public, the examinations are made by properly qualified workers and by no other persons. Student work is not utilized in the work of the laboratory. Moreover no printed standard of analytical values is used

or advocated, but the report upon each sample is made after a full consideration of the particular case. Standards are so difficult to apply and it is necessary to cite so many exceptions that they are likely to lead to error.

Sewage and sewage disposal are intimately connected with the protection of water supplies. Sewage is very likely to contain the specific bacteria that cause typhoid fevers and other intestinal diseases. The entrance of sewage-like material into a water is therefore dangerous. Moreover, sewage may create a nuisance. It should be disposed of in such a manner that it is not allowed to endanger the health of man or beast or give rise to objectionable odors or appearances. Samples of sewage plant effluent may be examined in the laboratory when it is desired to know what degree of purification has been effected. However, samples of sewage alter in character even more rapidly than do samples of water, and the examination is best made very near to the source of the sewage samples. The most complete series of examinations of sewage which have been made by the water laboratory have been made on the plant effluents of the sewage treatment works at Oakdale and at Grinnell as detailed in earlier biennial reports of the State Board of Health.

SPECIAL INVESTIGATIONS

The greater part of the work of the water laboratory force is of course confined to the laboratory itself. However, in the prosecution of the work it has been necessary to make a certain number of field trips for investigations and inspections. During the biennium, Mr. Hinman, the chief of the water laboratory division, has made nineteen trips and has made 68 inspections as follows:

1920		City	Purpose
July	9	Grinnell	Inspection of water works to determine cause of unsatisfactory water.
		Cedar Rapids	Inspection of water works.
July	26	Waterloo	Inspection of water works.
	27	Storm Lake	Inspection of water works and sewage plant.
	28	Spencer	Inspection of water works.
		Arnold's Park	Inspection of sanitary conditions at amusement parks.
	30	Council Bluffs	Inspection of water works.
Aug.	24	Cedar Rapids	Inspection of water works.
	27	Davenport	Inspection of filter plant.
Sept.	17	Fort Dodge	Inspection of water works.
Oct.	12-13	Sac City	Inspection of water works system.
Dec.	1	Kanawha	Inspection of city wells and sewage plant.
	8	Oskaloosa	Inspection of filter plant.
	20	Cedar Rapids	Inspection of spring water plant.
	30	Ottumwa	Inspection of filter plant.
	30	Fairfield	Inspection of filter plant.
	31	Burlington	Inspection of filter plant.
1921			
Jan.	11	Ft. Madison	Inspection of filter plant.
	12	Shopton	Inspection Santa Fe Ry. supply.
	12	Keokuk	Inspection of filter plant.
	13	Centerville	Inspection of filter plant.
	13	Albia	Collection data on water supply from city official (en route).
	13	Chariton	Inspecting filter plant.
	14	Creston	Inspecting filter plant.
	14	Osceola	Inspecting filter plant.
Aug.	4	Camp Dodge	Inspecting water supply before arrival of national guard.
	5	Davenport	Advising regarding removal of algae.

Oct.	29	Creston .....Inspecting water works (en route).
	29	Corning .....Inspecting water works.
	29	Clarinda .....Inspecting filter plant.
	29	Clarinda .....Inspecting water supply of Clarinda State Hospital account typhoid fever in hospital.
Nov.	4	Brooklyn .....Advising concerning proposed supply.
Nov.	4	Newton .....Inspecting water works system.
	18	Mason City.....Inspecting city and Decker Co. sewage treatment plants and the Northern Sugar Plant with reference to pollution of Lime creek.
	19	Clear Lake.....Inspecting filter plant.
	19	Rockford .....Inspecting filter plant.
	19	Marble Rock.....Inspecting filter plant.
	19	Greene .....Inspecting filter plant.
	19	Waterloo .....Inspecting water supply.
	28	Bedford .....Inspecting filter plant.
	28	Lenox .....Inspecting filter plant.
Nov.	29	Lamoni .....Inspecting water supply and sewage treatment plants.
	29	Corydon .....Inspecting filter plant.
	30	Indianola .....Inspecting water works and proposed new wells and sewage treatment plant.
	30	Des Moines.....Inspecting New Water Plant.
1922		
Jan.	16	Cedar Rapids.....Conferring with mayor re swimming beaches.
	16	Fort Dodge.....Inspecting water works.
	16	Waterloo .....Inspecting water works.
	17	Storm Lake.....Inspecting water works and sewage treatment plant.
	17	Spencer .....Inspecting changes in vicinity of water works.
	18	Sioux City.....Inspecting water works.
	19	Sioux Center.....Inspecting water works and sewage treatment works.
March	10	Marshalltown ....Emergency in regard to pollution of city water by break in suction main.
April	17	Burlington .....Inspection of water works.
	17	Fairfield .....Inspection of water works.
	18	Keokuk .....Inspection of filter plant.
	18	Ft. Madison.....Inspection of filter plant.
	19	Muscatine .....Inspection of water system.
	19	Davenport .....Inspection of water works.
	20	Clinton .....Inspection of water works.
	20	Cedar Rapids.....Inspection of water works (en route).
June	13	Ames .....Inspection of city water plant.
	14	Jewell .....Inspection of water works and sewage treatment plant.
	15	Woodward .....Inspection of water works of Woodward State Hospital.
	29	McGregor .....Inspection of water works.
	29	Lansing .....Inspection of water works.

Most of these trips were visits to the water filtration plants of the state. The inspections of these were made so that when samples came in from the treatment plants the chief of the water laboratory division would have some knowledge of the plant and could suggest possible sources of difficulty from his knowledge of the operation, the plant equipment, and the results of the analysis. By the close of the biennium Mr. Hinman had visited all the filter plants known to be operating upon the water supplies of the state.

Considerable emphasis was also put upon the matter of making contacts with the plant operators, explaining to them just what the water laboratory could do to help them, what was expected of them in the protection of their water supply, and the need of close liaison with the laboratory.

OTHER INVESTIGATIONS

Railroad Water Supplies:

More attention than ever before has been given to the water supplies used by the railroads in obtaining water for passengers in interstate traffic. This was in accordance with the agreement whereby associate sanitary engineer H. H. Wagenhals, of the United States public health service was detailed to make a preliminary inspection in Iowa late in 1919. The state sanitary engineer and his assistants have made sanitary inspections of these supplies, and the samples collected by them, or some one delegated by them, have been examined at the water laboratory and the results used in deciding whether or not the supplies could be certified to the United States public health service as satisfactory.

Burlington:

The Citizens Water Company, of Burlington, has continued to have the product of its plant examined by the water laboratory at frequent intervals. From one to three samples are examined each week.

The State University of Iowa:

The water laboratory has continued to keep a close watch over the swimming pools at the men's gymnasium and at the women's gymnasium, and to supervise the treatment given the water. Daily examinations are made on all days that the pools are open for use. These examinations are made on the water after the use for the day is over and hence always represent the pool at its worst condition. When the water becomes too difficult to treat, the pool is emptied. The number of bathers at the men's gymnasium is very large, and it is hoped soon to have in operation an ultra violet ray sterilizer so that it will not be necessary to use so much chemical.

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 by the company's filter plant are made, and the chief of the water laboratory oversees the chemical treatment given to the water. Reports upon the condition are made to the company and to the president of the university at weekly intervals. By means of this service it is possible to keep the city water in satisfactory condition most of the time in spite of the fact that the plant was designed as an iron removal plant and is now performing duty in excess of that for which it was designed. At times when the water is found to be unfit for drinking purposes, or unsafe, the people of Iowa City, and the student body are promptly warned by bulletins and through notices inserted in the public press.

