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SIXTEENTH  
BIENNIAL REPORT  
*of the*  
Montana  
State Board of Health



*For the Years*  
1931-1932

Vital Statistics for the Years 1930-1931

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BIENNIAL REPORT  
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*For the Years*  
**1931-1932**

Vital Statistics for the Years 1930-1931



## STATE OF MONTANA

### State Board of Health

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W. F. Cogswell, M. D., Secretary and Executive Officer.....	Helena

### Division of Communicable Diseases

J. H. Crouch, M. D., Director.....	Helena
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### Division of Child Welfare

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Mrs. Florence B. Jordan, Assistant Acting Director.....	Helena

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### Hygienic Laboratory

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### Division of Food and Drugs

Jacob W. Forbes, Director.....	Helena
W. M. Cobleigh, Consultant.....	Bozeman

**STATE OF MONTANA**  
**STATE BOARD OF HEALTH**

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Helena, December 1, 1932.

Hon. John E. Erickson, Governor,  
Helena, Montana.

Sir:

In compliance with Section 2447, Revised Codes of Montana, 1921, I herewith hand you the sixteenth biennial report of the State Board of Health. In doing so I wish to thank you most heartily for your continued support in all public health work.

Yours very truly,

W. F. Cogswell, M. D.,  
Secretary.

## FOREWORD

W. F. Cogswell, M. D. Secretary.

The State Board of Health at its April, 1932, meeting, temporarily reduced the salaries of the employees 10 per cent to take effect July 1, 1932. This was to help meet a state-wide financial emergency. It is hoped that when the depression is past and conditions again become normal, that the salaries can again be put back on a pre-depression basis. Our employees have technical training and cannot be retained unless they receive adequate salaries. The overhead expense was further reduced by the secretary taking over the duties of the director of the child welfare division, where a vacancy had occurred. This was made possible on account of the fact that he was relieved of much of the work in connection with Rocky Mountain spotted fever control work and also health work on the Indian reservations.

In February, 1931, an appropriation was made by Congress to purchase the spotted fever laboratory at Hamilton. In February, 1932, the United States Public Health Service took over the laboratory and much of the control work.

In January, 1932, the Bureau of Indian Affairs appointed a Medical Director for this district, locating him in Helena. The State Board of Health appointed him deputy state health officer to act on the Indian reservations.

These two acts relieved the secretary of considerable work and he felt that for the time being he could dispense with the services of a director of the child welfare division.

The taking over of the laboratory at Hamilton by the United States Public Health Service and making it a branch of the National Institute of Health, was a milestone in public health work in Montana. This laboratory will serve the Rocky Mountain states in the production of vaccine for the prevention of Rocky Mountain spotted fever. In fact, the vaccine that is produced at this laboratory will no doubt be used in the eastern states where it has been recently proved that Rocky Mountain spotted fever exists and has existed for years. There is still much research work to be done on our Rocky Mountain wood tick and also on the eastern dog tick. In our biennial report for the years 1929-30 the following statement was made:

"We predict that in years to come many of the indefinite infections which have not yet been classified will be found to be due to the bite of the wood tick. There is much work to be done along these lines."

Much has been done since this was written but there is still a big field for investigational work. It appears to us that the life history of the eastern dog tick should be worked out as completely as is the life history of the ordinary wood tick. This eastern dog tick is found in some parts of Montana.

A full report on the Rocky Mountain spotted fever situation will be found in the 1932 report of the State Board of Entomology.

In 1929, Congress passed an Act making state sanitary laws applicable to the Indian reservations but subject to regulations to be promulgated by the Secretary of the Interior. The Secretary of the Interior was slow in promulgating his regulations and it was not until September, 1931, that such regulations were promulgated, and then only after the State Board of Health of Montana, in conference with the Indian Agents of the state, formulated suggestive regulations for Montana. These regulations were promulgated exactly as suggested. They provide for reservation health departments under the direct jurisdiction of the State Board of Health. A reservation board of health has been organized on the Blackfeet Reservation and is functioning efficiently. There has been a delay in organizing on the other reservations, due to the fact that suitable physicians have not been appointed by the Bureau of Indian Affairs with the assurance of any degree of permanency.

It is our opinion that the Indian Medical Service should be put under the United States Public Health Service. Until this is done we can only expect continued inefficiency in this work.

It is the intention of Dr. O. M. Spencer, Medical Director for Montana, to organize boards of health on all the Indian reservations as soon as possible.

### SCHOOL FOR WATER WORKS OFFICIALS

Mr. Foote, director of the water and sewage division, in his report mentioned the fact that a school for water works officials was established in the spring of 1932. The plan for this school was worked out in cooperation with the Dean of Engineering of the Montana State College. This school will no doubt result in an increase in the efficiency of water work in the state and will aid very materially in giving the people safe water supplies. The attendance at the first school was thirty-five very much interested officials. This school will be an annual affair and will be held just previous to the meeting of the Montana Branch of the American Water Works Association, and at the same place.

### APPLES

Ever since the operations in the Garden of Eden, problems connected with the eating of apples have from time to time arisen, but at this time in a somewhat different form.

Early in the fall of 1932 complaints came to the State Board of Health of illnesses which were apparently caused from eating apples. The food and drug division of the State Board of Health examined a series of samples of apples, both Montana grown and those sent in from other states. It was found that many of the apples and pears shipped into the state by trucks contained a heavy residue from

arsenical spray.—much above the federal tolerance. The office of Food and Drug Administration of the U. S. Department of Agriculture was called upon in this situation. After a conference with a representative of that office and the State Board of Health, it was decided to establish a laboratory at Missoula, Montana, to examine apples brought into the state by trucks. This laboratory operated in Missoula for about a week and then moved to the food and drug laboratory in the State Board of Health building in Helena.

In order to aid the federal authorities and prevent the sale of fruit containing an excessive amount of arsenical residue, the State Board of Health, on October 6, passed the following regulation:

"On and after October 17, 1932, the sale or possession with intent to sell, of apples or pears brought into the State of Montana by automobile truck or other similar conveyance, is hereby prohibited; provided, however, that the sale of such fruit may be made when accompanied by a certificate issued by the proper Federal authorities or the proper State authorities of the state in which the fruit was grown, stating that the said fruit had been thoroughly washed to remove arsenic or other poisons. This certificate shall also show the date and place of issue, the make, kind or type and capacity of conveyance, number of license plate and State issuing same, name of owner of conveyance, name of driver, and number of boxes of apples or lugs of pears.

Merchants having in their possession unwashed apples or pears from any other State on the date that this regulation becomes effective, may sell the same only after such fruit has been washed under the supervision of the local or county health officer."

This regulation will probably have to be modified to include not only truck shipments but those shipped in by rail.

We wish to give credit to the Horticultural Division of the State Department of Agriculture for the valuable aid given us in the collection of samples. Without this aid the work would not have been nearly as effective.

A full report of the work that has been done along these lines will be found in the report of the food and drug division.

#### TAPEWORM AS A PUBLIC HEALTH PROBLEM

In November, 1929, Dr. W. J. Butler, state veterinarian, notified the health department that of 125 head of cattle which had been fed in Missoula County and shipped to Portland, 97 were found, upon slaughtering, to be affected with *cysticercus bovis*. Dr. F. D. Pease, full-time health officer of Missoula County, and Dr. H. M. Schultz, deputy state veterinarian, made an investigation and Doctor Pease made the following report:

"Upon investigation it was found that the cattle in question were fed upon beet tops at a ranch west of Missoula. It was further found by a visit to the ranch with Doctor Schultz that most of the cultivation of the beets was done by a Mexican family which was housed in a shack near the beet field. The toilet used by the family was located over an irrigation ditch. Examination of the feces of the toilet and members of the family showed eggs of the *Taenia Saginata* in the toilet and in the feces of the father of the family. A few days later twelve head of cows which had been fed in the same field as the cattle which were shipped to Portland, were slaughtered at Missoula and seven head were found to be affected with cysticercosis."

Doctor Pease had the toilet removed from the irrigation ditch and successfully treated the Mexican for tapeworm.

In April and May, 1932, further reports were received that a considerable percentage of cattle shipped from western Montana to the Spokane market were affected with this disease. On investigation it was found that these cattle were fed on beet tops before marketing.

It was decided by the State Board of Health and the Livestock Sanitary Board that there was a public health question involved as well as an economic question which concerned the stockmen. The value of beef infested with cysticerci was affected, and, of course, there was the danger of humans developing tapeworm from eating such meat when it was not properly cooked.

Several meetings were held in the beet raising areas and talks were made to the farmers by the state veterinarian and a representative of the State Board of Health. A man was employed to interview each of the beet raisers, advocating the establishment of temporary toilets convenient to the beet workers. It seems that many of the Mexican beet workers are infested with tapeworm. There was an excellent response on the part of the beet raisers and it hoped that this trouble has been eliminated.

At this time your attention is called to the detailed reports of the heads of the various divisions which are included in this report.

In spite of drought and depression the health of the people, as far as communicable diseases go, has never been better. Perhaps this may be in part due to the spirit of helpfulness that prevails. There has never been a time, as far as we know, when people have been so willing and anxious to help their neighbors. We may get something of value out of this depression.

The State Board of Health wishes at this time to recognize the valuable work done by the local and county health officers, although many of them were not properly paid. Without such cooperation a well-rounded public health program could not be made effective.

### OUTSTANDING EVENTS

During the last biennium the outstanding events from a public health administration standpoint are—

- First, The establishment at Hamilton, Montana, of a branch of the National Institute of Health.
- Second, The establishment of a school for water works officials.
- Third, The organization of Indian Reservation health boards under the direct jurisdiction of the State Board of Health.
- Fourth, The prevention of the sale of apples and pears containing an undue amount of arsenical spray residue.
- Fifth, The recognition of tapeworm as a public health problem.
- Sixth, The passage of a law requiring water well drillers to register with the State Board of Health and furnish logs of all wells drilled.

## BIENNIAL REPORT OF THE DIVISION OF COMMUNICABLE DISEASES

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By J. H. Crouch, M. D., C. P. H., State Epidemiologist

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In the control of communicable diseases, it is fundamental that the health authorities must have knowledge of the cases. Restrictive measures such as isolation and quarantine are of little value in stamping out an epidemic, if they are applied to only a part of the cases. A continued effort has been made by this department during the past two years to secure more complete reporting of cases. In the so-called minor diseases, which are frequently so mild that the family physician is not consulted, we must depend on the parent or school teacher to make the report. This has been repeatedly called to the attention of the teachers and the public in general. A special bulletin has been prepared and distributed to all teachers in the state, giving detailed information about diseases liable to occur among school children and urging prompt removal of suspected cases from school.

A major problem in the accurate recording of cases at the State Board of Health has been the receiving of regular weekly reports from county and local health officers. In our last **Biennial Report**, it was stated that prior to 1929 not more than twenty-five per cent of the health officers reported each week, and that in 1929 and 1930 about thirty per cent reported. It was mentioned that one of the needs was an amendment to the law covering this matter. The law was amended in February, 1931, and later in the year changes in method were developed, which made it much easier for the local men to send in their reports. A weekly summary for the entire state is prepared by this department and sent to each health officer. This summary gives the number of cases of each disease occurring in the different jurisdictions, and mentions those who have failed to send in any report. During recent months, more than eighty per cent of the county and local health officers have reported each week. Between ten and fifteen per cent report fairly well, and only four or five are still hopelessly negligent.

During the period covered by this report, the routine visits to county and local health officers have continued, and, at their request or when it seemed desirable, many special visits and investigations have been made. These investigations are listed in the following table.

## SPECIAL INVESTIGATIONS

	1930	1931	1932
			(10 mos.)
Typhoid Fever.....	2	1	5
Smallpox .....	4	2	2
Diphtheria .....	4	..	..
Septic Sore Throat.....	1	..	1
Scarlet Fever.....	6	3	2
German Measles.....	1	..	..
Meningococcic Meningitis.....	1	..	..
Poliomyelitis .....	2	..	..
Gonorrhea .....	1	..	..
Syphilis .....	1	..	2
Infectious Jaundice.....	..	1	..
Botulism .....	..	..	1
Gastro Enteritis.....	2	..	..
Psittacosis .....	1	..	..
Trachoma .....	1	..	..
Skin Infections.....	..	..	1
Miscellaneous (not communicable disease).....	..	2	..
Routine visits to health officers.....	65	29	70

## BIOLOGICALS

The following biologicals for immunization campaigns have been purchased through the State Board of Health by local health officers and others. Amounts are expressed in number of immunizations.

## BIOLOGICALS DISTRIBUTED

	1930	1931	1932
			(10 mos.)
Smallpox Vaccine.....	2310	3881	2985
Typhoid Vaccine.....	216	312	473
Toxin-Antitoxin .....	1670	440	70
Toxoid .....	795	8970	6570
Scarlet Fever Toxin.....	.....	.....	720

## EXPERIMENT IN IMMUNIZATION OF INFANTS

It had been frequently suggested to the State Board of Health that, as a part of our regular program, we should send notices to mothers in the state when their babies are six months old, advising them to have the babies immunized against diphtheria and smallpox. In order to test the effectiveness of such a procedure, we decided to try it out on a small scale, and four representative counties were chosen for the experiment. The counties selected were Chouteau, Custer, Dawson, and Flathead. After explaining the purpose of the experiment to the physicians in these counties and securing promises of cooperation from most of them, we began to send notices to the mothers in March, 1932, and continued for four months.

There were 263 mothers thus notified, and thirty-one of the forty-six doctors replied to our questionnaire. A total of five babies were immunized. Three of these were by a physician in Custer County, who was just completing a campaign of free immunization, and the work was done without charge. Two other children, one in Custer and one in Flathead, were immunized as private patients.

The cost of the experiment to the State Board of Health was at least twenty dollars, including stationery, postage, and clerical work. The results accomplished, or at least the immediate results, were very disappointing, although some physicians expressed the opinion that sufficient interest in immunization had been created to more or less justify the experiment.

#### **ADDITIONS TO THE LIST OF REPORTABLE DISEASES.**

During the biennium, the State Board of Health added undulant fever and psittacosis to the official list of reportable diseases.

#### **COMMUNICABLE DISEASES REPORTED.**

In the following tables are listed by months the number of cases of communicable diseases recorded by the State Board of Health. Most of the cases were reported through county and local health officers. In some, the information was obtained from death certificates, and in others from the records of special investigations.