The Emergency Chlorinator:

A portable chlorine apparatus for the administration of liquid chlorine has been lent to the State Board of Health 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. It has been sent out on but one emergency thus far. In March, of 1917, there was an epidemic of diarrhea at Cedar

Falls coincident with contamination of the city wells at a high stage of the river. The chlorine was applied to destroy any pathogenic bacteria that the water might contain. The plant has since installed an apparatus of this sort and commences chlorination as soon as the river begins to rise toward the point at which contamination was noticed. Parts of the emergency chlorinator have also been lent to the Iowa City Water Co. at times when parts of their two chlorinators were in New York for repair.

The Extent of the Use of the Water Laboratory:

The water laboratory has analyzed samples from 98 counties and from 562 cities and towns. The only county from which samples have not been received is Clarke county. In addition to the samples from the cities and towns many came from the country and were reported as from various townships. The communities which are not listed have presumably failed to take advantage of the services which the state has provided for them. The service is called to the attention of the mayor of each community which fails to take advantage of the service. In the case of the cities and towns which have their own supplies the mayor is notified once in six months when no sample has been received. It is possible that there may be one or two communities from which samples have been received and which have not been credited therewith. This is usually due to lack of data accompanying the sample. It is always desirable that there be sufficient data to allow positive identification of the source of the specimen.

CITIES AND TOWNS FROM WHICH SAMPLES OF WATER WERE RECEIVED DURING THE BIENNIUM 1920-1922.

Adair county—Adair, Bridgewater, Fontanelle, Greenfield.

Adams county—Corning, Nodaway, Prescott.

Allamakee county—New Albin, Waukon, Harpers Ferry, Postville.

Appanoose county—Centerville, Moravia, Moulton, Mystic.

Audubon county—Audubon, Exira, Gray, Kimballton.

Benton county—Atkins, Belle Plaine, Blairstown, Keystone, Norway, Shellsburg, Urbana, Vinton.

Blackhawk county—Cedar Falls, Hudson, Jesup, LaPorte City, Waterloo.

Boone county—Boone, Fraser, Madrid, Luther.

Bremer county—Readlyn, Sumner, Tripoli, Waverly.

Buchanan county—Brandon, Fairbanks, Hazleton, Independence, Winthrop.

Buena Vista county—Albert City, Alta, Linn Grove, Marathon, Newell, Storm Lake, Truesdale.

Butler county—Allison, Aplington, Aredale, Clarksville, Dumont, Greene, Kesley, New Hartford, Parkersburg, Shell Rock.

Calhoun county—Auburn, Jolley, Lake City, Lohrville, Manson, Pomeroy, Rockwell City, Somers.

Carroll county—Arcadia, Carroll, Coon Rapids, Glidden, Halbur, Manning, Templeton.

Cass county—Atlantic, Cumberland, Marne, Wiota.

Cedar county—Bennett, Clarence, Durant, Lowden, Mechanicsville, Stanwood, Tipton, West Branch.

Cerro Gordo county—Clear Lake, Mason City, Meservey, Plymouth, Rock Falls, Rockford, Rockwell, Ventura.

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

Chickasaw county—Fredericksburg, Lawler, New Hampton.

Clarke county—None.

Clay county—Dickens, Everly, Peterson, Rossie, Spencer, Webb.

Clayton county—Elkader, Elkport, Garber, Guttenberg, Luana, Marquette, Monona, Strawberry Point, Volga.

Clinton county—Calamus, Delmar, Dewitt, Grand Mound, Lost Nation, Low Moor, Lyons, Wheatland.

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

Dallas county—Adel, Dallas Center, DeSota, Linden, Minburn, Perry, Redfield, Woodward.

Davis county—Pulaski.

Decatur county—Garden Grove, Lamoni, Pleasanton, Van Wert.

Delaware county—Edgewood, Greeley, Hopkinton, Manchester, Masonville, Oneida, Ryan.

Des Moines county—Burlington, Mediapolis, Yarmouth.

Dickinson county—Arnold's Park, Camp Foster, Haywards Bay, Milford, Spirit Lake, Terrill, West Okoboji.

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

Emmet county—Armstrong, Estherville, Ringsted.

Fayette county—Arlington, Clermont, Elgin, Hawkeye, Maynard, Oelwein, Waucoma, West Gate, West Union.

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

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

Fremont county—Farragut, Hamburg, Locust Grove, Sidney, Tabor.

Green county—Churdan, Grand Junction, Jefferson, Paton, Rippey, Scranton.

Grundy county—Dike, Grundy Center, Stout.

Guthrie county—Bagley, Bayard, Casey, Guthrie Center, Menlo, Panora, Stuart, Yale.

Hamilton county—Jewell, Kamrar, Stanhope, Webster City, Williams.

Hancock county—Britt, Crystal Lake, Garner, Kanawha, Klemme.

Hardin county—Ackley, Alden, Buckeye, Eldora, Iowa Falls, New Providence, Radcliffe, Union, Whittier.

Harrison county—Dunlap, Logan, Missouri Valley, Modale, Persia, Woodbine.

Henry county—Mt. Pleasant, Mt. Union, New London, Winfield.

Howard county—Alma, Cresco, Lime Springs, Protivin.

Humboldt county—Bode, Hardy, Humboldt, Livermore, Renwick, Rutland, Thor.

Ida county—Arthur, Battle Creek, Galva, Holstein, Ida Grove.

Iowa county—Amana, Conroy, Marengo, North English, Parnell, South Amana, West Amana, Williamsburg.

Jackson county—Bellevue, Maquoketa, Miles, Preston, Sabula.

Jasper county—Baxter, Colfax, Kellogg, Lynville, Mingo, Monroe, Newton, Prairie City.

Jefferson county—Brighton, Fairfield, Packwood.

Johnson county—Coralville, Kalona, Iowa City, Oakdale, Oxford, Solon, Tiffin.

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

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

Kossuth county—Algona, Fenton, Ledyard, Swea City, Titonka, Wesley, Whittemore.

Lee county—Donnellson, Ft. Madison, Keokuk, Mt. Hamill, Shopton, West Point.

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

Louisa county—Columbus City, Columbus Junction, Concord, Cotter, Morning Sun, Wapello.

Lucas county—Chariton.

Lyon county—Alvord, Doon, George, Lester, Rock Rapids.

Madison county—DeSoto, Earlham, Macksburg, Patterson, Winterset.

Mahaska county—Leighton, Oskaloosa.

Marion county—Columbia, Knoxville, Melcher, Otley, Pella, Pleasantville.

Marshall county—Conrad, Dunbar, Gilman, Green Mountain, La Moille, Le Grand, Liscomb, Marshalltown, Melbourne, Minerva, Rhodes, State Center, St. Anthony.

Mills county—Glenwood, Malvern, Pacific Junction.

Mitchell county—Mitchell, Osage, Riceville, St. Ansgar.

Monona county—Danbury, Mapleton, Moorhead, Onawa, Soldier, Whiting.

Monroe county—Albia, Bucknell, Hiteman, Melrose.

Montgomery county—Red Oak, Stanton, Villisca.

Muscatine county—Atalissa, Letts, Muscatine, Nichols, West Liberty, Wilton Junction, Wilton.

O'Brien county—Archer, Hartley, Paullina, Sanborn, Sheldon, Sutherland.

Osceola county—Ashton, Harris, Melvin, Ocheyedan, Sibley.

Page county—Clarinda, Coin, Shenandoah.

Palo Alto county—Ayrshire, Emmetsburg, Graettinger, Le Mars, Mallard, Ruthven.

Plymouth county—Craig, Kingsley, Merrill, Remsen.

Pocahontas county—Fonda, Gilmore City, Laurens, Palmer, Plover, Rolfe.

Polk county—Camp Dodge, Des Moines, Herrold, Mitchellville, Runnels, Valley Junction.

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

Poweshiek county—Brooklyn, Grinnell, Montezuma.

Ringgold county—Alston, Kellerton, Maloy, Mt. Ayr.

Sac county—Auburn, Earley, Lytton, Odebolt, Sac City, Schaller, Wall Lake.

Scott county—Bettendorf, Buffalo, Davenport, Dixon, Eldridge, Le Claire, McCausland, Princeton.

Shelby county—Defiance, Harlan, Kirkman, Portsmouth, Shelby.

Sioux county—Alton, Boyden, Hawarden, Hospers, Hull, Ireton, Orange City, Rock Valley, Sioux Center.

Story county—Ames, Collins, Colo, Fernald, Gilbert, Huxley, McCallsburg, Nevada, Story City, Zearing.

Tama county—Clutier, Dysart, Elberon, Garwin, Gladbrook, Montour, Tama, Toledo.

Taylor county—Bedford, Clearfield, Conway, Lenox.

Union county—Creston, Cromwell, Lorimor, Shannon City.

Van Buren county—Cantril, Douds, Selma.

Wapello county—Eddyville, Eldon, Ottumwa.

Warren county—Carlisle, Indianola, Lacona, Martinsdale.

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

Wayne county—Cambria, Clio, Corydon, Humeston.

Webster county—Dayton, Duncombe, Ft. Dodge, Gowrie, Harcourt, Lehigh, Stratford, Vincent.

Winnebago county—Forest City, Lake Mills, Thompson.

Winneshiek county—Calmar, Decorah, Nordness, Ridgeway.

Woodbury county—Anthon, Cushing, Danbury, Lawton, Moville, Oto, Pierson, Salix, Sioux City, Smithland.

Worth county—Manly, Northwood.

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

Most of the work of the water laboratory is done upon public supplies, but a considerable number of samples of water from private wells are sent in for examination. The following table gives in detail the distribution of the work, and the results obtained:

REPORT FOR 1920-21; 1921-22; WATER DIVISION

Public	1920-21	1921-22	1920-22	1920-21	1921-22	1920-22	1920-21	1921-22	1920-22	1920-21	1921-22	1920-22
	Good			Bad			Doubtful			Total		
Shallow wells	112	148	260	139	160	299	30	70	100	281	378	659
Deep wells	172	242	414	107	90	197	30	41	71	309	373	682
Springs	15	7	22	17	10	27	3	0	3	35	17	52
Treated	532	780	1,312	26	79	105	29	68	97	587	927	1,514
Raw stream		1	1	404	385	789			0	404	386	790
Lakes, etc	2	0	2	4	1	5	1		1	7	1	8
Ice			0		4	4			0		4	4
Cisterns			0		2	2			0		2	2
Miscellaneous	1	2	3	6	2	8		0	0	7	4	11
Sewage			0		7	7			0		7	7
Swimming pools	315	400	715	54	24	78	88	92	180	457	516	973
Total	1,149	1,580	2,729	767	764	1,531	181	271	452	2,007	2,615	4,712
Private—												
Shallow wells	69	95	164	345	348	693	50	144	194	464	587	1,051
Deep wells	29	348	377	31	46	77	8	17	25	68	411	479
Springs	4	4	8	3	9	12	2	1	3	9	14	23
Streams		2	2	6	15	21	1	0	1	7	17	24
Ice		4	4	1	8	9	2	6	8	3	18	21
Cisterns	3	5	8	11	6	17		3	3	14	14	28
Miscellaneous	3	1	4	5	8	13	1	0	1	9	9	18
Total	108	459	567	402	440	842	64	171	235	574	1,070	1,644
Ownership not stated												
Shallow wells												
Deep wells												
Springs					1	1					1	1
Streams												
Ice												
Cisterns												
Miscellaneous					3	3					3	3
Total					4	4					4	4
No data				1	3	4				1	3	4
Total	1,257	2,039	3,296	1,170	1211	1,238	245	442	687	2,672	3,692	6,364

RECOMMENDATIONS:

The recommendations in the last biennial report included the more intensive investigation of the water supplies used by the railroads for supplying passengers, and the employment of a fully qualified junior water bacteriologist and chemist. These recommendations have been approved and proper provisions made. The space at present available for the water laboratory has not been increased and with the increasing amount of work to be handled, the crowding of the laboratory is now a serious matter. There is urgently needed at least twice the present space. There should be a media kitchen, an office room, separate chemical and bacteriological laboratory rooms, and a room for the storage of equipment, outfits and supplies and for the shipping of containers. It is probable that the present assistance will need to be materially increased during the biennium to come on account of the increase in work which seems certain.

In the way of extension of the functions of the laboratory it is recommended that a thorough study be made possible in connection with the water supplies of county fair grounds, community tourist camps, amusement centers and in the lake region. Some sort of supervision over the water supplies along the main lines of tourist travel is urgently needed. A study of the sanitary conditions of the chief streams in Iowa is also an important need. The communities of the state will need to turn more and more to surface supplies for their water and it is very important that the streams be kept in such condition that water from them may be treated safely by standard types of water purification apparatus. Studies upon the efficiency of sewage treatment plants are also needed. For much of this work the water laboratory would need field laboratories and crews. If one of the mobile laboratory trucks or the Sterilab trucks used by the United States army in the late war could be obtained, it would serve admirably as a movable laboratory, obtaining its supplies from the main water laboratory, but doing its work at the place under investigation. This work would of necessity have to be confined to the summer months.

In the laboratory itself work could be done on the sands used in water purification plants and in sewage filters. If the sand were to be required to be approved by the laboratory, the use of sand of improper size, or too loaded with silt might be avoided. A small amount of additional apparatus would be necessary for this work.

Another line of work to which the water laboratory has been looking forward as soon as authorization, space, and assistance permit, is the making of mineral analyses of supplies of state institutions and municipalities, as well as the mineral examination of waters from test wells being sunk in the search for suitable water by these organizations. At the present time only examinations directly in the interest of the public health and for the purpose of preventing diseases are made. The mineral composition of waters is often of great economic importance to the community or institution, and if the mineral character is objectionable, the citizens and visitors will always prefer to use the private shallow wells which are usually much less safe than the more closely watched municipal or institutional supply.

IV. EPIDEMIOLOGY DIVISION

Merle R. French, Chief

During the two years, from July, 1920, to July, 1922, the epidemiological division has had opportunity for observing many epidemics of contagious diseases in various parts of the state. During this time over fifty investigations have been made to determine the sources of infection, modes of spread or means of combating disease in its epidemic form and to settle controversies. Members of the staff have made fourteen field investigations of diphtheria, ten field investigations of smallpox, ten field investigations of scarlet fever, five investigations of typhoid fever, four investigations of poliomyelitis, three investigations of chickenpox, one of cerebrospinal meningitis and two sanitary surveys.

DIPHTHERIA

This is one of the diseases which, although the cause and some of the methods of prevention are well known, still persists as an epidemic disease. This is due to the fact that there are so many mild and missed cases, and carriers, that are not detected. This is particularly true in the schools. To detect the carriers, missed and early cases, it has been found to be very profitable to examine and culture the noses and throats of all school children, and instructors in the room or school where a case developed.