**COMMUNICABLE DISEASES REPORTED DURING THE YEAR 1930**  
**Including Deaths From Communicable Diseases Not Previously**  
**Reported as Cases**

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Tuberculosis .....	52	47	39	38	35	51	61	47	56	41	36	31	534
Typhoid Fever .....	1	9	10	6	3	6	11	13	39	13	6	6	123
Smallpox .....	14	43	65	58	17	17	9	11	...	6	24	85	379
Diphtheria .....	9	3	6	13	5	2	3	3	6	8	11	8	77
Septic Sore Throat .....	1	...	2	1	...	4	...	...	1	...	4	1	14
Scarlet Fever .....	182	173	194	153	111	67	56	32	57	71	132	141	1355
Measles .....	100	132	118	92	81	82	46	14	5	5	10	9	664
German Measles .....	5	6	5	1	3	...	...	...	...	...	3	2	28
Whooping Cough .....	13	21	38	36	36	52	296	87	79	88	111	122	979
Chickenpox .....	65	41	53	50	42	21	16	11	28	187	280	237	1034
Mumps .....	515	525	550	262	165	46	17	26	12	28	61	88	2295
Influenza .....	16	42	47	21	8	1	3	5	3	10	11	13	159
Epidemic Meningitis .....	9	9	13	8	1	1	5	3	3	3	1	3	62
Polioomyelitis .....	...	...	1	...	1	3	2	1	3	6	3	...	20
Encephalitis .....	4	...	1	1	2	...	...	...	...	1	1	1	11
Rocky Mountain Spotted Fever .....	...	...	...	6	5	5	4	...	...	...	...	...	20
Tularemia .....	...	...	...	...	1	2	1	...	...	...	...	2	3
Tick Paralysis .....	...	...	...	...	1	1	...	...	...	...	...	...	4
Undulant Fever .....	1	...	...	...	1	1	...	1	...	...	...	...	4
Erysipelas .....	4	3	10	3	6	5	2	3	1	3	3	7	50
Trachoma .....	2	...	...	...	...	...	...	...	8	3	1	55	69
Ophthalmia Neonatorum .....	...	...	...	...	1	...	2	...	...	1	...	...	4
Gonorrhea .....	11	22	18	8	7	13	21	32	33	30	27	48	270
Syphilis .....	14	18	25	24	20	22	27	41	53	55	46	62	467
Psittacosis .....	2	...	...	...	...	...	...	...	...	...	...	...	2
Dysentery .....	...	...	...	...	...	...	2	...	17	...	...	1	20
Tetanus .....	...	...	...	...	...	...	...	...	...	...	1	...	1
Cancer .....	...	1	3	...	...	4	1	5	...	...	2	1	17
Other Diseases .....	...	...	...	...	...	...	4	1	3	2	4	1	15

**COMMUNICABLE DISEASES REPORTED DURING THE YEAR 1931**

**Including Deaths From Communicable Diseases Not Previously  
Reported as Cases**

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Tuberculosis .....	36	45	64	82	48	27	62	34	42	41	53	45	579
Typhoid Fever .....	3	6	6	5	5	19	14	11	29	21	11	4	131
Smallpox .....	27	13	19	12	4	14	8	4	3	1	6	18	129
Diphtheria .....	19	8	14	10	7	3	2	7	11	2	18	4	105
Septic Sore Throat .....	3	4	5	2	2	8	3	3	1	1	4	7	39
Scarlet Fever .....	243	196	106	139	80	26	22	44	33	45	127	162	1223
Measles .....	18	10	21	93	70	58	54	37	43	118	571	541	1631
German Measles .....	2	6	22	31	31	7	4	2	1	2	8	4	120
Whooping Cough .....	199	165	173	135	97	58	58	45	40	49	60	48	1127
Chickenpox .....	165	109	126	227	167	65	34	11	31	80	174	181	1370
Mumps .....	138	161	196	111	80	43	2	11	1	4	4	10	731
Influenza .....	25	44	132	52	31	7	3	4	6	10	11	14	339
Pneumonia .....	1	3	3	4	6	4	1	4	3	2	7	6	48
Epidemic Meningitis .....	4	3	3	4	6	4	1	4	1	1	2	2	31
Poliomylitis .....	1	1	1	1	1	2	4	11	19	7	8	5	58
Encephalitis .....	1	2	1	1	1	1	1	1	1	2	1	1	7
Rocky Mountain Spotted Fever .....	1	1	1	11	10	3	3	2	1	1	1	1	34
Tularemia .....	1	1	1	1	1	1	1	1	1	1	1	1	3
Tick Paralysis .....	1	1	1	1	1	1	1	1	1	1	1	1	1
Erythema .....	1	1	1	1	1	1	1	1	1	1	1	1	1
Erysipelas .....	9	7	4	3	4	4	3	3	4	3	1	6	45
Trachoma .....	2	2	128	28	3	3	3	49	24	1	2	1	210
Ophthalmia Neonatorum .....	1	1	1	1	1	1	1	1	1	1	1	1	2
Gonorrhea .....	22	26	45	23	24	14	24	38	31	28	23	33	331
Syphilis .....	46	32	39	39	46	26	37	48	37	38	56	40	504
Dysentery .....	1	1	1	1	1	1	1	3	3	3	1	1	13
Silicosis .....	1	1	1	1	1	1	1	1	1	1	1	1	13
Actinomycosis .....	1	1	1	1	1	1	1	1	1	1	1	1	1
Anthrax .....	1	1	1	1	1	1	1	1	1	1	1	1	1
Cancer .....	1	3	1	1	5	3	4	2	2	2	3	2	27
Other Diseases .....	2	2	8	6	9	4	1	6	2	1	14	8	60

# **COMMUNICABLE DISEASES REPORTED FROM JANUARY TO OCTOBER, INCLUSIVE, 1932**

Including Deaths From Communicable Diseases Not Previously  
Reported as Cases

	Jan.....	Feb.....	March.....	April.....	May.....	June.....	July.....	Aug.....	Sept.....	Oct.....	Nov.....	Dec.....	Total.....
Tuberculosis .....	54	32	55	72	62	39	56	49	43	38	.....	.....	.....
Typhoid Fever .....	8	3	8	8	8	7	12	23	24	22	.....	.....	.....
Smallpox .....	10	5	12	20	14	33	20	17	12	12	.....	.....	.....
Diphtheria .....	11	8	12	7	1	5	3	1	5	1	.....	.....	.....
Septic Sore Throat .....	13	4	9	6	1	2	12	13	4	3	.....	.....	.....
Scarlet Fever .....	161	183	148	55	62	24	25	20	39	43	.....	.....	.....
Measles .....	181	295	498	486	411	379	85	202	131	506	.....	.....	.....
German Measles ....	4	3	.....	2	1	3	2	1	7	1	.....	.....	.....
Whooping Cough .....	41	50	81	37	46	52	216	108	123	21	.....	.....	.....
Chickenpox .....	154	73	72	116	94	51	30	3	32	161	.....	.....	.....
Mumps .....	9	21	26	34	46	30	22	1	2	16	.....	.....	.....
Influenza .....	452	574	972	46	25	14	3	8	11	26	.....	.....	.....
Pneumonia .....	5	15	15	5	9	2	7	10	2	4	.....	.....	.....
Epidemic Meningitis .....	2	3	2	2	2	.....	2	1	1	2	.....	.....	.....
Polionmyelitis .....	2	1	3	.....	1	.....	.....	.....	1	.....	.....	.....	.....
Encephalitis .....	.....	.....	2	.....	.....	1	1	1	2	.....	.....	.....	.....
Rocky Mountain Spotted Fever .....	.....	.....	1	11	46	27	11	2	1	1	.....	.....	.....
Tularemia .....	.....	.....	.....	.....	2	3	.....	2	3	.....	.....	.....	.....
Tick Paralysis .....	.....	.....	.....	.....	2	1	.....	.....	.....	1	.....	.....	.....
Undulant Fever .....	.....	.....	1	.....	.....	3	3	.....	.....	1	.....	.....	.....
Erysipelas .....	4	2	3	2	3	1	12	1	2	4	.....	.....	.....
Trachoma .....	1	.....	8	12	6	.....	.....	.....	.....	6	.....	.....	.....
Gonorrhea .....	22	18	38	21	22	41	72	27	41	32	.....	.....	.....
Syphilis .....	36	33	68	34	58	52	72	53	60	36	.....	.....	.....
Psittacosis .....	.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	.....
Dysentery .....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silicosis .....	1	.....	1	7	2	1	2	4	2	4	.....	.....	.....
Actinomycosis .....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Anthrax .....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cancer .....	2	2	4	5	2	4	1	47	3	4	.....	.....	.....
Other Diseases .....	16	78	45	33	23	12	53	15	26	86	.....	.....	.....

**Typhoid Fever.** During the past five or six years, the prevalence of typhoid fever has been remarkably constant, except for the epidemic in Helena in 1929. Between 115 and 135 cases are reported each year.

The one factor which continues to be very important in causing infection is the persistent habit among the people of Montana of drinking surface water. The irrigation districts along the Yellowstone River and the Milk River continue to have a large number of cases of typhoid fever, and we almost invariably obtain a history of drinking water from irrigation ditches. Throughout the state, campers and vacationists persist in drinking water from streams. Many warnings have been issued by the State Board of Health, calling attention to the dangers of drinking surface water and urging the use of typhoid vaccine before going on camping trips, but little heed seems to be paid to the warnings.

In Helena, following the epidemic of 1929 it was expected that sporadic cases would occur from time to time, due to the increased number of carriers left in the city by the epidemic. These expected cases have not developed. In fact, not a single case was reported among the residents of Helena until August, 1932. During the past three months, three cases have occurred in Helena. In two of these cases, trips had been made out of town just prior to the illness, and the exact source of infection could not be learned. In the third case, however, it was definitely established that the patient had for some time eaten food prepared by a person who had typhoid in 1929. This cook proved upon examination to be a typhoid carrier, and was probably the source of the patient's infection. A possible explanation of the lack of cases in Helena during the past few years is that more than ninety per cent of the people were immunized with vaccine at the time of the epidemic. This immunization usually lasts about three years.

Investigations of typhoid outbreaks in other sections of the state have resulted in the discovery of several additional carriers. One was found in Sanders County, one in Gallatin County, one in Prairie County and one in Pondera County.

Following an attack of typhoid fever, at least five per cent of the patients become carriers and continue to discharge typhoid germs for the rest of their lives. When single cases of the disease occur and no source of the infection can be determined it is usually due to infection from a carrier. Quite a number of carriers have been discovered when investigating sources of cases. They are warned of the danger of infecting others and are not allowed to handle food or milk commercially. Since they cannot be isolated for the rest of their lives it is very important that some method should be adopted for keeping in touch with them. This is a very difficult problem and no scheme has as yet been devised which is entirely satisfactory. The most successful plan is to offer the carriers a small

subsidy under the condition that they keep the health authorities informed of their location and activities, and send in specimens for examination every six months. It is recommended that an amount sufficient for this purpose be included in the budget of the State Board of Health.

**Smallpox.** The number of reported cases of smallpox has continued to drop sharply from the peak in 1928, when nearly 1,000 cases were reported. In 1929, there were 547 cases; in 1930, 379 cases; in 1931, 129 cases; and in 1932, 135 cases. In previous reports from this department it has been said that an unduly large proportion of our smallpox cases occur in Silver Bow County, or that the source of infection could be traced to this area. Infection seemed to be brought in from time to time by the migratory element of the population. As a result of the depression, the influx of transient workers has diminished markedly, and this quite possibly explains the reduction in smallpox.

**Diphtheria.** This disease continues its general downward trend, and the year 1932 promises to have the lowest number of cases in the history of the State Board of Health. A peculiarity in the record of diphtheria in Montana is that in recent years approximately one-half of the deaths have been in patients more than forty years of age.

**Scarlet Fever.** As in the rest of the country, the incidence of scarlet fever in Montana continues high, although there has been a slight reduction in the first ten months of 1932. Most of the cases are very mild, and many of them are not seen by physicians. For this reason, it is probable that many unreported cases have occurred, and, since the control of the disease depends largely upon strict quarantine of cases, this probably explains the continued high incidence.

In several places in the state where scarlet fever has persisted in a school or a community, the health authorities have immunized the children by the five-dose toxin method and have been successful in stamping out the disease. Such a program was carried out in the upper part of Lake County in January, 1932. In the area including Charlo, Pablo, Ronan, and Round Butte, scarlet fever had been endemic for several years. In November and December, 1931, the disease reached epidemic proportions and continued to spread in spite of the most rigid quarantine of recognized cases. The interest of the people in the community became thoroughly aroused and they decided to put on a campaign of immunization. The school authorities agreed to pay for the materials and Dr. E. J. French, the local health officer, donated his services. Three hundred fifteen individuals were immunized, most of them being children of school age. Doctor French, in his report of the work, was very enthusiastic about the results accomplished. Immediately following the im-

munizations there was a sharp drop in the number of cases occurring; in fact, there were only a few cases, all of them being in children who had not been immunized, and then the disease died out completely in the community.

A similar program of immunization was conducted in Pondera County by Dr. C. D. Powell, county health officer, and excellent results were obtained there, also.

**Measles.** As predicted in the last **Biennial Report**, the number of measles cases was high in 1932. The rise began in November, 1931, and has continued up to the present. It is expected that during the next few months the epidemic will subside and this will be followed by a year or more of low incidence.

**Whooping Cough.** Whooping Cough continues to be our most serious communicable disease. It causes more deaths than any other except influenza. The seriousness of whooping cough is not generally recognized, but it is extremely fatal in infancy. Whooping cough and measles cause more deaths in Montana than all other acute contagious diseases combined, excluding influenza. Ninety per cent of the deaths are in infants.

The four diseases, measles, whooping cough, chickenpox, and mumps, are often spoken of as the communicable diseases of childhood. A majority of the cases are mild and few of them are seen by physicians. In these diseases, we must depend largely upon reports by parents or school teachers, both of whom are legally required to report cases which are not seen by physicians. An attempt was made to estimate the proportion of cases reported by comparing the records of the four counties which have full-time county health officers with the other fifty-two counties in the state. It was found that about three times as many cases per thousand population were reported in the four counties with full time health officers. If we consider that reporting in these four counties is seventy-five per cent complete, this means that not more than one-fourth of the cases occurring elsewhere in the state are ever reported.

**Meningococcic Meningitis.** This disease continues to decline sharply. The peak was in 1928, when 177 cases occurred. In the ten months of 1932, only 17 cases have been reported.

**Poliomyelitis.** Infantile paralysis has been a serious problem all over the country for some years. Epidemics, either country-wide or confined to certain areas, have occurred each year. In 1930 there were only 20 scattered cases in Montana. In 1931 the number rose to 58 cases. For the ten months of 1932 there have been reported only 8 cases.

**Rocky Mountain Spotted Fever.** Following a five-year period of steady decline, there was a considerable increase in the number

of cases in 1932, when 101 cases were reported. Five of these were infected outside of the state and brought in for treatment. Eighteen of the Montana-infected cases died and there was one death in the out-of-state infections.

**Tuberculosis.** The reporting of cases of tuberculosis to the health authorities has always been very inadequate. Many patients do not consult a physician until they are in the late stage of the disease. Because of this and other reasons, it is considered that the record of deaths from tuberculosis is a much more reliable index of the amount of the disease present in a community than is the number of cases reported.

A study has been made of the deaths from tuberculosis reported in the state during the five-year period 1926-1930, inclusive, and many interesting points in connection with the disease have been brought out. Our total death rate from tuberculosis in 1931 was 60 per hundred thousand population. This is considerably less than the rate for the country as a whole. A study of the death certificates shows very plainly that we have two major problems, the Indians and the quartz miners. There were 494 deaths among the Indians, giving them an average annual death rate of 660 per 100,000, or more than ten times that of the state as a whole. Of these deaths, 177, or approximately 35 per cent, were in children under fifteen years of age.

The quartz miners have an average annual death rate of 661, or about equal that of the Indians. A rather remarkable point in connection with tuberculosis among miners is that there seems to be very little contact infection, especially in children. In Silver Bow County during the five-year period, there were 555 deaths from tuberculosis. In 398 of them the occupation was given as that of quartz miner. There were 105 other adult males and forty adult females. Only 12, or about two per cent of the total deaths, were children under fifteen years of age. The rest of the state, excluding Indians and quartz miners, has an average annual death rate of only 28 per hundred thousand, which is a very favorable record.