Carriers

Letts, Carrier. Four cases of diphtheria appeared in the towns of Letts. These cases were school children who had been going to school up until the onset of their illness. Since there had been 4 cases up to the present, there seemed to be a possibility of carriers. Upon culturing the school, 240 in number, it was found that there were four carriers with no clinical symptoms and five with positive cultures developed clinical diphtheria.

Granger, Carriers. Law enforcement. Nonobservance of quarantine. It is, many times, among the foreign population that epidemics of diphtheria spread so rapidly. This was true in the epidemic at Granger. The people not realizing the danger from diphtheria would not observe strict quarantine and whenever they felt well enough to get about would wander at will in the community. To combat such a situation, it was necessary not only for the epidemiologist to warn the people in quarantine, but likewise instruct the local board of health in regard to their powers and duties. Upon culturing the children in the school, seven carriers were found.

Clarion. School-carriers. Occasionally it is very easy to pick out the case that introduces an epidemic of diphtheria into the school. Diphtheria was introduced into the Clarion schools by a boy who attended school for several days with a mild sore throat and then went home to die of diphtheria. The most practical way to fight this epidemic was to culture the entire population of the schools. This was done twice and from the 500-600 cultures taken, were found for the second time, five positive throats and sixteen doubtful. The importance of culturing not only the pupils, but likewise the teachers was revealed when it was found that the superintendent of schools was a carrier of diphtheria bacilli.

Lehigh. School-carriers. Missed cases. At Lehigh the epidemiologist was called in after the culturing of all the children in the schools had been completed. In this instance from the 217 cultured were found 39 carriers. These had been isolated in the homes and school was closed. The people, aroused by such rigid measures, were complaining and finding fault with the work of the health officer. The epidemiologist in a two-hour session with the local board of health, explained the epidemiology of diphtheria. Then he helped with culturing of those carriers for release. This town, a mining town, had several families of foreign birth. These people, although ill, would not call a physician, and thus the disease was spread. To overcome this evil the local board of health had given the local health officer a written order to visit and examine children in four families. The epidemiologist and the health officer visited one family under suspicion, and found a child with a membrane in its throat.

Douds. Carrier. Diphtheria appeared in this community in one of its most treacherous and dangerous forms. A child attending school developed croup and difficulty in breathing. The true nature of the disease unfortunately was not recognized until too late. Upon culturing the room of 29 pupils with whom the child played, one carrier was found. This situation had been handled rather uniquely by the local board of health, in that all the children exposed had been given 1,000 units of antitoxin. Then school had been dismissed for a week and children ordered to remain at home during this time, under penalty of the law.

Schick Test in Schools

Ankeny. Brighton. At these two places there was no pending epidemic, but there had been a few cases in the first town, and in the second town, there were several cases in the surrounding country. At Ankeny, there had been a few cases in the lower grades and the local authorities wished for information as to the best methods of coping with the situation. The children in the lower grades had been cultured twice without finding a single carrier. The Schick test was applied to about twenty children in the school and in the evening a short address was given to the Parent-Teachers' Association, to give them an idea as to how best to cooperate in the situation.

Controversy. Diphtheria

Adel. In this town, one physician seemed to have all the cases of diphtheria in his practice and there was some question among the people whether it was truly diphtheria or not. It fell upon the epidemiologist to examine every case under suspicion. Thirty-five cases of four physicians were examined, with a finding of clinical diphtheria or positive cultures in nine cases. Nineteen children in the grades were cultured, and one positive culture for diphtheria found. Thus the local board was justified in taking as rigid measures as they did in closing the school and asking for aid from the state board of health.

State Institutions of Iowa. Diphtheria

During the past two years diphtheria has assumed epidemic proportions in four of the state institutions of Iowa. In two of the institutions, Independence State Hospital, and Mt. Pleasant State Hospital, the epidemic was prevalent in an adult population, while in the other two, the Soldiers' Orphans' Home, at Davenport, and the Juvenile Home, Toledo, the inmates were all children ranging in age from a few months to 16 years of age.

Juvenile Home, Toledo. *Culture.* Diphtheria was introduced into the Juvenile Home three times during the past two years. Fortunately in the first introduction the case was detected early and no further cases developed from it. But 21 days later some of the children returning from another institution developed the disease and exposed many of the other children in this institution. As a temporary measure, all the contacts had been immunized with antitoxin and all cultured to detect early cases and carriers. Thus the situation was cleared for the time being. But about nine months later in October, 1921, upon the third introduction of the disease by a principal in the school the susceptible children readily contracted the disease. Culturing and quarantining carriers again cleared up the situation temporarily. The Schick test and toxin-antitoxin immunization was recommended but was not accepted at that time.

Soldiers' Orphans' Home, Davenport. *Diphtheria.* Reports concerning the *Schick test* and *Toxin-Antitoxin*—result of *one year's time.*

In the Soldiers' Orphans' Home were four hundred boys and girls, ranging in age from a few months to 16 years of age.

During the past year, October, 1920–July, 1921, there had been at least 29 cases of diphtheria with one death. Every month had one to several cases, except for three months which were clear. Culturing for early cases and carriers, the Schick testing and the giving of toxin-antitoxin to all found to be susceptible, was carried out. Four hundred seventy-five cultures were taken the first time and 38 returned as positive for diphtheria, 4 of them, however, turned out to be clinical cases. Of the carriers, 5 were employes and 29 children. One of the employes, a cook, with a positive culture had had a mild sore throat. The carriers among the children were scattered; 2 girls worked in the dining hall, 1 in the hospital; of the boys, 2 worked in the dairy, 1 in the hospital. The carriers were quarantined for 2 negative cultures. All were recultured in a week. The Schick test was given without the control test of heated toxin, revealed out of 360 who took it, 90 children and 5 employes who were susceptible. Ninety of the children and 3 of the employes were given the first injection of toxin-antitoxin. About 15 children and 2 adults had severe enough general reaction together with the local reaction to warrant going to bed. The second and third injections did not cause nearly so great a constitutional and general reaction. One boy seemingly had a flare-up of an old chronic nephritis from the toxin-antitoxin, and second and third injections were omitted. Following this work for the past year toxin-antitoxin immunization has been continued. Every child who enters the institution for the first time receives the immunization. Five hundred forty-four children during the past year have received the active immunization by toxin-antitoxin.

The result from these measures reveal very clearly that diphtheria as an epidemic disease can be practically eliminated. Not a child who received toxin-antitoxin developed the disease this year. During the past twelve months from August, 1921, to August, 1922, only 7 cases of diphtheria have developed, compared with 29 cases and 1 death the year before. Not a single one of these 7 had received the toxin-antitoxin injections. Three were cases which occurred during the first part of August, 1921, when the epidemic was in full sway, or just dying out. 4 were new arrivals in the institution and were incubating the disease when they entered and developed it a few days after arrival. Thus not a single case after the epidemic was cleared up, in August, 1921, has occurred among the children in the institution, except the 4 new arrivals. This is remarkable especially in view of the fact that these 400 children are not isolated or kept in the home but are allowed to go down town with their escorts and come in contact with people in the street, and in the movies, etc., and Davenport is a city where diphtheria has been particularly prevalent during the past year.

Independence State Hospital, Independence. *Diphtheria. Culture, Schick Test, Toxin-Antitoxin.*

Diphtheria was introduced into the Independence State Hospital containing 1,200 patients by a patient entering the receiving ward in the infirmary in July, 1921. Following this case a few sporadic cases developed during the following months until October, 1921, when an attendant in the infirmary developed an atypical case, and then several more became ill with diphtheria. At once a quarantine had been put on the infirmary and all in contact with these cases had received 1,000 units of antitoxin.

Since all had received antitoxin it was useless at this time to give the Schick test. All in the infirmary, patients, attendants and nurses were examined and cultured. From the 212 cultures taken, 30 were found to be carriers of diphtheria bacilli. Realizing that these measures were only temporary, the Board of Control consented to the Schick testing, and toxin-antitoxin immunization of susceptibles. So three months after the first visit, or in January, 1922, the work of Schick testing was begun.

Schick Test

Methods. Three doctors and several attendants did the work. One doctor arranged and planned the work in the various wards. Two doctors gave the test—one the control on the left forearm, and the other, the non-heated toxin on the other forearm.

Materials. Toxin 100 test outfits were used. One cc tuberculin syringes graduated in hundredths of 1 cc and 26 gauge ½-inch steel needles and Yale platinum iridium needles were used.

Preparation of Materials. Needles and syringes were boiled for 15 minutes before using. The toxin for the Schick test was mixed with the saline solution, just before using, and was never allowed to remain, after having been mixed, for more than two or three hours. The control toxin for the test was obtained by heating the diphtheria toxin to 75 degrees C. for ten minutes, thus inactivating the toxin but leaving the protein in solution.

Method of Administering the Schick

Before administering the test the flexor surface of both forearms of each patient just below the bend of the elbow was washed thoroughly with soap and water and then dried with sterile cotton. One doctor gave the control test of heated toxin on the left forearm and the other doctor the non-heated toxin or Schick on the right forearm. Two-tenths cc of

Schick material was injected into the superficial layers of the skin. Subcutaneous injections were repeated and done intracutaneously. The rule was followed to insert the needle in the superficial layer of the skin so that the eye or loop of the needle was just visible through the layers of the skin. Upon proper insertion of the needle, when the injection is made, the skin will raise in a small elevation in which the hair follicles stand out prominently as depressions. One needle was used to inject five patients. Between each separate injection the needle was wiped with sterile cotton and after using the needles on five patients, the needles were boiled.

Reading the Schick Test

The Schick test was read at 48-hour and 96-hour intervals, a preliminary at 48 hours and a final at 96 hours. The tests were read positive, negative, pseudonegative and combined positive. The positive readings were indicated by varying degrees of induration and redness on the right forearm in 48 and 96 hours, while the control on the left arm showed no redness. A negative Schick was indicated by no redness or induration on either forearm. The pseudonegative reactions were indicated by the same amount of redness and induration on both forearms, and the same amount of fading on each arm in 96 hours.

The *combined* positive usually revealed at 48 hours an area of redness very similar on both forearms, with perhaps less reaction on the left arm in 48 hours, while in 96 hours the control test on the left arm had markedly faded without any or much scaling, while the test on the right arm had not faded but stood out red and indurated and showed evidences of beginning scaling.

One thousand one hundred ninety-seven were given the Schick test and 351 were found to have positive or combined positive reactions. Thirty-five per cent of the female and 24 per cent of the male were found to be susceptible.

One pecular result was that of Dr. Stewart, superintendent, and some of the employes and patients with positive Schicks, who complained of a general malaise and lassitude lasting a day or so.

Toxin-antitoxin was not given at this time, but in April, 1922, after the appearance of a case of diphtheria in the institution, the active immunization was begun. From the toxin-antitoxin injections there was very little discomfort, most all of the reactions being local and the greatest amount from the first one. Here too, in this institution, the diphtheria incidence has been very slow—only one case in the last 11 months and that one an imported one.

Mt. Pleasant State Hospital. *Diphtheria Culture. Schick Toxin-antitoxin.*

Mt. Pleasant had had two epidemics—one early in the year 1922 and the other in May, 1922. The cases were scattered over the main building. The first epidemic seemingly cleared up only to return in May. Culturing, Schick testing and toxin-antitoxin immunization was instituted in the second epidemic. From the 658 cultures taken, 48 or 6 per cent returned as positive for diphtheria. The chief cook and one of her helpers

were found to be carriers. These carriers were not isolated at first but upon the incidence of a fresh outbreak they were isolated.

One thousand Schick tests were given and 237 male and female adults or 23.7 per cent were found to be susceptible, 20.8 per cent of the male and 27.5 per cent of the female patients were found to be susceptible.

All the 237 patients were given toxin-antitoxin; 7 of this number had very severe local and constitutional reactions following the first injection. The second and third injections gave much less local and constitutional reactions. The epidemic subsided after these measures and has not recurred in the past four months.

Scarlet Fever

Of all contagious diseases, scarlet fever is perhaps one of the most difficult to overcome, because of the high susceptibility of the children and the carelessness of parents and others in reporting the existence of this disease. Further there is no laboratory test that will aid in the detection of early, latent or missed cases as in diphtheria. Frequently this disease is spread by a missed case, very mild and atypical; and in the schools an old case with discharging ear or gland, will convey the contagion to others. Ten various investigations and trips have been made by the members of epidemiology division to different parts of the state the past two years. The only methods that are at present known to prevent the spread of the contagion of scarlet fever are proper and early recognition of cases, reporting and quarantining and disinfection. It devolves upon the physicians and the Local Board of Health to see that these measures are carried out. Members of the Epidemiology Staff have had the opportunity of addressing Local Boards of Health in six communities. At Allison there were no cases of scarlet fever, but several were in the surrounding country. Rumors were afloat of cases not in quarantine. In Douds and Leando, the Local Boards of Health were interested not only in scarlet fever, but diphtheria and school sanitation. Nashua, Kingsley and Manson were having epidemics of scarlet fever and the board members wished to know how to handle the situation.

One member of the local Board of Health at Le Roy was not satisfied with the way the doctor and Board of Health were quarantining his family, and wished to be released. But upon investigation the case was found to be still contagious and the quarantine was maintained. The Local Board of Health was met, and instructed in means and methods of prevention of contagion, especially of scarlet fever. In all of these communities, it was recommended that the school be kept open and that a daily medical inspection of school children be maintained during the time of the epidemic, by the nurse or the physician.

Unfortunately, it is not only the lay or non-professional people who cause trouble in these fights against contagious diseases, but also members of the medical profession are at fault. In two communities, Le Roy and Walnut, diversity of opinion concerning diagnosis demanded the attention of the State Board of Health. In both instances, the cases were typically scarlet fever and required quarantine: one cause of diversity of opinion was the non-realization that scarletina, or mild scarlet fever, is as contagious as severe scarlet fever.

Daily medical inspection of one of the schools in Iowa City was maintained for a time upon the outbreak of scarlet fever during the winter of 1922. In this way some missed cases of chickenpox were detected as well as cases of suspicious scarlet fever.

Smallpox

Lamoni. Introduction.

Occasionally the road by which smallpox travels into a community can be detected and the method of invasion can be definitely located. Such was the case at Lamoni. Upon visiting Lamoni it was found that there were fifteen cases of smallpox in the community. Investigation revealed that all these cases had arisen from a common source and had been acquired through contact.

A grandmother went to visit her granddaughter who was ill and had "sores" and "pimples." The grandmother returned home and in 14 days became ill and was sick for several days with symptoms very similar to smallpox. Fourteen days after her illness her daughter in the home became ill and then a daughter-in-law. The daughter attended a hard times social on a certain date while she was ill and all subsequent cases could be traced to having been exposed at the party or at the home of the grandmother.

Smallpox Methods of Control

There is still some question in the minds of some local health organizations in regard to the best methods and means of preventing the spread of smallpox. The emphasis many times has been entirely upon quarantining and disinfecting rather than upon proper vaccination. Vaccination should be placed first, then to be followed by proper isolation and disinfection; for if every one had the protection of having had a successful vaccination, there would be no smallpox.