There has been much interest in tuberculosis during the past two years, and quite a number of surveys have been made, especially of school children. The Indian Medical Service has become very much interested in the question and, with the cooperation of the State Board of Health, has made extensive tuberculosis surveys of the school children on six of the Indian Reservations in Montana. The white children were included in the surveys.

The results of these surveys have been published in three papers, those by Dr. H. J. Warner, and Dr. W. G. Richards in the American Review of Tuberculosis, and one by Dr. J. H. Crouch in the U. S. Public Health Reports.

In two counties, McCone and Phillips, similar surveys of tuberculosis among school children have been made by local physicians and nurses. The State Board of Health assisted in the McCone County survey. Complete records of these two surveys are not yet available.

**Psittacosis.** In the last Biennial Report it was mentioned that two cases of psittacosis had occurred in the state in January, 1930. During the past two years the disease has increased in frequency in many sections of the country, but no further cases were reported in Montana until October, 1932, when one case occurred in Fallon County. Investigation of this case showed that infection was received from love birds. A booth which was operated in connection with a street carnival gave pairs of love birds as prizes and many of these birds were sick. The carnival company had come to Baker from Sidney where it had been one of the attractions at the Richland County Fair. While in Sidney a new shipment of birds was received from a dealer in California and it is believed that the infection was in this shipment, since sickness among the birds appeared immediately afterward. One suspected human case occurred at Sidney, but the disease was so mild that a definite diagnosis could not be made.

**BIENNIAL REPORT OF THE BUREAU OF VITAL STATISTICS  
FOR THE YEARS 1930 to 1931.****L. L. Benepe, Deputy State Registrar.****HIGH LIGHTS OF THE 1930 AND 1931 VITAL STATISTICS.**

- 1930. The Infant Mortality Rate (57.0) Lowest in History.
- 1930. Diphtheria (4 Death and 0.7 Rate Per 100,000) Lowest in History.
- 1930. Influenza Death Rate (19) Lowest Since 1924.
- 1930. Suicide Rate (25.3) Highest in History.
- 1930. Homicide Rate (10.6) Highest Since 1918.
- 1930. Total Communicable Disease Rate (131.1) Lowest in History.
- 1931. The Death Rate (9.8) Lowest Since 1925.
- 1931. The Birth Rate (17.9) Lowest Since 1910.
- 1931. The Tuberculosis Rate (60.6) Lowest In History.
- 1931. Small Pox. Second Year in History There Were No Deaths.
- 1931. Typhoid Death Rate (2.2) Lowest in History.
- 1931. Measles (2 Deaths) (0.4 Rate) Second Lowest in History (In 1922 There Were No Deaths from Measles).
- 1931. Auto Accident Rate (24.2) Second Highest in History.
- 1931. Apoplexy Rate (68.1) Highest in History.
- 1931. Alcohol Rate (13.2) Highest Since 1917.

**CREATION.** The Bureau of Vital Statistics was created by the legislature of 1907 and became effective June 1st of that year. It was created for the complete and proper registration of births and deaths, for legal, sanitary, and statistical purposes. The Bureau was placed under the superintendent of the Secretary of the State Board of Health, who is State Registrar.

**FUNCTION.** It is the function of the Bureau of Vital Statistics to promote the accurate and complete registration of the birth and death records, to properly index, file, and preserve them, to furnish certified copies of any records, to supply the Census Bureau of Washington, D. C. with transcripts, to tabulate and study the records, so that they may be of the greatest possible value in improving health conditions in the State, and to forward to all parents a birth notification stating that their baby's birth is properly recorded in the files of the State Board of Health. Included with this notification is the bulletin "Infant Care."

**ORGANIZATION.** The health officer of each city or town is local registrar for his immediate district and when it may appear necessary the State registrar is authorized to appoint any suitable person to act as sub-registrar for a district. Any justice of the peace

is required to act as local registrar when requested to do so by the state registrar.

The duties of the local registrar are to collect the birth and death records for his district from the person responsible for filing them. (Physicians, Midwives and Morticians) and to check his district at regular intervals to ascertain if all births and deaths occurring are properly filed. On or before the 5th day of each month he must transmit to the State Registrar the original birth and death records collected by him for the preceding month, and duplicate records must be filed with the Clerk and Recorder of the county in which the birth or death occurs. The local registrars compensation is twenty-five cents for each certificate filed with the State Registrar, which amount is certified to at the end of each year, by the State Registrar to the Treasurers of the various counties.

At the present time there are 105 local registrars in Montana, whose names and addresses are as follows; The names are listed in alphabetical order of the counties in which they reside.

Name	Address	Name	Address
Dr. F. M. Poindexter	..... Dillon	Dr. E. G. Wilcox	..... Drummond
Dr. W. A. Russell	..... Hardin	Mrs. Margaret J. Allen	..... Havre
Dr. Otto N. Schudd	..... Crow Agency	Miss Rose O'Connell	..... Rocky Boy
Mr. Herman Kuper	..... Chinook	Mr. J. E. Wild	..... Boulder
Dr. W. N. Deatherage	..... Harlem	Mr. S. H. Wolverton	..... Whitehall
Mrs. Caroline H. Linden	..... Fort Belknap	Dr. A. E. Myrick	..... Stanford
Dr. R. G. Bayles	..... Townsend	Dr. J. L. Richards	..... Polson
Dr. T. J. Benson	..... Fromberg	Mr. M. M. Twichel	..... St. Ignatius
Dr. E. M. Adams	..... Red Lodge	Dr. Wm. Copenhagen	..... Helena
Dr. G. F. Tidyman	..... John	Mr. E. M. Mack	..... Augusta
Dr. J. E. Midgett	..... Bridger	Dr. L. E. Lande	..... Chester
Dr. B. B. Sandy	..... Lakota	Mrs. Ethel Long	..... Eureka
Mrs. Nellie A. Wallace	..... Ridge	Dr. C. J. Martin	..... Libby
Mrs. M. E. Drebert	..... Boyes	Mrs. Anna Storm	..... Circle
Mrs. Lolo Z. Burch	..... Ridgeway	Dr. R. H. Dyer	..... Sheridan
Mrs. Alice King	..... Alzada	Dr. D. E. Clancy	..... Ennis
Dr. F. L. Watkins	..... Great Falls	Miss Dorothy Johnston	..... White Sul. Sp.
Dr. Gaylord Worstell	..... Big Sandy	Dr. W. J. Doyle	..... Superior
Dr. F. L. Anderson	..... Fort Benton	Dr. F. D. Pease	..... Missoula
Mrs. J. M. Koetelda	..... Hopp	Dr. C. T. Pigot	..... Roundup
Dr. Sadie Lindeberg	..... Miles City	Dr. S. E. Leard	..... Livingston
Dr. G. H. Cray	..... Ismay	Miss May Ventver	..... Winnett
Dr. D. B. Healy	..... Flaxville	Dr. Geo. W. Setzer	..... Malta
Mr. R. Hauge	..... Scooby	Dr. W. L. DuBois	..... Conrad
Dr. M. G. Danskin	..... Glendive	Dr. C. D. Powell	..... Valier
Dr. F. J. Malloy	..... Anaconda	Dr. Paul P. Halleck	..... Broadus
Dr. C. E. K. Vidal	..... Galen	Mr. Albert Bien	..... Deer Lodge
Mr. E. E. Dickerson	..... Warm Springs	Mr. Leon B. Clark	..... Mildred
Dr. W. H. Blakemore	..... Baker	Mr. R. V. Norris	..... Terry
Mr. Wm. Salmon	..... Westmore	Mr. N. C. Folger	..... Marsh
Dr. Hazel Freed	..... Grass Range	Dr. Herbert Hayward	..... Hamilton
Dr. C. C. Wallin	..... Lewistown	Dr. W. P. Reynolds	..... Stevensville
Mr. W. E. Jones	..... Roy	Dr. A. M. Treat	..... Fairview
Dr. W. L. Kell	..... Columbia Falls	Mr. Chas. Gordon	..... Wolf Point
Dr. W. S. Little	..... Kalispell	Miss Eloise Billings	..... Poplar
Dr. A. T. Lees	..... Whitefish	Dr. Guy T. Haywood	..... Forsyth
Dr. A. D. Brewer	..... Bozeman	Mrs. Elizabeth Rowland	..... Lame Deer
Mr. N. M. Kvalnes	..... Three Forks	Dr. E. S. Coats	..... Plains
Mr. C. F. Wilson	..... Jordan	Dr. Arthur Hampton	..... Noxon
Mr. Sam R. Wason	..... Wason Flats	Dr. A. W. Rew	..... Thompson Falls
Mr. Walter Pollard	..... Benzie	Mr. A. J. Urquhart	..... Dooley
Dr. H. F. Schrader	..... Browning	Mr. C. W. Mills	..... Outlook
Dr. P. O. Neraal	..... Cut Bank	Mr. C. N. Rostad	..... Westby
Mr. H. G. Jacobson	..... Ryegate	Mr. Ed Stubben	..... Medicine Lake
Dr. A. C. Knight	..... Philipsburg	Mr. J. G. Debing	..... Plentywood

Name	Address	Name	Address
Dr. J. J. Kane .....	Butte	Mr. Chas. E. Peterson .....	Glasgow
Mrs. Alice McColley .....	Columbus	Dr. T. L. Cockrell .....	Hinsdale
Mr. J. A. Lowry .....	Big Timber	Dr. E. M. Gans .....	Harlowton
Dr. H. W. Bateman .....	Choteau	Dr. G. E. Keller .....	Wibaux
Dr. M. D. Riddle .....	Shelby	Dr. E. G. Balsam .....	Billings
Mrs. Eva Merritt .....	Sweet Grass	Dr. E. C. Hall .....	Laurel
Dr. F. M. Alexander .....	Hysham	Mr. J. E. Essington .....	Broadview

**NECESSITY.** In countless ways the keeping of accurate records of the two most important events in the lives of people is proving of great importance for social, political, economic and health benefits of the citizens. A certified copy of a birth record may be necessary to prove any of the following facts, regarding an age, place of birth, for passports, school or labor permits, compensation, marriage, inheritance, voting, misdemeanor or citizenships, while a death record will prove fact and cause of death for insurance, estates, inheritance or compensation. The research work in the Bureau of Vital Statistics, i. e. the number of times the records were searched and information sent out amounted to 5603 times in 1930 and 5794 times in 1931. We have no figures on the number of times the various County Clerk and Recorders are requested for such information, but we are sure the total requests would approximate these figures for the state office.

**ACCURACY.** Montana was admitted to the United States Registration Area for deaths in 1910. That year we proved to the Federal authorities that we were registering over 90% of the deaths occurring in the State. Satisfactory birth reporting was not reached until about 1919. In 1921 the Census Bureau tested our accuracy of birth reporting and found that we were recording 93.4% of the births occurring and we were accordingly admitted as the 24th State to the Birth Registration Area on January 1 1922.

Checks made by this office since then indicate that we are now receiving over 98% of the deaths and 95% of the births occurring in the State.

The United States Death Registration Area in 1931 embraced all States except Texas (but included 8 Texas cities) and is estimated to include 96.3% of the total population of the country, while the Birth Registration Area included all the States, except Texas and S. Dakota. Now the rates from any state are comparable to the country as a whole.

Table I is here inserted to show the number of births and deaths reported from 1908 to 1931, the excess of births over deaths and the vital index (i. e. 100 Births Deaths for the years 1908 through 1931).

TABLE I.

THE NUMBER OF BIRTHS AND DEATHS IN MONTANA 1908-1931. THE EXCESS OF BIRTHS OVER DEATHS AND THE VITAL INDEX.

Year	Births	Deaths	Excess Births Over Deaths	Vital Index
December, 1907, through November, 1908...	5,842	4,353	511	134.2
July 1, 1908, to June 30, 1909.....	6,021	4,244	1,780	142.0
July 1, 1909, to June 30, 1910.....	6,294	3,911	2,383	160.9
Calendar Year				
1910 .....	6,124	3,996	2,128	153.2
1911 .....	7,542	4,606	3,536	188.2
1912 .....	8,133	4,397	3,736	185.0
1913 .....	8,682	5,098	3,584	170.3
1914 .....	9,069	5,048	4,021	197.5
1915 .....	11,132	5,242	5,890	212.3
1916 .....	11,300 <sup>a</sup>	5,483	5,817	206.0
1917 .....	11,600 <sup>a</sup>	6,421	5,179	180.6
1918 .....	11,800 <sup>a</sup>	8,985	2,815	131.3
1919 .....	12,017	5,786	6,231	207.7
1920 .....	11,862	5,289	6,573	224.2
1921 .....	12,127	4,693	7,438	258.4
1922 .....	11,060	5,106	5,954	216.6
1923 .....	10,524	4,914	5,615	214.4
1924 .....	10,283	4,994	5,292	206.0
1925 .....	10,302	5,103	5,199	201.9
1926 .....	10,008	5,375	4,633	186.1
1927 .....	9,875	5,185	4,690	190.0
1928 .....	10,072	5,812	4,260	173.3
1929 .....	10,080	5,748	4,332	175.4
1930 .....	10,004	5,435	4,569	181.0
1931 .....	9,642	5,278	4,364	182.7

<sup>a</sup> Estimated.

<sup>c</sup> Flu Year.

From this table it may be observed that the death reporting became complete more rapidly than the birth reporting. The death reports may be said to accurate in 1910 while the birth reporting did not reach this point until 1919. The largest number of births were reported in 1921. The Vital index column shows that over twice as many births as deaths were reported from 1915 through 1925 with the exception of the flu year 1917-1918, when the excessive number of deaths brought the index down. The years 1928 and 1931 are the only years since 1915 in which the births registered have been less than 10,000.

The population on which the rates for the following table are calculated for both 1930 and 1931 are based upon the Federal Census of 1930. (For population of the various counties and cities see page 25 of the Fifteenth Biennial Report, Montana State Board of Health 1929-1930.)