In some communities, however, interest in public health matters is so little that neither vaccination or proper quarantining and disinfection is carried out. In other communities they are very eager and willing to carry out proper measures when so instructed.

Granger.

Five families were in quarantine for smallpox in this community. But no arrangements had been made to care for the people in quarantine to secure groceries, etc. Further, no effort had been made to vaccinate all the susceptible individuals in this community. It was recommended here that:

1. Vaccination be instituted.
2. A nurse be secured to aid in the work, and have proper measures instituted to care for those in quarantine.

Le Mars.

The local Board of Health at Lemars called in representative of the State Board of Health before an epidemic visited the community. There were six families in smallpox quarantine at that time. The local Board of Health and the school board were met and given such information as would help them, should they have an epidemic.

Ottumwa.

At Ottumwa it was found that smallpox was localized in one portion of the city, the greater majority south of the river and strange to say, among the school children, over 90 per cent of the cases were localized in one school. Here in this community it was emphasized, first, vaccination; second, quarantine.

West Chester. Vaccination.

The duties of the epidemiologist are varied. Due to the peculiar type of epidemic—mild cases—it was rather difficult to make a diagnosis in some cases. Any one seemingly with a skin lesion was kept under observation. Many of these cases had to be visited. Some were found to be smallpox and others just mild skin lesions as eczema. The local Board of Health and the school board were met and advised concerning best methods of combating smallpox. Vaccination was instituted in the schools.

The difficulty in combating smallpox is many times due to the mildness of the disease. The milder the disease the more difficult it is to keep the disease within limits, for many cases are missed, and others preferred to have the disease than be vaccinated. Such was the case at Decorah. One hundred twenty-one cases of mild smallpox were reported in this epidemic. Mild cases were reported to be walking the streets; others refused to be vaccinated. The mortality was nil. A contrast to this is to be seen in epidemics of very severe smallpox. Smallpox introduced into Bedford had a very high mortality. Only seven cases in all were reported with a result of four deaths. With a mortality this high, every one in the community was willing and ready to be vaccinated. In Blockton, 17 miles away from Bedford, three cases were reported with three deaths. Here too all the people were anxious to be vaccinated with the result that only three cases arose. The efficiency of vaccination was demonstrated very clearly here by the fact that of the fourteen relatives who lived in the houses where the cases were, not a one contracted smallpox. They had been vaccinated.

Typhoid Fever

During the past biennium six epidemics of typhoid fever have been observed and studied, two of these were milk borne; one was due to direct contact, also milk contamination and open privies; one was water borne; one was due entirely to direct contact with a case; and another was due to a carrier.

MILK BORNE TYPHOID—PELLA

Thirty-three cases of typhoid fever developed in Pella on approximately the same date. Upon investigation it was found that these cases were located in fourteen homes and all these homes secured their milk supply from one dairy. Each one of the homes supplied by this dairy had one or more cases of typhoid in them excepting two, and the people in these were receiving typhoid immunization. None of the milkers or others in the family at the dairy had had typhoid and they were definitely

proven not to be carriers of typhoid bacilli but a man who came for milk and occasionally helped with the dairy work was definitely proven to be a carrier. This man, undoubtedly the primary source for the epidemic, was definitely proven to be a missed case and a carrier. During the time that he was feeling particularly ill two or three weeks prior to the outbreak of the epidemic he came for milk, helped wash the pails at the well and used the privy at this place. The milk may have been contaminated directly by this individual as he helped with the milk pails or indirectly by the pails which were washed in the water of the well. This water was definitely proven to be heavily polluted with excrement possibly from the privy nearby. No other cases developed excepting along this milk route and consequently there can be no question but that the milk was the mode of conveyance for the typhoid organism in this epidemic.

MILK BORNE TYPHOID—WATERLOO

Sixteen cases of typhoid fever developed in the city of Waterloo within a period of three days. The large number of cases developing in so short a time indicated a common source of infection. Such was found to be the case. It was revealed that all these sixteen cases were located in ten homes and that these homes had a common milk supply, all their milk coming from a certain dairy. At this dairy it was also discovered that ten days to two weeks prior to the outbreak, one member of the family had been taken ill and a definite diagnosis of typhoid fever made. She remained in the home for three or four days before going to the hospital and during that time somehow contaminated the milk. This epidemic illustrates very clearly the importance of the prompt prohibiting of milk products from leaving a farm or dairy where there are cases of typhoid fever.

TYPHOID FEVER—ALBIA

DUE TO MILK—CONTACT—PRIVIES

The epidemic of typhoid fever at Albia was not due to any one common source but there were three distinct origins. The earliest cases were no doubt imported and secured their infection outside the city of Albia. Two members of the same family became ill with typhoid ten days to two weeks after returning from a visit to Missouri where they were infected. The third case, another member of this family, can date the onset of her typhoid to the exposure to the first two cases.

Seven of the latter cases, however, were located in homes that had a common milk supply and no other common food supply. They obtained their milk from a dairy that had been very lax in the matter of taking milk bottles away from the homes where the very first or imported cases of typhoid developed. These milk bottles were taken from the home where typhoid existed without even attempts at sterilization of the bottles.

Eight cases gave no history of being out of the city and had no common milk or water supply. The origin of these eight cases was traceable to the improperly constructed privies—the vaults were open so that flies and chickens had free access to the excreta. It is a common event to have typhoid fever appear in this particular part of the city at this time of the year. Thus from year to year the seed is planted and the epidemic springs out carried to the people from the privies by the flies or by the water from the wells which drain the privies.

TYPHOID FEVER—DUNREATH

WATER BORNE

Eight cases of typhoid fever developed in the country around Dunreath, a mining village, from June 14 to July 12, 1921. Upon investigation it was found that all these cases excepting one or possibly two (which were contact cases) obtained their typhoid infection from the water of an old open well. The water of this well undoubtedly was contaminated in some way by a certain missed case of typhoid. This missed case, No. 1, lived at the home where the well was located. Ten to fourteen days after his symptoms were most pronounced, cases No. 2 and No. 3 developed typhoid. These cases were hired men working the land and drank water from this open well but did not come in contact with the first case or eat at the same home. Then on June 29, case No. 4 developed typhoid. This case was a man who took the place of No. 2 and No. 3 farming the land. He also drank water from this said open well but did not eat at the house with case No. 1 or others in that home. But two weeks after beginning work and using the water, he became ill with typhoid.

The source of infection of case No. 5 also pointed towards the same well water. Case No. 6 developed typhoid ten days to two weeks after visiting at the home where he may have secured his infection from the well water or case No. 1 directly. Case No. 7 played at the home where the open well was for a while one day and used this same well water. She ate no food while there but ten days to two weeks after being there she became ill with typhoid. Case No. 8 had two possible sources for his infection; contact with case No. 4, her father or the well water. The source of infection of case No. 9 was undoubtedly contact with case No. 5, his father.