#### DEATHS 1930 (See Table II following.)

In 1930 there were 5435 deaths reported to the State Board of Health. The death rate for 1930 was 10.1 per 1,000 of population, this compared to the U. S. Registration Area is 1.2 per 1000 lower. The whole country's average was 11.3 for that year. The coun-

ties having the highest death rates were Deer Lodge 20.7 (includes State Hospital and State Tuberculosis Sanitarium), Silver Bow 15.6, Mineral 14.1, Lewis and Clark 14.0 (includes U. S. Veterans Hospital) and Glacier 12.8. Those having the lowest rate were; Daniels, Judith Basin and Liberty tied for low with 3.6 each, Wibaux 4.0, Powder River 4.1, McCone 4.6 and Prairie 4.8.\*

#### BIRTHS 1930. (See Table III following).

The births registered in 1930 amounted to 10,004 and the birth rate was 18.6 per 1000 of population. This rate is 0.3 per 1000 less than the Registration Area, which was 18.9 in 1930. The counties having the highest birth rates were: Roosevelt 31.5, Custer 26.2, Fallon and Pondera tied 26.1, Hill 25.4, while Big Horn and Glacier tied for 5th place with 23.8 each. With the exception of Custer and Fallon counties the others all include Indian Reservations. The lowest rates appear for Judith Basin 4.6, Mineral 6.8, Meagher 7.0, Granite 8.3 and Sanders 9.0.\*

#### DEATHS 1931 (See Table IV following.)

There was a decided drop in the number of deaths reported in 1931 compared to 1930. The total number registered was 5278 and the rate was 9.8 per 1000 of population. For the Registration Area the death rate was 11.1 which gives Montana a rate of 1.3 per 1000 lower than the whole country. The Federal Census Bureau comments that there were 11 states in 1931 which had death rates under 10 per 1000. The report shows Montana to be the eighth lowest. The counties having the highest death rates in 1931 were: Deer Lodge 19.7 (includes State Hospital and Tuberculosis Sanitarium), Glacier 16.4, Lewis and Clark 15.2, (includes U. S. Veterans Hospital), Big Horn 14.6 and Silver Bow 13.4, Silver Bow County dropped from second high in 1930 to fifth place in 1931, due in the most part to the shut down of the mines. The counties having the lowest rates were; Judith Basin 1.7, Liberty 1.8, Golden Valley 1.9, Garfield 2.6 and Powder River with 3.1.\*

#### BIRTHS 1931. (See Table V following.)

The birth rate continues to decline. In 1931 there were 9642 births registered giving a birth rate of 17.9 per 1000. 1931 is the second time in the past 17 years in which the number of births reported has dropped below 10,000. Montana's birth rate, however, has not declined as rapidly as that of the whole country. The Registration Area for 1931 was 17.8, thus Montana's rate is 0.1 per 1000 higher than the country's average and is the first time in history we have exceeded the average. The counties showing the highest rates in 1931 were: Roosevelt 27.5, Lake 26.8, Glacier 25.1, Hill 24.9 with Daniels and Custer tied for fifth with 23.8. As in 1930 Custer, but with Daniels instead of Fallon, are the only ones in which Indian Reservations are not located. \*

Those counties with the lowest birth rates were; Mineral 4.9, Judith Basin 5.9, Meagher 6.2, Granite 6.3 and Petroleum 6.8. The first four mentioned were also lowest in 1930.\*

\*The low rates shown for certain counties, are possibly due to the fact that the births and deaths normally of these localities occur in adjacent counties having better hospital facilities.

**TABLE II.**  
**1930 DEATHS BY COUNTIES AND MONTHS AND RATE PER 1,000**  
**OF POPULATION**

COUNTIES	MONTHS												Total	Rate per 1,000
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
Montana Total	512	427	472	490	469	439	481	402	435	441	438	420	5435	10.1
Beaverhead	10	2	7	3	6	6	5	6	11	3	5	1	65	9.8
Big Horn	13	7	6	6	8	2	8	5	10	7	11	14	97	11.1
Blaine	9	5	8	3	8	6	4	4	2	7	1	6	63	7.9
Broadwater	2	4	1	1	1		1	1	2		2	2	17	6.2
Carbon	4	5	12	10	7	2	5	5	5	8	9	6	81	6.4
Carter		1	1	1	6	2	1				3	1	24	5.8
Cascade	42	34	34	43	39	32	12	30	26	38	39	28	427	10.4
Chouteau	7	4	4	4	10	4	6	1	3	9	5	4	61	7.1
Custer	5	12	18	14	10	5	12	11	7	14	5	15	128	11.4
Daniels	2		1	4		1		2	4	2	1	3	20	3.6
Dawson	10	8	7	5	8	6	8	3	12	10	8	7	92	9.3
Deer Lodge	26	24	33	39	22	27	37	28	24	22	31	21	337	20.7
Fallon	1	5	5	3	2	3	1	4	3	2		4	33	7.2
Fergus	11	4	9	16	16	10	9	10	14	7	11	22	139	8.4
Flathead	23	20	16	21	17	14	17	20	17	24	9	15	213	11.1
Gallatin	16	10	9	6	9	11	17	13	6	13	11	15	136	8.1
Garfield	3		1	3	1	2	2	2	5	1		2	22	5.2
Glacier	5	1	6	1	11	7	5	5	6	6	4	6	68	12.8
Golden Valley	3	1	2			3	2					1	12	5.6
Granite	4		2	5	1	4	4	2	1	3	2		28	9.3
Hill	9	6	19	12	13	15	13	6	18	9	12	6	138	10.0
Jefferson	5	2	2	4	1	3	4		6	7	4	5	43	10.1
Judith Basin	3	3		1	2	1	1	1		3	2	2	19	3.6
Lake	12	10	9	14	10	7	13	10	6	3	7	11	112	11.7
Lewis & Clark	25	22	17	20	23	20	22	25	24	19	25	14	256	14.9
Liberty			2			2			2	2			8	3.6
Lincoln	3	7	1	4	6	13	2	5	4	1	9	3	58	8.2
McCone	1	4	1	1	3	1	3	1	3	1	2	1	22	4.6
Madison	1	2	3	4	1	6	3	6	3	3	4	2	38	6.9
Meagher	3	1	1	2	3	1	2	2		2			17	7.5
Mineral	1	1	3	1		4	1	3	3	1	2	3	23	14.1
Missoula	33	12	29	17	27	20	36	14	25	14	20	20	267	12.3
Musselshell	6	6	4	5	6	3	6	3	3	5	5	4	56	7.7
Park	5	10	8	7	10	5	11	7	8	11	8	13	103	9.4
Petroleum			2		3		1	1	1	1	1	1	11	5.4
Phillips	1	3	4	2	2	3	3	5	6	7	3	2	41	5.0
Pondera	4	4	6	3	7	10	6	8	6	6	3	4	67	9.3
Powder River		1	1	2	2	2	1	1	2	2	2	2	16	4.1
Powell	10	5	3	5	5	8	1	4	7	5	5	4	62	10.0
Prairie	2	1	2		2	1	2		1	3	2	3	19	4.8
Ravalli	6	8	10	15	10	6	2	9	11	7	8	8	100	9.7
Richland	2	2	3	5	2	7	7	2	8	6	3	3	50	5.2
Roosevelt	6	5	6	9	13	10	5	12	8	4	4	5	87	8.2
Rosebud	8	7	3	12	6	8	6	7	4	5	10	4	80	10.9
Sanders	7	7	2	2	2	1	6	4	4	3	4		42	7.4
Sheridan	4	6	4	9	3	11	5	3	5	4	5		59	6.0
Silver Bow	95	105	87	74	71	72	69	52	61	69	66	70	891	15.6
Stillwater	4	1	4	2	5	4	9	2	1	3	2	6	43	6.9
Sweet Grass	5	1	2	7	4	5	5	2	1	4	1	1	38	9.6
Teton	3	3	6	10	4	5	1	2	5	3	9	5	56	9.2
Tecole	3		5	7	5	2	7	8	2	6	4	3	52	7.7
Treasure	2	1		3		1		1	2	1			11	6.6
Valley	6	7	6	4	2	3	8	6		12	7	6	67	6.0
Wheatland	3	3	3	2	1	3	2	1	3		3	8	32	8.5
Wibaux		1		3	1		1	1	1	1	1	1	11	4.0
Yellowstone	35	20	32	43	32	29	29	36	28	31	38	24	377	12.2

**TABLE III.**  
**1930 BIRTHS BY COUNTIES AND MONTHS AND RATE PER 1,000**  
**OF POPULATION**

COUNTIES	MONTHS												Rate per 1,000	
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
Montana Total	843	816	886	855	893	873	833	935	798	774	728	770	10004	18.6
Beaverhead	7	6	5	9	11	9	6	6	5	8	9	10	91	13.7
Big Horn	16	20	14	20	14	14	17	16	15	17	17	20	200	23.1
Blaine	14	19	24	19	23	16	16	25	18	7	13	20	214	23.8
Broadwater	2	2	3	1	2	2	2	6	2	3	3	4	32	11.7
Carbon	14	28	22	20	26	13	25	27	17	20	24	17	253	20.1
Carter	11	4	2	6	2	2	3	4	2	7	3	8	54	13.1
Cascade	84	72	89	85	78	73	73	74	71	68	66	63	902	21.9
Chouteau	5	1	13	11	10	20	8	10	5	6	6	9	107	12.1
Custer	26	20	29	21	28	28	24	34	18	17	26	23	294	26.2
Daniels	9	6	13	6	16	9	12	12	7	11	6	15	122	22.6
Dawson	20	16	14	15	22	27	21	14	12	10	25	22	218	22.1
Deer Lodge	17	20	27	18	23	18	22	24	15	20	20	15	239	14.7
Fallon	10	11	5	10	12	5	9	14	11	13	7	12	119	26.1
Fergus	29	24	39	39	35	29	31	23	30	31	27	26	363	22.9
Flathead	32	22	35	31	39	35	20	40	33	25	31	52	375	19.5
Gallatin	27	27	24	18	27	27	28	31	27	25	16	18	295	18.3
Garfield	1	7	6	5	5	4	2	10	6	5	1	5	60	14.1
Glacier	15	8	13	9	18	12	8	11	8	6	7	11	126	23.8
Golden Valley	1	1	1	2	2	3	6	2	1	3	1	1	25	11.8
Granite	1	4	1	1	2	2	3	1	1	2	4	1	25	8.3
Hill	25	32	32	25	21	30	32	33	37	19	25	39	350	25.4
Jefferson	2	4	3	7	1	2	3	5	6	3	4	1	13	10.4
Judith Basin	2	2	2	4	1	1	2	2	3	2	2	2	24	4.6
Lake	17	16	16	17	17	12	11	20	11	15	11	13	176	18.4
Lewis & Clark	34	25	25	26	35	36	24	24	33	27	30	12	331	18.2
Liberty	1	2	2	2	3	2	3	4	2	1	2	3	25	11.4
Lincoln	11	15	10	10	6	5	8	14	15	7	6	13	129	16.9
McCone	8	5	3	7	5	6	6	10	9	7	4	1	73	15.2
Madison	4	4	4	3	2	8	8	5	5	8	7	4	62	9.8
Meagher	3	3	1	1	1	1	1	2	1	1	1	1	16	7.0
Mineral	1	1	1	1	1	1	2	2	2	2	2	1	11	6.8
Missoula	35	26	39	33	35	39	30	45	24	31	34	25	396	18.2
Musselshell	9	10	12	10	8	13	7	9	4	10	7	17	116	16.9
Park	21	9	12	15	9	15	18	24	10	14	7	15	169	15.5
Petroleum	5	2	2	1	2	1	1	1	1	3	2	2	21	10.5
Phillips	13	12	10	10	11	16	14	14	12	15	11	10	148	18.0
Pondera	9	9	24	14	20	15	14	21	13	13	11	18	181	26.1
Powder River	6	5	5	1	3	4	6	3	2	3	3	2	43	11.0
Powell	6	6	7	7	4	8	8	11	8	9	2	5	81	13.1
Prairie	7	7	3	10	2	8	8	9	5	8	2	6	75	19.0
Ravalli	10	11	16	17	12	10	9	21	12	23	14	8	163	15.8
Richland	10	29	19	17	24	22	24	16	16	30	12	16	226	25.5
Roosevelt	37	21	39	26	27	32	34	25	33	22	31	18	336	31.5
Rosebud	10	19	7	16	14	13	13	11	11	15	11	12	152	20.7
Sanders	3	3	5	9	5	3	4	4	2	8	3	2	51	9.0
Sheridan	25	13	20	11	18	23	13	14	21	12	16	11	197	20.0
Silver Bow	71	85	88	78	90	83	85	80	77	61	62	69	890	15.8
Stillwater	5	7	3	14	13	4	14	12	11	7	8	7	105	16.8
Sweet Grass	19	3	8	8	4	6	8	6	3	7	4	7	74	18.8
Teton	3	6	5	7	6	6	1	9	11	6	7	4	71	11.7
Toole	10	5	7	7	6	5	9	12	3	4	7	10	85	12.7
Treasure	7	6	5	5	3	3	3	1	3	2	1	1	37	22.3
Valley	22	21	18	18	14	18	25	23	14	11	12	9	205	18.3
Wheatland	2	7	10	7	7	10	6	2	7	7	3	4	72	19.2
Wibaux	1	5	4	8	4	1	4	4	2	1	1	8	43	15.5
Yellowstone	39	71	48	54	58	64	72	56	57	59	55	60	713	23.2

TABLE IV.  
1931 DEATHS BY COUNTIES AND MONTHS AND RATE PER 1,000  
OF POPULATION

COUNTIES		MONTH												Rate per 1,000	
		Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		Total
Montana	Total	445	479	476	497	429	424	438	424	415	445	381	425	5278	9.8
Beaverhead		7	8	5	6	6	7	3	3	11	6	2	7	71	10.7
Big Horn		8	14	9	11	12	16	11	9	6	11	8	10	125	14.6
Blaine		2	2	4	5	6	7	8	3	5	4	2	6	54	6.9
Broadwater			2		1		2	2	1	2		3	2	15	5.5
Carbon		6	9	8	7	7	8	5	6	8	6	6	9	85	6.8
Carter		3	8	3	1	3	4	1	1		2	1	3	30	7.3
Cascade		26	28	45	26	30	33	26	36	30	30	27	34	371	9.0
Chouteau		2	5	5	5	2	4		5	3	6	5	1	43	5.0
Custer		9	12	10	9	14	8	11	12	10	6	12	14	127	11.3
Daniels		2	1	3	3	1	2	1	2	2	3	3	3	28	5.0
Dawson		4	8	4	7	4	7	15	8	6	5	5	5	78	7.9
Deer Lodge		31	31	31	33	22	20	26	29	27	25	19	27	321	19.7
Fallon		5	2	2	3	1	3	4	3	2	1	1	2	32	7.0
Fergus		10	8	10	8	12	11	13	10	18	12	5	13	130	7.9
Flathead		28	18	14	26	16	23	8	23	13	17	16	19	221	11.5
Gallatin		19	13	15	14	11	15	17	12	18	14	13	11	172	10.7
Garfield		1	1	2	1					1	1	2	2	11	2.6
Glacier		2	3	9	15	7	4		10	10	12	9	6	87	16.1
Golden Valley								1		1	1	1		4	1.9
Granite		1	1	4	2	4	2		1	2	3	3	3	26	8.6
Hill		17	10	14	17	9	7	12	10	12	15	8	4	135	9.8
Jefferson			9	2	3	5	1	4	5	2	1	4	5	41	9.9
Judith Basin		1	2	1		2	1		1		1			9	1.7
Lake		13	7	10	13	6	7	12	7	3	9	4	8	99	10.4
Lewis & Clark		27	19	27	21	23	19	25	23	23	24	24	22	277	15.2
Liberty		1		1	1								1	4	1.8
Lincoln		5	8	9	3	4	7	5	6	2	5	10	2	66	9.3
McCone		5	1		2	5		4	2	2			2	23	4.8
Madison		11	7	7	7	5	2	3	5	3	3	7	2	62	9.8
Meagher		2	1	2		1	4	1	5	2		1	2	21	9.2
Mineral			1	1	1	1	1	2	2	1	2	2	2	16	9.8
Missoula		23	21	21	17	23	28	32	16	25	26	24	18	274	12.6
Musselshell		5	7	6	5	3	5		5		2	4	4	46	6.1
Park		5	13	7	14	10	8	13	9	9	9	12	8	117	10.7
Petroleum		2						1	1	1				7	3.4
Phillips		3	6	2	4	4	5	4	3	7	1	3	9	51	6.2
Pondera		7	10	10	4	5	9	2	3	5	5	1	4	65	9.2
Powder River			2	1		1			2	1	3	2		12	3.1
Powell		5	5	4	6	9	4	8	4	3	9	6	5	68	11.0
Prairie		4	3	2	1	2		1	1	1	2	1	2	20	5.1
Ravalli		7	14	13	9	6	8	8	12	3	10	9	7	106	10.3
Richland		5	4	6	10	6	7	3	13	7	7	4	5	77	8.0
Roosevelt		7	6	12	13	7	6	12	5	7	8	7	6	96	9.0
Rosebud		6	6	4	7	3	7	4	6	10	8	7	12	80	10.9
Sanders		4		3	2	2	9	1	3	2	3	1	5	36	6.3
Sheridan		5	7	2	2	6	4	4	1	4	4	3	5	47	4.8
Silver Bow		63	90	72	101	53	43	73	37	47	68	50	65	762	13.1
Stillwater		3	4	3	4	6	3	5	8	5	1	10	8	60	9.6
Sweet Grass		2	3	4	2	4	1	4	5		6	1	5	37	9.4
Teton		6	5	2	3	6	2	1	8	1	1	3	2	40	6.6
Toole		3	2	3	5	1	2	4	4	6	3	1	2	39	5.8
Treasure		1	4	1	1							1		8	4.8
Valley		5	3	6	6	4	9	7	3	9	10	5	7	74	6.6
Wheatland		3	3	4	4	4	2	4	3	3	1		2	33	8.8
Wibaux		1	2	3		2	4	2	1		2			17	6.1
Yellowstone		22	20	28	23	37	33	25	31	34	31	21	17	322	10.5

**TABLE V.**  
**1931 BIRTHS BY COUNTIES AND MONTHS AND RATE PER 1,000**  
**OF POPULATION**

COUNTIES	MONTHS												Rate per 1,000
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Montana Total	811	739	848	810	868	781	842	833	814	800	731	735	9642 17.9
Beaverhead	7	2	7	9	13	2	7	4	11	7	4	4	77 11.5
Big Horn	16	9	17	14	14	15	16	15	21	8	15	20	180 21.1
Blaine	29	11	21	14	19	14	17	21	18	19	12	14	200 22.2
Broadwater	2	1	5		7	3	1	4	2	2	5		32 11.7
Carbon	21	16	29	15	29	21	12	20	19	19	19	17	237 18.9
Carter	6	3	7	10	2	3	2	6	7	8	4	1	59 14.3
Cascade	75	70	71	67	73	67	68	82	85	63	55	54	830 20.2
Chouteau	6	9	14	15	6	10	16	5	8	12	7	7	115 12.3
Custer	17	17	21	21	23	24	36	21	21	16	19	32	268 23.8
Daniels	9	11	9	10	10	13	6	12	23	7	13	9	132 23.8
Dawson	17	16	16	17	23	13	21	24	17	19	12	10	205 20.7
Deer Lodge	23	18	16	13	25	25	22	18	15	19	13	13	220 13.5
Fallon	11	5	11	7	7	9	9	1	10	9	10	4	93 20.4
Fergus	19	24	20	18	37	28	21	27	16	24	16	23	273 13.5
Flathead	39	41	30	38	33	16	36	28	29	35	37	30	392 20.4
Gallatin	22	16	35	23	32	19	31	26	22	25	20	33	302 18.7
Garfield	7	4	7	6	6	4	12	3	3	9	4	3	68 16.0
Glacier	3	17	14	14	7	15	14	11	8	13	8	9	133 25.1
Golden Valley		4			2		4	2	2	1		1	16 7.5
Granite	2			1	4	2	3	3	2			2	19 6.3
Hill	31	28	35	29	26	30	25	29	33	29	23	22	343 24.9
Jefferson	3	4	6	2	2	4	2	3	4	3	6	3	42 10.2
Judith Basin	3	3	6	2	2	2	2	4	2	3		2	31 5.9
Lake	15	16	33	19	23	27	15	23	21	12	21	30	256 26.8
Lewis & Clark	27	32	34	33	28	29	42	31	30	33	35	24	378 20.7
Liberty	3	3	2	3	3			1	2			1	18 8.2
Lincoln	9	13	12	12	10	6	9	12	5	8	14	17	127 11.9
McCone	6	9	4	9	7	12	4	10	5	11	3	7	87 18.2
Madison	7	4	4	7	6	7	5	6	11	3	4	5	69 10.9
Meagher		2	2	2	4		2		1			1	14 6.2
Mineral				4		1				1	2		8 4.9
Missoula	37	35	26	36	41	30	28	35	28	32	42	33	403 18.5
Musselshell	10	5	9	10	8	8	9	11	5	11	8	2	96 13.3
Park	11	11	14	14	15	21	19	13	14	16	15	21	184 16.8
Petroleum	3		2			1	2	1	1	1	1		14 6.8
Phillips	16	13	15	9	14	17	25	14	11	5	2	13	154 18.8
Pondera	17	8	18	16	15	9	10	9	15	19	14	12	162 22.3
Powder River		3	4	6	8	1	3	1	4	3	3	5	41 10.5
Powell	3	8	6	7	5	7	6	6	8	4	7	6	73 11.8
Prairie	6	9	5	7	5	6	4	4	8	5	6	8	73 18.5
Ravalli	10	21	11	16	18	10	12	14	14	16	13	10	165 16.0
Richland	32	12	14	21	16	15	18	22	14	21	21	15	221 22.9
Roosevelt	9	25	18	32	23	37	25	26	25	26	22	26	294 27.5
Rosebud	16	13	18	14	7	8	11	14	14	12	16	11	154 21.0
Sanders	9	6	5	5	6	2	9	4	5	5		2	58 10.2
Sheridan	19	17	16	21	15	15	8	13	11	7	12	17	165 16.7
Silver Bow	69	52	74	57	72	56	61	71	66	73	64	57	775 13.6
Stillwater	9	12	8	11	12	6	7	7	5	8	9	9	103 16.5
Sweet Grass	5	7	6	7	2	7	8	10	8	6	4	3	73 18.5
Teton	7	3	5	5	1	10	5	4	8	8	8	4	68 11.2
Toole	5	7	8	8	6	5	16	6	2	12	5	3	84 12.5
Treasure	3	2		2	1	2		4	2	3	3	3	25 15.1
Valley	13	16	17	20	17	19	13	25	20	23	13	11	210 18.8
Wheatland	7	4	7	7	6	3	13	7	4	4	7	4	73 19.5
Wibaux	2	1	1	1	1	4	4	2	7	7	3	4	43 15.5
Yellowstone	64	41	59	68	69	61	59	58	61	57	52	58	707 23.0

## CAUSES OF DEATH—COMMUNICABLE DISEASES

TABLE VI.

THE DEATHS AND DEATH RATES PER 100,000 OF POPULATION,  
COMMUNICABLE DISEASES, 1930 AND 1931

Disease	1930		1931	
	Deaths	Rate	Deaths	Rate
Typhoid .....	16	3.0	12	2.2
Small Pox .....	1	0.2	0	0.0
Measles .....	12	2.2	2	0.4
Scarlet Fever .....	15	2.8	10	1.9
Whooping Cough .....	16	3.0	48	8.9
Diphtheria .....	4	0.7	8	1.5
Influenza .....	102	19.0	175	32.6
Mumps .....	3	0.6	4	0.7
Dysentery .....	7	1.3	14	2.6
Erysipelas .....	15	2.8	16	3.0
Polioomyelitis .....	6	1.1	15	2.8
Lethargic Encephalitis .....	9	1.8	7	1.3
Epidemic Meningitis .....	22	4.1	12	2.2
Spotted Fever .....	9	1.8	7	1.3
Chicken Pox .....	1	0.2	1	0.2
Tetanus .....	1	0.2	0	0.0
Anthrax .....	0	0.0	1	0.2
Tuberculosis (All Forms) .....	337	62.7	326	60.6
Syphilis .....	44	8.2	33	6.1
Gonococcus .....	0	0.0	1	0.2
Septicemia .....	14	2.6	10	1.9
Mycosis .....	0	0.0	1	0.2
Tularemia .....	0	0.0	2	0.4
Psittacosis .....	1	0.2	0	0.0
Total .....	635	118.1	705	131.1

The year 1930 was the best year from the public health standpoint of any year in history, i. e., there were fewer deaths from communicable disease and we had the lowest death rate from these causes that we have ever experienced.

Commenting on Table VI preceding, there are a few points to which attention should be directed. 1st. There were only 4 deaths from diphtheria in 1930, the rate was 0.7 per 100,000, the lowest in our history. The Census Bureau in their 1930 report credits us with having the lowest death rate from this disease of any State in the Union. 2nd. The psittacosis death in 1930 is the only time this cause has ever appeared in the records. 3rd. There were no deaths from small pox in 1931. This is the second year in history in which at least one death from small pox has not been registered. 4th. In 1931 we had the fewest deaths from typhoid fever and the lowest death rate in history. 5th. The scarlet fever deaths and rate for 1931 were tied one other year for the lowest on record. 6th. The 326 tuberculosis deaths were the fewest and the rate of 60.6 was the lowest ever. 7th. The two deaths from tularemia in 1931 are the only instances of deaths from this cause in the records.

The greatest number of communicable disease deaths in 1931 over 1930 may be attributed to the excess of influenza deaths for that year.

**TABLE VII.**  
**GROUPS AND PRINCIPLE CAUSES OF DEATH IN EACH GROUP AND**  
**THE RATE PER 100,000**

Cause	1930		1931	
	Deaths	Rate	Deaths	Rate
General Disease .....	719	133.7	718	133.6
Cancer .....	425	79.1	412	76.6
Diabetes .....	87	16.2	84	15.6
Thyroid .....	48	9.3	23	4.3
Alcohol .....	69	12.8	71	13.2
Nervous System .....	529	98.4	504	93.7
Apoplexy .....	357	66.4	366	68.1
Circulatory System .....	811	150.9	824	153.3
Heart .....	759	141.2	748	139.1
Respiratory System .....	498	92.6	419	77.9
Pneumonias (All Forms) .....	425	79.1	367	68.3
Digestive System .....	492	91.3	449	83.5
Diarrhea and Enteritis, under 2 yr. ....	76	14.1	54	10.0
Appendicitis .....	113	21.3	110	20.5
Intestinal Obstruction .....	60	11.2	72	13.4
Other Liver .....	99	18.4	78	14.5
Genito-Urinary Systems .....	477	88.7	437	81.3
Nephritis .....	395	66.8	362	67.3
Prostate .....	39	7.3	42	7.8
Puerperal Causes .....	67	12.5	67	12.5
Puerperal Sepsis .....	25	4.7	16	3.0
Other Puerperal .....	42	7.8	51	9.5
Skin and Cellular .....	51	9.5	27	5.0
Congenital Malformations .....	67	12.5	53	9.9
Early Infancy .....	270	50.2	261	48.5
Old Age .....	75	14.0	68	12.6
External Causes .....	693	128.9	667	124.1
Suicides .....	136	25.3	126	23.4
Homicides .....	59	11.0	36	6.7
Accidents .....	498	92.6	505	93.9
Automobiles .....	106	19.7	130	24.2
(Including railroad and street car collisions) .....				
Falls .....	79	14.0	74	13.8
Drowning .....	54	10.0	43	8.0
Mines and Quarries .....	35	6.5	34	6.3
Firearms .....	35	6.5	32	6.0
Unknown .....	66	12.3	68	12.6

#### OTHER PRINCIPLE CAUSES OF DEATHS

The cancer death rate was lower in 1931 than in 1930. This is the second consecutive year in which there has been a slight drop in the rate for cancer. There had been a continuous increase in this death rate for the seven years preceding 1930.

The death rate from alcoholism continues to climb. There has been an almost continuous increase in the rates from this cause since 1918, and we are now approaching the pre-prohibition level of 1914 and 1915.

Diseases of the heart were the greatest cause of death in both 1930 and 1931, followed by total accidents for second place with cancer and all forms of pneumonia for third and fourth respectively.

Nephritis was fifth and apoplexy sixth in 1930 while they reversed their positions in 1931, while all forms of tuberculosis were the seventh greatest cause of death both years. Early infancy and congenital malformations tied tuberculosis for seventh place in 1930 but was eighth in 1931. Appendicitis and suicides were ninth and tenth in 1930, while auto accidents replaced appendicitis in 1931 and the suicides remained tenth.

TABLE VIII.

## THE INFANT AND MATERNAL MORTALITY BY COUNTIES AND THE RATES PER 1,000 LIVE BIRTHS, 1930-1931

COUNTY	1930				1931			
	Infant Deaths	Rate	Maternal Deaths	Rate	Infant Deaths	Rate	Maternal Deaths	Rate
Beaverhead .....	6	65.9	.....	.....	6	77.9	.....	.....
Big Horn .....	23	115.0	1	5.0	31	172.2	4	22.2
Blaine .....	13	66.7	.....	.....	14	70.0	1	5.0
Broadwater .....	3	93.8	.....	.....	1	31.3	.....	.....
Carbon .....	16	63.2	2	7.9	14	59.1	1	4.2
Carter .....	5	92.6	.....	.....	3	50.8	.....	.....
Cascade .....	39	43.2	6	6.7	44	53.0	9	19.8
Choteau .....	4	37.4	1	9.3	5	43.5	.....	.....
Custer .....	11	37.4	5	17.0	15	56.0	2	7.5
Daniels .....	7	57.1	.....	.....	3	22.7	1	7.6
Dawson .....	10	45.9	.....	.....	9	43.9	2	9.8
Deer Lodge .....	13	54.4	2	8.4	11	50.0	2	9.7
Fallon .....	6	50.4	2	16.8	6	64.5	.....	.....
Fergus .....	12	33.1	3	8.3	8	29.3	3	11.0
Flathead .....	18	48.0	5	13.3	19	48.5	2	5.1
Gallatin .....	15	50.8	1	13.6	20	65.2	2	6.6
Garfield .....	4	66.7	.....	.....	1	14.7	.....	.....
Glacier .....	20	158.7	1	7.9	23	172.9	1	7.5
Golden Valley .....	1	40.0	.....	.....	0	0	0	0
Granite .....	0	0.0	0	0	0	0	0	0
Hill .....	22	62.9	3	8.6	20	58.3	.....	.....
Jefferson .....	2	46.5	.....	.....	3	71.4	.....	.....
Judith Basin .....	1	41.7	.....	.....	5	161.3	.....	.....
Lake .....	14	79.5	1	5.7	21	82.0	2	7.8
Lewis & Clark .....	22	66.5	2	6.0	17	45.0	3	7.9
Liberty .....	1	40.0	.....	.....	1	55.6	.....	.....
Lincoln .....	5	41.7	1	8.3	5	39.4	.....	.....
McCone .....	9	123.3	1	13.7	3	34.5	1	11.7
Madison .....	2	32.3	.....	.....	2	29.0	.....	.....
Meagher .....	3	187.5	.....	.....	1	71.4	.....	.....
Mineral .....	3	272.7	.....	.....	0	.....	0	.....
Missoula .....	19	48.0	4	10.1	19	47.1	5	12.4
Musselshell .....	7	60.3	2	17.2	6	62.5	.....	.....
Park .....	12	71.0	1	5.9	12	65.2	.....	.....
Petroleum .....	0	.....	0	.....	0	.....	0	.....
Phillips .....	10	67.6	1	6.8	6	39.0	2	13.0
Pondera .....	11	60.8	.....	.....	14	86.4	1	6.2
Powder River .....	6	139.5	.....	.....	4	97.6	.....	.....
Powell .....	5	61.7	.....	.....	5	68.5	.....	.....
Prairie .....	4	53.3	.....	.....	3	41.1	1	13.7
Ravalli .....	9	55.2	1	6.1	9	54.5	.....	.....
Richland .....	10	44.2	.....	.....	18	81.4	3	13.6
Roosevelt .....	10	26.8	1	3.0	17	57.8	3	10.2
Rosebud .....	13	85.5	3	19.7	16	103.9	.....	.....
Sanders .....	3	58.8	.....	.....	5	86.2	.....	.....
Sheridan .....	11	55.8	.....	.....	5	30.3	.....	.....
Silver Bow .....	46	51.2	8	8.9	45	58.1	6	7.7
Stillwater .....	4	38.1	.....	.....	7	68.0	.....	.....
Sweet Grass .....	6	81.1	2	27.0	3	41.1	.....	.....
Teton .....	2	28.2	.....	.....	3	41.1	.....	.....
Toole .....	6	70.6	1	11.8	2	23.8	.....	.....
Treasure .....	5	155.1	.....	.....	2	80.0	.....	.....
Valley .....	8	39.0	1	4.9	7	33.3	4	19.0
Wheatland .....	4	55.6	.....	.....	4	54.8	2	27.1
Wibaux .....	1	23.3	.....	.....	4	93.0	.....	.....
Yellowstone .....	47	65.9	2	2.8	51	72.1	4	5.7
Total .....	569	56.9	67	6.7	578	59.9	67	6.9

There were 569 babies who died in Montana in 1930 and 578 in 1931. The infant mortality rate for the two years was 56.9 and 59.9 respectively. Montana rates are lower than the Registration Area in both years. The areas rates were 64.7 in 1930 and 61.7 in 1931. Compared to the rates of one and two decades ago our rates for the past two years are very favorable. In 1920 the rate was 72.2 and in 1910 116.6 per 1000.