CONTACT-BORNE TYPHOID—GREELY

The importance of prompt and efficient concurrent disinfection of all excreta and discharges from the patient as well as the importance of proper personal cleanliness, is nowhere illustrated better than in the epidemic at Greely. The ten cases of typhoid fever were located in the country a few miles from Greely on three farms. The first case No. 1, the father developed typhoid fever in the spring of 1921. The source for this first case was not definitely determined but undoubtedly he secured his infection from outside the home for he had been to other towns a few weeks prior to the onset of his illness. All the subsequent ten cases could be definitely traced to the first case or following cases. Case No. 2 was the wife of the first case and case No. 3 was the daughter of the

first case and living in the home and caring for No. 1, secured their infection from No. 1. Then on July 25 two-three weeks after the onset of the second and third cases, No. 4, who was a married daughter and who had come to care for the sick mother, developed typhoid. On the same date No. 5, a hired man at the home, developed typhoid. Then on Aug. 1 five more in this same home became ill with typhoid. Although concurrent disinfection was carried on in a rather lax manner, still from the arrangements of the house, which was nothing but a shack, it was impossible to isolate the cases and flies were everywhere. There is no doubt about it that if proper concurrent disinfection of the bowel and bladder discharges of the first, second or third case and if proper personal cleanliness of those attending the case had been instituted, there would have been only one or two cases instead of ten with its resulting deaths. The most appalling thing of the entire situation was the fact that the local authorities had permitted the milk from this dairy of eighteen cows to be taken from the farm to the creamery where it was made into butter. The milk was being cared for by case No. 1 and case No. 5.

TYPHOID—FAIRBANK

CARRIER—IMPROPER SANITATION

It is stated that the incidence of typhoid fever is a reflection upon the sanitary equipment of a community. This is true to a certain extent and would be entirely true except for the presence of the carriers that handle food. Typhoid was not epidemic at Fairbank but rather cases had occurred ever now and then during the past year. To account for these cases contact infection was certainly in evidence and a carrier was detected. This carrier, a woman, denied ever having had typhoid but she had nursed her husband who had definitely had typhoid fever several months prior to this time. The other possibilities to be considered because of their construction and arrangement of sewers and wells are:

First: The sewerage system and water supply. Shallow vault privies in too close proximity to shallow, poorly covered wells were in evidence and were of great danger to this community and perhaps added to the incidence of typhoid fever. Further the practice of using ice obtained from a pond into which drained a number of non-treated sewers was also pernicious and dangerous and may have accounted for further cases.

POLIOMYELITIS

Infantile Paralysis or rather Poliomyelitis, for the disease is not limited by any means to infants or children, has required some attention from the Iowa State Board of Health. Four trips have been made to aid local physicians and authorities in their fight against this disease.

Webb, Iowa—Four cases of Poliomyelitis.

Poliomyelitis appeared in the town of Webb for the first time in years the latter part of the summer of 1921. Three of the cases were girls 14-16 years of age who during the incubation period had with fourteen other girls attended a Campfire cottage at Arnold's Park. Here these girls

probably came in contact with a carrier of the virus and thus were exposed to the disease. The fourth case was a little boy, a brother of one of the girls ill with Poliomyelitis. He can definitely date his incubation period from the time of exposure to his sister. Thus in this instance there is a definite history of exposure and after the proper incubation period the case developed. Such instances as these are not common because of the fact that so many individuals have a high immunity and even though exposed do not contract the disease. All these cases were properly quarantined, isolated and placarded and rigid concurrent disinfection was being carried out. No further cases developed and the four cases recovered without any residual paralysis. One peculiar symptom complained of by a number of these patients was a mild sore throat. Some authorities state that a number of cases of Poliomyelitis are missed due to the fact that the paralysis is so slight that it is overlooked and each angina or sore throat should be looked on with suspicion when an epidemic of Poliomyelitis is prevalent in a community.

Due to the fact that the early treatment of Poliomyelitis is symptomatic it was decided to give Dr. Rosenau's anti-Poliomyelitis serum an opportunity to prove its value if the local physician who had the cases under his control wished it. This serum was used in several cases in *Charles City* and one case at *Millersburg*. One case at Charles City upon which the serum was tried was a man 26 years of age who had a varying degree of paralysis not only of the lower but also of the upper extremities. The serum was without effect in this case for this patient died in three days after our visit. Several more cases of Poliomyelitis at Charles City were given the serum according to directions after that time. The doctor who reported the results to us from there stated that it was impossible to state that the serum did any good. The only results that he was definitely sure of was that in several cases a serum rash developed a few days after the administration of the serum.

The case of Poliomyelitis at Millersburg cleared up after the administration of serum. But it is impossible to state whether the serum had any affect upon the case or not, because many cases of Poliomyelitis recover from the paralysis merely upon symptomatic treatment anyway.

One trip was made to investigate a case reported as Poliomyelitis by a chiropractor. The investigation revealed that four physicians of that vicinity had prior to the date upon which the case was examined by the State Epidemiologist, examined the case and pronounced it not Poliomyelitis. The examination of the State Epidemiologist revealed the fact that this case did not have symptoms or physical findings for a case of Poliomyelitis and should not be kept under quarantine.

In not a one of these cases of Poliomyelitis was it possible to detect the original sources for these cases but it is quite probable that the healthy carrier plays a major part in the spread of this disease. There is not a practical method by which carriers can be detected and so the isolation of these individuals is out of the question. Prompt isolation and quarantining of cases together with prompt concurrent disinfection of discharges has proved to be the most efficient method of controlling the spread of this disease.

CHICKEN POX

Due to the similarity in character of the lesions of chicken pox and smallpox, there is many times considerable difficulty in making a differential diagnosis between the two diseases. Such a difficulty arose at Manchester and there was some difference of opinion in regard to the diagnosis. The State Epidemiologist, after examining the case in question made a diagnosis of chicken pox and so advised the local board.

Also at Wellman there was some question as to the diagnosis, chicken pox or smallpox since there was considerable smallpox in the surrounding country. The examination of all these cases revealed that they were typically chicken pox cases and were under proper isolation and placarding. To prevent the spread of contagious diseases, the State Board of Health of Iowa has made it possible by certain rules and regulations to quarantine all suspicious cases until the diagnosis has been definitely established. In this way mild and atypical cases of contagious diseases may be isolated and thus the health of the community is protected.

TABLE 11.—EXAMINATIONS MADE AT BRANCH LABORATORIES

Locality	Diphtheria		Typhoid		Tuberculosis		Miscellaneous		Total	
	1920-21	1921-22	1920-21	1921-22	1920-21	1921-22	1920-21	1921-22		
Ames	38	271	3	2	3	4	9	96	53	373
Carroll	0	48	1	0	2	0	62	82	65	130
Cedar Rapids	958	908	2	10	65	51	262	133	1,287	1,102
Creston	36	3	0	0	5	3	0	0	41	6
Des Moines	3,879	4,066	157	0	7	87	2,105	1,814	6,148	5,967
Dubuque	1,740	2,031	......	0	36	48	236	649	2,012	2,728
Ft. Dodge	440	1,063	31	29	47	58	......	1	518	1,151
Grinnell	166	218	......	10	18	24	39	33	223	285
Mason City	176	206	4	0	20	26	1,280	29	1,480	261
Sioux City	419	3,500	0	0	114	129	1,481	2,059	2,014	5,688
Total	7,852	12,314	198	51	317	430	5,474	4,896	13,841	17,691

V—RECORDS AND REPORTS DIVISION

Minnie Hamilton, Chief

The Division of Records and Reports was established as a division of the Laboratories of the State Board of Health, July 1, 1921, by Dr. Don M. Griswold, who took the directorship of the laboratories at that time. This division has been in charge of Minnie Hamilton since its establishment.

In this division records are kept of the transactions of the different divisions, including the Diagnostic, Wassermann, Epidemiological, and Water divisions.

At the present time the division has one chief clerk, one stenographer, and one stenographer and clerk. The work here increases in proportion to the work of the other divisions, it being practically a summary of the work of the other divisions.

The office space is rather limited at the present time, the chief clerk and the two stenographers being located in two offices in which are kept the letter files, card files, stationery and other necessary equipment.