In a comparison of the urban infant mortality rates by States, the American Child Health Association gives the Montana cities over 10,000 fourth place in the nation for 1931, with a rate of 50 per 1000 live births. We are exceeded only by Oregon 41.0, Vermont 48.0, California 49.0. Montana and Oklahoma tied for fourth with 50.0. The average for 880 cities of the country was 61.2.

There were 67 deaths of mothers in childbirth for both the years 1930-1931. The maternal mortality rate was 6.7 per 1000 live births in 1930 and 6.9 in 1931, the rise in the rate is due entirely to the fact that there were fewer births registered in 1931 than during the previous year. The rates compare very favorably with those of the two preceding decades. In 1910 the rate was 10.1 and in 1920 8.8 per 1000 live births.

**REPORT OF THE CHILD WELFARE DIVISION**  
**Biennial Period Ending November 30, 1932**

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**W. F. Cogswell, M. D., Acting Director**  
**Florence B. Jordan, Assistant Director**

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The Child Welfare Division of the State Board of Health was created by Legislative Act in 1917. This Act also gave county commissioners authority to appoint county health nurses and school boards authority to employ school nurses. All Public Health Nurses, no matter by whom appointed, were placed under the general supervision of the Child Welfare Division of the State Board of Health. The Secretary of the State Board of Health and the Superintendent of Public Instruction jointly were empowered to formulate regulations governing the activities of the Public Health Nurses.

It has been the policy of the Board to encourage the employment of such nurses wherever possible and the money appropriated to this Division has been used largely in aiding counties in paying the salaries of such nurses. In many counties one-third of the expenses of the county nurse has been paid by State, one-third by the Tuberculosis Association, and one-third by the county. We feel that this cooperative arrangement by this Division, the State Tuberculosis Association, and the counties is the very best plan that can be worked out at this time. We feel that when the counties are given a demonstration of the value of a public health nursing service and when the finances justify it each county will assume the entire expense of the county nurse.

During 1931 aid was given to 14 counties, in 1932 such aid was given to 23 counties. This increase in the number of counties given aid in 1932 over 1931 was due to the fact that the overhead expenses were cut down by the Secretary taking over the duties of Acting Director of the Division. The reasons making this possible are indicated in the opening statement of the Secretary in his biennial report.

### Public Health Nursing

In 1931 there were 58 Public Health Nurses reporting regularly to the State Board of Health, in 1932, 53, as follows:

	1931	1932
City and County Nurses .....	22	18
Indian Service Nurses .....	9	9
School Nurses .....	11	15
Tuberculosis Nurses .....	3	1
Metropolitan Life Insurance Nurses .....	5	5
Industrial Nurses .....	2	2
Itinerant Nurses (State and Tuberculosis).....	6	3

Reports in our office show that the work accomplished by the Public Health Nurses of the state during the two years includes:

Visits to Schools .....	8,538
No. of School Children Inspected .....	132,922
No. of Babies and Preschool Children Inspected .....	11,662
No. of Homes Visited .....	88,333
No. of Children Inoculated .....	17,206
No. of Children Vaccinated .....	10,068
No. of Prenatal Visits .....	2,418
Classes Conducted for Women and Girls.....	1,527

While this is not a complete report of the work done by the nurses it will give some indication as to the scope of such work.

This Division keeps in as close touch as possible with the nurses of the state, and sends literature to them to be distributed to the people of the various communities. During these two years 128,297 pieces of literature have been sent out, exclusive of prenatal literature.

During 1931 three county nurses were entirely supported by drought-relief funds, furnished by the United States Public Health Service. The counties thus aided were McCone, Phillips, and Valley. Aid was also given to Garfield and Stillwater Counties from the same fund.

During the time the State was receiving aid from the drought-relief funds of the Federal Government biologicals were furnished free to the drought counties. As a result many immunizations were done. In McCone County, where the Health Officer and the County Nurse put on a free immunization campaign, 95 percent of the school children and 50 percent of the preschool children were immunized against diphtheria. In Musselshell County, where the same plan was carried out, about the same percentage of children were immunized. A large percentage of the children in Phillips, Valley, and Stillwater Counties were also immunized. The results of these immunizing campaigns is reflected in our diphtheria death rates. During the first ten months of 1932 there have been only two deaths in the state. This is a record.

The Public Health Nurses of the State were given recognition by the Montana Graduate Nurses' Association when it met in Billings on May 24 and 25, 1932. A Public Health Nursing section was organized at this time.

#### **White House Conference Work**

Child Welfare work in Montana was stimulated by the State White House Conference on Child Health and Protection which was held at the Capitol building at Helena on December 10 and 11, 1931. This conference was well attended, all parts of the state well represented by delegates, official and unofficial. Some of the organizations which participated are: Medical and Dental Associations, Private and Public Schools and Colleges, American Red Cross, American Legion, Orphanages, Civic Organizations, such as Rotary, Lions, and Kiwanis, Charity Organizations, Fraternal Organizations, Churches, Salvation Army, and Farm Boards.

The state organization was patterned after that of the national organization. One of the immediate results of this state conference was the attempt to organize a Child Welfare Council in each county.

The planning committee consisting of Chancellor of the University of Montana, Chairman, Superintendent of Public Instruction, Director of Bureau of Child Protection and the Secretary of the State Board of Health, was appointed by Governor Erickson. This committee appointed chairmen in each of the counties. It is expected that through the aid of these chairmen Child Welfare Councils will be organized in each county. At the present time we have ten Child Welfare Councils organized in the following counties: Broadwater, Granite, Hill, Jefferson, Lewis and Clark, McCone, Phillips, Richland, Treasure, and Valley. The Assistant Director of this Division will aid in organizing those counties that are not yet organized. We believe that these councils should meet regularly at least once a month and have a definite program for each month. For instance, during the month of December their energy might be centered on Christmas Seal Sales. One month should be devoted to a survey of the number of crippled children in each of the counties, and the attention of the Orthopedic Commission called to such cripples. There should be a central organization to keep in close touch with the county organizations to work with a plan for uniform action. The Child Welfare Division hopes to be able to do this through its Assistant Director.

#### **General Educational Program**

During 1931 and 1932, 5000 "Six Point" buttons have been given out to children reaching the goal set by these buttons. The six points are: toxoid (immunization against diphtheria), smallpox vaccination, proper condition of teeth, vision, nutrition, and throat. These buttons are a great incentive to children to attain these health standards. Their desire to have these buttons is shown by the following extracts from letters:

"Dear Mr. Cogswell: We thank you for the Health buttons, but I had a sad accident with mine, by mistake mine was put in the fire along with some papers and I am heart-broken. If you will mail me another one I will take good care of it."

The next was written to a nurse who sent it on to us:

"I am writing in the behalf of my sister, my brother, and myself, to ask you, May we **Please** have our health buttons?"

Our vaccinations have taken, my teeth have been fixed and I have my eye glasses, as you know.

I am sure we deserve them, we've been outdoors all the time and have all learned to swim. We have been in top shape all this glorious vacation."

Of course, such appeals could not be turned down.

Prenatal literature to the extent of 11,761 copies has been sent out to expectant mothers in the last two years. Many letters expressing appreciation for this literature have been received. We have been gratified by the increase in the receipt of requests from the expectant mothers themselves.

This Division furnishes free to physicians, midwives, and hospitals ampules of nitrate of silver which is used as a prophylactic to prevent blindness in babies. There were 5,908 ampules sent out upon request.

There are, in this Division, twenty-eight films which are sent out to nurses, schools, clubs, and organizations of various kinds to be shown to special groups. These films vary from one-half to four reels. We receive many requests for these films which are educational and instructive as well as entertaining.

At the present time the Child Welfare Division has six traveling libraries. These libraries are filled with from eighteen to twenty books on health subjects and are sent to various organizations and to nurses.

The Division aids in the Preschool Round-up of the Parent-Teachers Association. The object of the Roundup is to secure a health examination for each child who is to enter school for the first time and to have physical defects corrected. The Acting Director contributes an article on some phase of child health to the bulletin of the Parent-Teacher Association each month. May Day is also becoming an important day in Montana as well as in other states. The County Child Health Councils use May Day as a focusing point for the year's work.

### CONCLUSION

The work of the Division is constantly increasing as it becomes better known throughout the state. Through its health education programs expectant mothers, infants, preschool children, and school children are served. Due to the Public Health Nurses' influence the service to the schools is increasing more rapidly than any other project.

"The health of the nation moves forward on the feet of little children." It is hoped that the Legislature will continue to appropriate adequate funds for this very valuable piece of child health work.

**REPORT OF THE DIVISION OF WATER AND SEWAGE**  
**Biennial Period Ending November 30, 1932.**

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**H. B. Foote, Director**

**W. M. Cobleigh, Consultant**

**O. P. Morgan, Assistant**

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The principal work of the Division of Water and Sewage is comprised of the following activities:

1. Bacteriological and chemical examination of water samples of both public and private supplies.
2. Field inspection of public and private water supplies.
3. Inspection of plans for public water supplies.
4. Field inspection of sewage disposal systems.
5. Inspection of plans for public sewage disposal systems.
6. Inspection of tourist camps and their water supplies.
7. Inspection and approval of plans for public school buildings.

A limited amount of interchange of work is made with the Food and Drug Division in the field, whereby economy is effected.

**LABORATORY ANALYSIS OF WATER**

The analysis of samples of water makes up the bulk of the laboratory work. A check upon the condition and operation of public water supplies is obtained by frequent routine bacteriological analysis. In order that each supply will receive proper attention at regular intervals, a calendar has been prepared which lists for each week the cities to which sampling equipment is to be sent. The equipment is usually sent out on Thursday.

The State Board of Health owns a considerable number of insulated shipping cases and bottles which are used for the collection and shipment of samples. These are sent by express, properly sealed, to the collector, who after collection of samples packs them with ice, seals and returns them to the laboratory by express, charges collect. The collector is usually the local water superintendent or the health officer, who is carefully instructed in the matter.

This system fits very satisfactorily into our extensive territory where the visiting of supplies is attended by considerable expense. The local collectors cooperate excellently so that little delay due to their failure to collect is experienced.

For the sealing, a self-locking tin seal is used on which is stamped the name of the State Board of Health, and a number for identification.

**LABORATORY ACTIVITY****December 1, 1930 to November 30, 1932.**

The following tabulation gives the amount of laboratory work done by this division during the past two years. The number of chemical analyses is large and requests for this type of work are being received constantly. Especially during the summer season when the field work requires much travel by the director or his assistant, leaving but one in the laboratory, there is need for extra help.

	Bacterial	Chemical
Samples analysed from city water supplies.....	8184	58
Samples analysed from private water supplies.....	1149	402
Samples analysed from miscellaneous sources, (schools, tourist camps, etc.).....	938	59
Total of all samples.....	10,790	
Previous biennial period.....	9,977	

**FIELD INSPECTIONS****Tabulation of Field Work for the Past Biennial****Period December 1, 1930 to November 30, 1932.**

Investigations:	
Public water supplies.....	282
Private water supplies.....	228
Sewage disposal systems.....	136
Miscellaneous.....	89
<b>TOTAL.....</b>	<b>735</b>

Practically all field work is done by railway travel since the water supplies and sewage disposal systems are in towns touched by the railroads. It is the intention and endeavor of this division to see each supply once a year and the larger, and especially the purification plants, oftener.

When in a given city, private water supplies, swimming pools, ice fields and tourist camps are visited in addition to the public structures, including city sewers.

In 1917 the law providing for regular inspections and analyses of public water supplies was passed and the work started in July of that year. Under this law the State Board of Health is given authority to assess an annual fee against each city or town having a supply. The following schedule was put into effect:

Source of water supply—

Ground—(springs and wells)

Population	Annual Fee	Number of such in Montana
Under 500.....	\$12.50	17
500-1,000.....	20.00	14
1,000-2,000.....	25.00	8
2,000-3,000.....	30.00	3
3,000-5,000.....	35.00	
5,000-15,000.....	40.00	3
15,000 and up.....	50.00	

Surface—(streams, lakes)

Population	Annual Fee	Number of such in Montana
Under 1,500.....	\$30.00	29
1,500-3,000.....	50.00	6
3,000-6,000.....	90.00	4
6,000-10,000.....	100.00	2
10,000 and above.....	150.00	6

These fees have brought to the general fund between \$3,600.00 and \$4,000.00 a year. This money is appropriated by the legislature for the use of the Division. While this is not adequate to finance the Division in all its activities, it has been of material assistance. It has made possible a regular schedule of inspections and laboratory analyses which has had a marked effect in bringing our supplies to their present quite satisfactory sanitary condition. There are now thirty-six liquid chlorine plants in constant use on water supplies. Two supplies are still treated with calcium hypochlorite. There is treatment of sewage with chlorine in two instances.

The emergency liquid chlorine plants available from our office have been called into use three times during the past two years to avert possible epidemics because of unusual contamination of water. One was set up for this purpose at the state school for the Deaf and Blind at Boulder in September, 1931, where the water had become excessively low in the creek and the well water was found to show contamination. A permanent installation should be made to treat the water of South Boulder Creek at least during the summer season, and the well water should be treated whenever it is used.

Another installation was made at Choteau in June, 1932 where conditions about the city water supply had become such as to produce contamination. Conditions were remedied at this place and since then the water has been free from contamination.

An installation was made at Glacier Park July 19, 1932, to disinfect the water of Midvale Creek which supplies the large hotel, the railroad, and some of the people in the village. The water of the creek had become contaminated because of the presence of a crew which had established a sawmill above the intake. These men were taken off of the watershed immediately and the area was cleaned up. However, the installation was maintained until the end of the season. Recommendations for permanent disinfection, if this particular supply is to be continued, have been made.

Before the close of the last biennial period, the State Board of Health had had occasion to install its emergency liquid chlorine plant at Harlowton on the city water supply because of contamination which had reached the city wells. It was not until after the close of that period that the source of that trouble was definitely located. The sources of this particular public water supply are strata lying at various depths below the surface. No record of the geological formations through which these wells were drilled had been kept. However, the sources of the contamination proved to be a number of cesspools in that part of the city not served by the common sewers. Deep wells which had at one time furnished drinking water but had been discontinued upon the construction of the municipal supply, were being used as cesspools. The particular dip of the stratified rock in that locality carried the contamination to one well, the casing of which had recently been perforated at a level in which the

driller had remembered finding water. A permanent chlorine installation has been made and the cesspools were discontinued.

Dr. E. S. Perry, Geologist of the State School of Mines in Butte, was called into consultation on this situation and rendered valuable service in determining the character of the underlying strata in this vicinity.

### REGISTRATION OF DRILLERS OF WATER WELLS

It was only because of the fortunate circumstance that one of the operators of the Harlowton city water supply is a well driller and had drilled at least one of the city wells that any knowledge of the detail of construction was available.

About this time, also, it was learned that a well had been drilled for one of the state institutions in Montana, but that no record whatever, except total depth, had been kept. It has been constantly embarrassing to attempt intelligent investigations and interpretation of analytical data obtained from water drawn from drilled wells all over the state because of the lack of reliable detailed information concerning them. A plan was, therefore, conceived whereby the State Board of Health would be given the significant information concerning drilled wells at the time the wells were drilled, and a measure was drawn for presentation to the legislature meeting in 1931. A copy of this measure follows:

SECTION 1. For the purpose of preserving the health of the public and to provide the State Board of Health with relevant information pertaining to water supply when obtained from water wells used for furnishing water, directly or indirectly, to or for public consumption or use, it is hereby made the duty of every person, firm or corporation, drilling or causing to be drilled any water well within the State of Montana, intended for use or actually used in furnishing water, directly or indirectly, to or for public consumption or use, to keep a complete and accurate record of the depth and thickness and character of the different strata penetrated in the drilling of any such well, together with such other pertinent information concerning said water well and the drilling thereof as the said Board of Health may by rule or regulation require, such data to be furnished to the said Board upon forms prescribed and furnished by it.

SECTION 2. Such information as is required by said Board under the provisions hereof shall constitute public records and as such be available to the public at all reasonable times.

SECTION 3. Any person, firm or corporation, violating the provisions of this Act, or rules and/or regulations prescribed pursuant hereto or the lawful orders of the State Board of Health under such rules and regulations shall be deemed guilty of a misdemeanor and shall, upon conviction thereof, be punished by a fine of not more

than One Hundred (\$100.00) Dollars, or by imprisonment in the county jail for a period of not more than thirty (30) days, or by both such fine and imprisonment.

SECTION 4. All acts and parts of acts in conflict herewith are hereby repealed.

SECTION 5. This Act shall be in full force and effect from and after its passage and approval.

No trouble was experienced in securing the passage of this measure and it went into effect upon its approval by the Governor. The following rules and regulations were immediately drawn and adopted by the State Board of Health:

"1. Every person, firm or corporation drilling or causing to be drilled any water well within the State of Montana intended for use or actually used in furnishing water directly or indirectly, to or for public consumption or use, shall register his or their name with the State Board of Health at Helena, Montana, and secure from said State Board of Health a registration card and number. (No fee is charged for this registration.)

2. Every person, firm or corporation to whom the law and these regulations apply shall keep a full and true record of each well drilled and shall set such record down upon blanks furnished for the purpose by the State Board of Health. This record shall be filed with the State Board of Health at Helena, and a copy with the owner of the well immediately upon the completion of the work. This record shall be made from daily notes kept by those doing the drilling.

3. Each person, firm or corporation to whom the law and these regulations apply, shall, before commencing work, give notice to the State Board of Health at Helena of his or their intention of drilling a well for the purpose stated above."

Necessary forms for registration and submitting of the necessary information were distributed to all known well drillers, and as a consequence ninety-one drillers of water wells have been registered. Logs of 129 wells have been received and the information being collected through this means is gratifying and shows a clear justification for the measure.

#### **CERTIFICATION OF PUBLIC WATER SUPPLIES FURNISHED ON COMMON CARRIERS.**

This work is carried on in cooperation with the U. S. Public Health Service. Heretofore the director of the division, as collaborating sanitary engineer, has been allotted \$250.00 a year from the U. S. Public Health Funds for travel expenses connected with this work.

No specific amount has been allotted for the present fiscal year, but the director is, from time to time, traveling on money from this source. Inasmuch as our principal cities are points at which the trains of one or more railroads are watered, this arrangement is very convenient and helpful. The certificate is based upon standards set up by the U. S. Public Health Service applying to the quality of the water and the conditions in the physical plant. We are able to recommend certificates for all of the thirty-four points listed by the various railroads, although four or possibly five of these are Provisional.

### **SANITARY CONDITIONS AT THE STATE FAIR GROUNDS**

It is the custom of the State Board of Health, with the county health officer, to inspect each year the sanitary conditions at the State Fair Grounds during the State Fair. Heretofore unsatisfactory conditions have been observed, especially as regards the disposal of sanitary sewage. The facilities were obsolete and inadequate. In 1929, largely because of the recommendations of the state and county boards of health, the State Fair Board constructed a concrete septic tank for the collection and treatment of the sanitary wastes from a part of the State Fair Grounds which were equipped with up-to-date facilities. The State Board of Health has furnished and operated a liquid chlorine plant to disinfect the effluent from the tank during the State Fairs and Race Meets since. This system has worked very satisfactorily and it is hoped that the State Fair Board will in time be able to extend the sewer system to serve all parts of the grounds.

### **AMERICAN WATER WORKS ASSOCIATION**

The Director of the Division has sponsored the formation of the Montana Section of the American Water Works Association. There are now about twenty-five water works managers and superintendents in the state who are active members. The eighth annual meeting will be held in Havre in 1933. At these meetings members give papers on subjects drawn from their own experience in Montana. Seven of these papers have been published in the Journal of the American Water Works Association and have thus been given wide circulation.

The Board of Directors of the American Water Works Association is composed of representatives from each section. Besides being Secretary of the Montana Section, I have also been a director in which capacity I met with the Board last winter in New York City and plan to attend again this coming winter.

### **SCHOOL FOR WATER WORKS OPERATORS**

The first school for water works operators in Montana was held at the Montana State College, March 30-31, 1932. The school was organized by the Division of Water and Sewage of the Montana

State Board of Health, and the Department of Chemical Engineering of the Montana State College, with the cooperation of the Department of Bacteriology of the State College.

The program of the school was organized along the lines of regular classroom procedures. Instruction was offered in the form of lectures, exhibits, lantern slides, experiments, assigned problems, and laboratory exercises. Organized along pedagogical lines, the meeting was therefore a school and not a convention. The purpose of the instruction was to lay a sound foundation of scientific facts and theories pertaining to water works operation.

Each delegate was furnished with mimeographed lecture outlines. Each lecture was accompanied by ample experiments and demonstrations. One of the high lights of the meeting was the attendance of Mr. George W. Pracy, President of the American Water Works Association. Mr. Pracy took part in all the discussions, and his presence and talks constituted a very important contribution to the success of the school. The attendance was highly satisfactory. In addition to the instructional staff and others already mentioned, there were representatives from a large number of the water works plants of the state and the representatives of a number of industrial concerns. There were three water works officials in attendance from a neighboring state.

It seems safe to state that the representatives of the State Board of Health and the Montana State College would be pleased to consider the school as an annual event. The second school is planned for Havre in April, 1933. As one direct result of the school a complete laboratory has been established in the water filtration plant at Billings.

#### IMPROVEMENTS NOTED

The past two years have seen no large development in the water works or sewage disposal fields in Montana. There has, however, been a steady improvement in the state, the present supplies being maintained in a quite satisfactory condition. In the aggregate, a relatively large amount of money has been spent for replacements and new equipment and some extensions. There have been at least sixteen new wells drilled or dug for new or additional water supplies and eleven new pump installations have been made. For the treatment of water, installations have been made in nine situations, whereby ammonia in conjunction with chlorine is now applied. In Forsyth an entirely new water filtration plant of the rapid sand mechanical type has been built. In Great Falls additions have been made to the existing plant. Some new reservoirs have been built and present storage capacity increased. One entirely new water supply for public use has been inaugurated. This is at Deer Lodge, where the municipality has contracted for the construction of a supply from wells, a storage reservoir of 600,000 gallon capacity and an iron distribution system.

## FINANCING SEWAGE DISPOSAL

### Sewer Rentals.

We are constantly making attempts to improve the conditions of sewage disposal and stream pollution in Montana. We are handicapped, however, in that so few of our communities have adequate facilities for proper treatment. One reason for this is the lack of proper financing. The laws of Montana give city councils and owners of public water supplies authority to collect revenue from the sale of water to consumers, thus creating a substantial and reliable income from which money for all expenses of operation and construction may be drawn. This utility is thus self-supporting. This is not true in the case of sewage disposal. Direct taxation is the only source of revenue for this purpose. It is not to be wondered at, therefore, that our city councils have been slow to expend much money on this feature of municipal sanitation.

We propose to have introduced and to sponsor through the next legislature an act which will enable our municipal corporations through their councils, by ordinance, to levy a service charge on users of the public sewage disposal system. By this means it will be possible for these governing bodies to obtain sufficient income for the construction of proper treatment plants and for their intelligent operation. There are twenty-nine states which have already adopted this plan of financing sewage disposal. The Montana Section of the American Water Works Association, after thorough study of the matter, has approved of this plan.

## CHEMICAL CHARACTERISTICS OF PUBLIC WATER SUPPLIES IN MONTANA

There is presented herewith a tabulation showing alkalinity (carbonate or bi-carbonate), total hardness (as calcium carbonate), sulphate ( $\text{SO}_4$ ), iron (Fe), calcium (Ca) and Magnesium (Mg) of the public water supplies in Montana. Obviously it is not possible to give results of sufficient analyses to show these features over a long period during which some waters may vary considerably. There has been, however, an attempt to so classify the supplies as to show if the figures given represent a fairly constant condition or one which varies through relatively narrow or wide limits. Well and spring waters show relatively constant characteristics. Waters from smaller streams vary through narrow limits, while those from our larger streams may vary widely. For this reason the date of analysis in this group is given. The variations appear through the seasons, hardness and alkalinity being consistently higher in the fall and winter and lower in the spring and summer when surface waters (rains and melting snows) dilute the more constant sources. The hardness given in the tabulation is calculated from the calcium and magnesium.

## GROUP I.

Constituents Relatively Constant

City	Alkalinity p.p.m. <sup>2</sup>	Total Hardness p.p.m.	Sulphates p.p.m.	Iron p.p.m.	Calcium p.p.m.	Mag- nesium p.p.m.
Armstead (well).....	159.0	172.0	56.0	.....	46.4	13.7
Baker (well).....	211.0-1	trace	668.0	.....	trace	trace
Belgrade (well).....	189.0	221.0	51.0	neg.	64.0	11.0
Belk (well).....	274.0	341.0	108.0	neg.	97.6	24.0
Big Fork (well).....	125.0	128.0	20.0	neg.	26.0	8.5
Big Sandy (well).....	40.0	318.0	44.0	trace	95.0	19.0
Big Timber (well).....	70.0	61.0	7.6	neg.	16.0	5.0
Boulder (well).....	55.0	161.0	62.0	0.3	28.0	7.2
Broadview (springs).....	560.0	540.0	123.0	neg.	117.0	61.0
Broadview (well).....	671.0	260.0	155.0	neg.	33.3	43.0
Browning (well).....	345.0	145.0	232.0	2.8	58.2	0.6
Cascade (springs).....	220.0	180.0	30.0	.....	54.0	11.0
Cascade (well).....	382.0	332.0	57.0	neg.	92.0	20.0
Chester (well).....	717.0	74.0	1867.0	.....	19.0	7.0
Choteau (well).....	278.0	301.0	18.0	.....	81.0	24.0
Columbia Falls (springs).....	216.5	132.0	11.3	neg.	30.3	13.6
Conrad (wells).....	436.0	275.0	140.0	neg.	64.0	28.0
Deer Lodge (well).....	177.0	123.0	32.0	.....	35.0	8.7
Deer Lodge.....	.....	.....	.....	.....	.....	.....
State Prison (well).....	177.0	145.0	60.0	.....	35.7	13.5
Denton (springs).....	302.0	331.0	78.0	neg.	67.6	40.0
Dodson (well).....	305.0	278.0	279.0	.....	85.0	16.0
Galen (springs).....	247.0	246.0	33.8	.....	65.0	17.5
Galen (well).....	233.0	188.0	57.2	3.0	64.7	6.5
Gallatin Gateway (well).....	273.0	198.0	49.5	.....	65.0	11.0
Geraldine.....	.....	.....	.....	.....	.....	.....
Winchell Spr.).....	381.0	736.0	382.0	neg.	145.0	43.0
Geraldine (Clark Spr.).....	229.0	190.0	93.0	.....	50.0	18.9
Geraldine (South Spr.).....	271.0	362.0	226.0	neg.	90.0	28.0
Glasgow (well).....	393.0	340.0	348.0	.....	85.0	31.0
Harlowton (well No. 1).....	671.0	35.0	270.0	.....	11.0	trace
Harlowton (well No. 2).....	549.0	52.0	290.0	.....	16.0	3.0
Havre (well No. 1).....	404.0	354.0	280.0	neg.	76.0	40.0
Havre (well No. 2).....	488.0	345.0	234.0	neg.	74.0	39.6
Havre (well No. 3).....	555.0	249.0	438.0	neg.	50.0	23.0
Helena (Bedrock well).....	275.0	245.0	29.0	.....	62.0	22.0
Helena (Eureka well).....	256.0	221.0	36.0	.....	55.0	26.0
Helena.....	.....	.....	.....	.....	.....	.....
Idaho (ground water).....	191.0	181.0	42.0	neg.	51.0	13.0
Helena (Woodston well).....	280.0	274.0	57.0	neg.	54.0	34.5
Hinsdale (well).....	712.0	679.0	1050.0	.....	152.0	73.0
Hysham (well).....	261.0	301.0	225.0	.....	91.0	18.0
Judith Gap (well).....	421.0	202.0	754.0	.....	43.0	23.0
Kalispell (springs).....	195.0	124.0	102.0	neg.	33.0	10.6
Kevin (springs).....	281.0	272.0	148.0	.....	66.0	26.0
Lewistown (springs).....	195.0	343.0	160.0	.....	91.0	28.0
Lima (springs).....	225.0	213.0	22.0	.....	64.6	13.6
Malta (well).....	464.0	544.0	570.0	neg.	119.0	60.0
Manhattan (springs).....	250.0	255.0	79.0	neg.	77.0	19.0
Medicine Lake (well).....	323.0	229.0	167.0	.....	54.0	23.0
Melstone (well).....	592.0	1495.0	1734.0	.....	252.0	148.0
Miles City (St. Industrial School for Boys, well).....	782.6-2	45.0	717.0	neg.	8.0	6.0
Moore (well).....	241.0	255.0	7.0	.....	74.0	22.6
Musselshell (well).....	448.0	208.0	520.0	.....	55.0	39.0
Paradise (well).....	150.0	148.0	39.0	neg.	43.0	11.0
Philipsburg.....	.....	.....	.....	.....	.....	.....
(Kirkville Spr.).....	143.0	41.0	90.0	.....	13.0	2.9
Philipsburg.....	.....	.....	.....	.....	.....	.....
(Algonquin Spr.).....	46.0	39.0	11.0	.....	14.0	1.0
Plains (well).....	162.0	141.0	6.0	neg.	40.0	16.0
Plains (springs).....	46.0	32.0	4.0	.....	8.0	3.0
Plentywood.....	.....	.....	.....	.....	.....	.....
(Fire Hall well).....	653.0	776.0	576.0	.....	138.0	105.0
Plentywood.....	.....	.....	.....	.....	.....	.....
(New City well).....	604.0	852.0	535.0	.....	175.0	101.0
Plentywood (South well).....	957.0-3	47.0	544.0	.....	4.0	9.0
Poplar (well).....	361.0	130.0	167.0	.....	27.0	15.0