TABLE NO. 9.—SUMMARY OF EPIDEMIOLOGICAL FIELD INVESTIGATION

Date	Type of investigation	Town or City	Disease	Probable mode of spread	By whom investigated
1920-21					
July 10	Field	Pella	Typhoid	Milk	Dr. Griswold
July 12	Laboratory, Spec. from	Pella	Typhoid	Water	Dr. Griswold
Sept. 1	Laboratory, Spec. from	Pella	Typhoid	Water	Dr. Griswold
Oct. 15	Field	Dubuque	Diphtheria		Dr. Griswold
Nov. 15	Field	Ottumwa	Smallpox	Contact	Dr. Griswold
Nov. 20	Field	Decorah	Smallpox	Contact	Dr. Griswold
Dec. 2	Field	Lamoni	Smallpox	Contact	Dr. Griswold
Dec. 22	Field	Lemars	Smallpox	Contact	Dr. Griswold
1921					
Jan. 22	Field	Toledo	Diphtheria	Contact	Dr. Griswold
Jan. 26	Field	Oakdale	Diphtheria	Contact	Dr. Griswold
April 1	Field and laboratory	Letts	Diphtheria	Contact	Dr Gris wold
April 7	Field and laboratory	Letts	Diphtheria	Contact	Dr. Griswold
April 8	Field	Brighton	Diphtheria	Contact	Dr. Griswold
April 12	Field	Allison	Scarlet fever		Dr. Griswold
April 28	Field	Granger	Smallpox		Dr. Griswold
May 2	Field	West Chester	Smallpox		Dr. Griswold
May 12	Field	Wellman	Chickenpox		Dr. Griswold
May 24	Field	Greeley	Meningitis		Dr. Griswold
May 20	Field	Littleport	Smallpox		Dr. Griswold
June 10	Field	Waterloo	Typhoid	Milk	Dr. Griswold
July 19 & 20	Field	Dunreath	Typhoid	Water	Dr. French
July 22- 3-16	Field and laboratory	Davenport	Diphtheria	Contact	Dr. French
Aug. 7, 8-13	Field and laboratory	Davenport	Diphtheria	Contact	Dr. French
Aug 13-16	Field	Webb	Poliomyelitis		Dr. French
Aug 24	Field	Greeley	Typhoid	Contact	Dr. French
Sept. 13, 14	Field	Fairbank	Typhoid	Water and ice	Dr. French
Sept. 21	Laboratory	Fairbank	Typhoid	Water and ice	Dr. French
Sept. 21	Field	Granger	Diphtheria	Contact	Dr. Griswold
Sept. 23	Field	Albia	Typhoid	Water	Dr. Griswold
Sept. 29	Field	Clarion	Diphtheria		Dr. French
Oct. 3	Laboratory	Toledo (Juvenile Home)	Diphtheria		Dr. French
Oct. 3 & 4	Field	Toledo (Juvenile Home)	Diphtheria		Dr. French
Oct. 4	Field	Essex	Poliomyelitis		Dr. French
Oct. 6 & 8	Field	Lehigh	Diphtheria and scarlet fever	Contact	Dr. French
Oct. 19 & 20	Field	Independence (State Hosp.)	Diphtheria		Dr. French
Oct. 20	Laboratory	Independence (State Hosp.)	Diphtheria		Dr. French
Oct. 25	Field	Douds, Leando, Selma	Diphtheria and scarlet fever	Water and contact	Dr. French
Oct. 26	Laboratory	Douds	Diphtheria		Dr. French
Oct. 27	Field	Nashua	Scarlet fever	Contact	Dr. French

TABLE NO. 9.—Continued

Date	Type of investigation	Town or City	Disease	Probable mode of spread	By whom sent
Nov 28	Field	Millersburg	Ant. Poliomyelitis		Dr. French
Dec. 7-9	Field	Keighley	Scarlet fever		Dr. French
Dec. 13-14	Field	Mt. Ivy	Scarlet fever		Dr. French
Dec. 14-15	Field	Mt. Union	Scarlet fever	Milk	Dr. French
Dec 15-16	Field	Walnut	Scarlet fever	Contact	Dr. French
1922					
Jan 3-9	Field	Independence (State Hosp.	Schick Test	Contact	Dr. French
Jan. 12	Field	Ackley	Diphtheria	Contact	Dr. Griswold
Jan. 16	Field	Ackley	Schick Test		Dr. Griswold
Feb. 9	Field	Ackley	Schick Test		Dr. French
Feb. 9	Field	Bedford	Smallpox	Contact	Dr. French
Feb. 16	Field	Vinton	Sanitation and Prev. Med		Dr. Griswold
Feb. 21	Field	Bedford	Smallpox	Contact	Dr. French
Feb. 21	Field	Prescott	Similar Dis. similar to dysentery		Dr. Griswold
Feb. 10-12	Field	Blockton	Smallpox	Contact	Dr. French
April 3	Field	Iowa City	Med. School inspection scarlet fever		Dr. French
April 4	Field	West Branch	Address Teachers Assoc., Chick. pox, etc.		Dr. French
May 17	Field	Lenox	Scarlet fever		Dr. French
June 15-17	Field	Mt. Pleasant	Diphtheria	Contact	Dr. French
June 19-22	Field	Mt. Pleasant	Diphtheria	Contact	Dr. French

Annual and Biennial Volume of Work Since Establishment of Laboratory

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	2d	17,189
4	July 1, 1907—June 30, 1908	8,856		
5	July 1, 1908—June 30, 1909	10,427	3d	22,981
6	July 1, 1909—June 30, 1910	12,554		
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	14,991	6th	40,480
12	July 1, 1915—June 30, 1916	25,795		
13	July 1, 1916—June 30, 1917	23,752	7th	46,880
14	July 1, 1917—June 30, 1918	29,128		
15	July 1, 1918—June 30, 1919	43,713	8th	129,705
16	July 1, 1919—June 30, 1920	85,980		
17	July 1, 1920—June 30, 1921	108,662	9th	298,978
18	July 1, 1921—June 30, 1922	190,316		

SUMMARY OF THE WORK OF THE BIENNIUM
Laboratories for the State Board of Health

	1920-21	1921-22	Summation	Total
I—Diagnostic Division—				
a. Outfits distributed	31,874	75,358	107,232	
b. Specimens received:				
Diphtheria	17,472	31,568	49,040	
Typhoid	1,681	1,841	3,522	
Tuberculosis	3,921	4,193	8,114	
Rabies	46	65	111	
Malaria	6	0	6	
Meningitis	12	32	44	
Miscellaneous	71	85	156	
Total	54,883	113,142	168,025	168,025
II Wassermann Division—				
a. Outfits distributed	17,342	27,979	45,321	
b. Specimens received:				
Blood	18,405	24,423	42,827	
Spinal Fluid	354	1,143	1,149	
Gonorrhea	1,145	2,209	3,354	
Total	37,246	55,753	92,999	92,999
III Water Analysis Division—				
Specimens received:				
a. Water	2,669	3,663	6,332	
b. Ice	3	22	25	
c. Sewage		7	7	
Total	2,672	3,692	6,364	6,364
IV Epidemiology Division—				
Investigations:				
Field	16	32	48	
Laboratory	2	4	6	
Field and Laboratory	2	2	4	
Total	20	38	58	58
V Branch Laboratories—				
Diagnostic:				
Diphtheria	7,852	12,314	20,166	
Typhoid	198	51	249	
Tuberculosis	317	430	747	
Miscellaneous	5,474	4,896	10,370	
Total	13,841	17,691	31,532	31,532
Grand total	108,662	190,316	298,978	298,978