City	Alkalinity p.p.m. <sup>2</sup>	Hardness p.p.m.	Sulphates p.p.m.	Iron p.p.m.	Calcium p.p.m.	Mag- nesium p.p.m.
Rexford (well).....	53.0	230.0	60.0	neg.	53.0	24.0
Great Northern						
Roundup (well).....	354.0	511.0	147.0	neg.	109.0	58.0
Ryegate (well).....	345.0	480.0	380.0	.....	148.0	45.0
Saco (well).....	549.0	735.0	1378.0	.....	171.0	75.0
Seehey (well).....	637.0	227.0	207.0	.....	43.0	29.0
Shelby (well).....	241.0	328.0	205.0	.....	85.0	28.0
Sidney (well).....	430.0	498.0	325.0	.....	85.0	69.0
Stanford (well).....	314.0	109.0	101.0	.....	29.0	9.0
Stevensville						
(ground water).....	162.0	120.0	5.0	.....	29.0	12.6
Superior (spring).....	232.0	214.6	11.0	.....	11.0	27.0
Sunburst (wells).....	400.0	516.0	549.0	.....	118.0	54.0
Three Forks (well).....	278.0	21.0	62.0	.....	6.4	1.3
Trident (well).....	229.0	210.0	69.0	neg.	53.0	19.0
Twin Bridges						
city well.....	225.7	308.0	143.0	neg.	74.0	30.0
Twin Bridges						
Orphan's Home.....	98.0	90.0	24.0	neg.	26.0	6.0
Valley (well).....	433.0	285.0	65.0	.....	68.0	28.0
Virginia City (springs).....	153.0	134.0	11.0	neg.	31.0	12.6
Warm Springs						
(ground water).....	185.0	238.0	85.0	.....	69.0	16.0
West Yellowstone (well).....	33.0	30.0	8.0	neg.	12.0	trace
O. S. L. Ry. Co.						
Whitehall (well).....	210.0	304.0	140.0	.....	89.0	26.0
Wibaux (well).....	494.0	448.0	530.0	neg.	85.6	48.0
Winnett (wells).....	106.0	819.0	850.0	.....	134.0	118.0
Wolf Point (well).....	555.0	429.0	752.0	.....	111.0	37.0
Wolf Point (well).....	479.0	546.0	882.0	.....	71.0	41.0
1-Carbonate (CO <sub>2</sub> ).....	28.5					
2-Carbonate (CO <sub>2</sub> ).....	29.0					
3-Carbonate (CO <sub>2</sub> ).....	6.0					
4-Carbonate (CO <sub>2</sub> ).....	21.0					

## GROUP II.

Constituents vary through narrow limits

City	Alkalinity p.p.m.*	Total Hard- ness p.p.m.	Sul- phates p.p.m.	Iron p.p.m.	Calcium p.p.m.	Mag- nesium p.p.m.	Date of Analysis
Anaconda (Reservoirs).....	30.0	35.0	15.0	.....	9.4	3.0	October
Bear Creek (Bear cr.).....	143.0	112.0	20.0	.....	28.4	10.0	December
Belgrade (creek).....	174.0	152.0	12.0	.....	41.0	12.0	November
Bozeman (Bozeman cr.).....	153.0	108.0	9.0	.....	27.0	10.0	February
Bozeman (Lyman cr.).....	192.0	172.0	21.0	.....	41.0	17.0	February
Boulder (creek).....	36.6	50.0	21.1	0.8	12.3	4.6	November
Butte (Basin creek).....	76.0	59.0	28.0	neg.	17.0	4.0	February
Butte (Moulton, Creek).....	64.0	49.0	56.0	neg.	18.0	1.0	February
Cut Bank (Cut Bank cr.).....	247.0	199.0	164.0	.....	50.0	18.0	February
Deer Lodge (.....)	125.0	134.0	47.0	.....	37.0	10.0	May
(Cottonwood creek)							
Deer Lodge (Tin Cup cr.).....	79.0	17.0	18.0	.....	trace	4.0	June
Dillon (.....)	101.0	80.0	10.0	.....	22.0	6.0	January
(Rattlesnake creek)							
East Helena (.....)	51.0	82.0	29.8	neg.	19.2	8.3	November
(McClellan creek)							
Eureka (Sinclair cr.).....	207.0	165.0	8.0	.....	19.0	11.0	November
Hamilton (Skalkaho cr.).....	128.0	101.0	6.0	.....	27.0	8.0	November
Libby (Flower cr.).....	46.0	48.0	11.0	.....	10.0	5.0	March
Phillipsburg.....	15.3	16.5	8.4	neg.	0.3	3.8	May
(South Boulder cr.)							
Polson (.....)	40.0	40.0	19.0	.....	16.0	neg.	October
(Hell Roaring cr.)							
Rexford (Sullivan cr.).....	131.0	110.0	4.0	.....	34.0	6.0	February
Ronan (Crow creek).....	46.0	42.0	neg.	neg.	11.0	3.3	April
Saco (surface stream).....	214.0-1	228.0	142.0	.....	17.0	27.0	July
Sheridan (Indian cr.).....	82.0	79.0	40.0	.....	22.0	6.0	March
Somers (Flathead Lake).....	796.0	383.0	15.0	.....	74.0	48.0	November
Stevensville (.....)	101.0	102.0	16.0	trace	30.4	6.3	May
(Burnt Fork creek)							
Thompson Falls (.....)	134.0	96.0	trace	.....	27.6	6.6	January
(Ashley creek)							
Townsend (Deep creek).....	259.0	254.0	57.0	neg.	68.0	21.0	September
Troy (O'Brien creek).....	104.6	65.5	10.9	neg.	23.0	6.9	February
Whitefish (creek).....	107.0	104.0	6.5	neg.	30.4	6.8	January
Whitefish (Lake).....	119.0	82.0	17.0	neg.	23.0	6.0	June
Great Northern Ry. Co.							
White Sulphur Springs.....	88.0	41.0	36.0	neg.	12.0	2.6	February
(Willow creek)							

1-Carbonate ( $\text{CO}_3$ ) 4.5

**GROUP III.**  
 Constituents may vary widely

City	Alka- linity p.p.m.*	Total Hard- ness p.p.m.	Sul- phates p.p.m.	Iron p.p.m.	Calcium p.p.m.	Mag- nesium p.p.m.	Date of Analysis
Anaconda (Warm Springs creek)	149.0	104.0	9.0	.....	30.0	7.0	October
Big Timber (Boulder R.)	171.0	167.0	26.5	.....	47.0	12.0	November
Billings (Yellowstone River)	159.0	230.0	134.0	.....	48.0	27.0	March
Bridger (Clarks Fork R.)	67.1	73.0	55.0	1.6	19.0	6.2	June
Butte (Big Hole R.)	104.0	71.0	26.3	neg.	19.4	5.4	February
Chinook (Milk River)	217.0	178.0	42.0	.....	45.0	16.0	August
Columbia Falls (Flathead River Soldier's Home)	137.0	114.0	9.0	.....	30.0	9.5	January
Columbus (Yellowstone River)	101.0	68.0	25.0	.....	14.0	8.0	July
Culbertson (Missouri R.)	207.0	234.0	104.0	.....	64.0	18.0	January
Forsyth (Yellowstone R.)	195.0	288.0	267.0	.....	87.0	17.0	March
Ft. Benton (Missouri R.)	232.0	246.0	110.0	.....	64.0	21.0	January
Fromberg (Clarks Fork R.)	216.6	378.0	312.0	.....	100.0	31.0	January
Gardiner (Yellowstone R.)	131.0	135.0	25.0	.....	44.0	6.0	November
Glendive (Yellowstone River)	189.0	326.0	291.0	.....	68.0	38.0	March
Great Falls (Missouri River)	177.0	117.0	57.0	neg.	22.0	15.0	September
Hardin (Big Horn R.)	232.0	375.0	375.0	.....	96.0	33.0	November
Harlem (Milk River)	323.9	286.0	208.0	.....	57.0	35.0	November
Helena (Ten Mile cr.)	27.0	32.0	29.0	.....	8.0	3.0	July
Joliet (Rock Creek)	406.0	209.0	166.0	.....	67.0	32.0	March
Laurel (Yellowstone R.)	140.0	149.0	42.0	.....	27.0	18.0	August
Livingston (Yellowstone River)	89.0	84.0	46.0	.....	27.0	4.0	June
Miles City (Yellowstone River)	93.0	90.0	108.0	.....	36.0	trace	June
Missoula (Rattlesnake cr.)	37.0	24.0	27.0	neg.	3.0	4.0	February
Red Lodge (Rock creek)	31.0	29.0	11.0	.....	9.0	2.0	February
Three Forks (Madison R.)	1131.0	101.0	16.0	.....	27.0	8.2	May

\* To convert to grains per gallon, divide by 17.1

## HYGIENIC LABORATORY BIENNIAL REPORT 1931-1932 (Ending October 31)

FRED STIMPert, Director

The outstanding fact in the report of the Hygienic Laboratory is the sustained volume of the routine work which approximates that of the preceding two year period, the specimens examined totaling 35,931. In view of the marked decrease in such communicable diseases as diphtheria, due almost entirely to extensive immunization of children, the records demonstrate that the service of the laboratory is being used by the physicians to a more diverse extent in seeking diagnostic aid, not only in the emergency case but in caring for the general health of the people. A marked increase is shown in the number of examinations for enteric diseases. 1150 Widal's were done on blood specimens and 350 feces and urine examinations were made—345 bloods were found to be positive with *B. typhosus* and 12 with *B. paratyphosus*, in 39 stools *B. typhosus* was isolated. Examinations for undulant fever have increased from 94 to 201 with 11 positive cases found.

An increased demand for animal inoculations has been noted, especially for the diagnosis of tuberculosis—92 guinea pigs were inoculated with urine, sputum and exudates and examined, as compared with 30 in 1929-30. Spinal fluid examinations have increased from 464 to 555. For tuberculosis sputum examinations have increased from 1487 to 1817, smears for gonorrhea from 2334 to 2727, and stool specimens for ova and parasites from 19 to 100. Twelve cases of tularemia were diagnosed by agglutination tests out of 91 specimens of blood sent in.

Details of special work undertaken are given in the following section of the report. These investigations have not only led to important observations and determinations, improvement in procedures, but also have suggested new problems for future study.

### Research and Special Investigations

The changes made in the Wassermann test four years ago have been under close check and observation. These changes were made in accordance with requirements considered as necessary for accuracy and standardization submitted by the Committee on Standard Methods of the American Public Health Association. Records of over 40,000 tests completed up to the present time in our regular routine work show that these changes were essential and have greatly increased the reliability of the tests. This aim in the standardization of Laboratory Methods has been carried out in all our routine laboratory procedures in so far as our working conditions will permit.

The study of the complement fixation in tuberculosis is being carried on and up to date have completed 1191 tests. An improved antigen has given better results. The results have been extremely interesting and a plan for the future is being worked out with the

Indian Service to make a detailed study of the value of the test in relation to clinical and X-ray findings and the Mantoux test with groups of Indians.

With the new preparation of an antigen for use in the complement fixation test for Gonorrhea much more accurate and reliable results have been obtained in the diagnosis of gonorrheal infection. Reports of the use of this antigen in other laboratories, as have been tested with clinical cases, show most satisfactory results.

Because of the unreliable and irregular results occurring in the microscopic Widal test using dried blood the laboratory is preparing to institute as a routine procedure a macroscopic test using dead bacterial strains as antigens with the hope of distinguishing the H and O type of agglutination and giving a possible indication as to whether the positive agglutination might mean typhoid fever, antibodies present due to prophylactic vaccination, or infections other than typhoid.

A case of suspicious undulant fever which did not give typical agglutination with *B. abortus* was investigated and finally determined two weeks before death by blood cultures taken on liver infusion agar. In the early stage of the disease an agglutination of 1-80 was noted but in succeeding tests for a period of about two months no further agglutination was found. Records indicate that in severe and fatal cases the agglutination titre very often is not as high as in the usual typical non-fatal cases, and this factor provides difficulty in making a diagnosis unless the organism can be recovered by culture.

Two cases of actinomycosis were diagnosed by examination of pus and skin scrapings. These two cases occurred in the same family; the father, with primary lesion on the chin and later extending into the neck tissue with abscess formation; the boy with simple skin lesions. True etiological relationship was not determined but it is presumed to have been contracted from cattle with which both cases were in contact.

An interesting case of blastomycosis was also determined by laboratory findings of both budding and typical mycelial forms. The case was a boy about 14 years old who had some contact with cattle. In an investigation of the cattle a calf was found with peculiar skin lesions. Scrapings from these lesions were examined and the same mycelial forms were found. The etiological study in this case was extremely valuable in the fact of the occurrence in cattle and the relation to human infection.

#### **Lectures, Papers and Educational Work**

Papers were given to two different county medical societies, a paper at the meeting of the State Health Association, and one given to the State Embalmers Institute.

Talks were given to a group of college students and a group of high school students.

Three series of lectures on General Bacteriology have been given to nurses in hospital training schools.

453 letters have been written in regard to laboratory work and procedures and information concerning the interpretation of laboratory findings.

Three series of stained microscopic slides of various bacterial forms have been prepared and sent to schools to be used in demonstrations.

Two persons, with previous training, have spent time from two to six months in the laboratory to study procedures.

### **Future Work**

A plan of study of a comparison in the colloidal gold reaction with the Colloidal Benzoin test in examination of spinal fluids is being made. Results so far are not sufficient to report. The Colloidal Benzoin test is much simpler to prepare and set up, an accurate stable solution being easily prepared, and is probably more sensitive in its reaction.

A laboratory manual is being prepared for publication and will be sent to physicians, giving in detail the nature of our laboratory work, information in the collection and preparation of specimens for transportation, relation of specific laboratory procedures to possible clinical conditions and interpretation of laboratory results.

# **HYGIENIC LABORATORY** **REPORT OF LABORATORY EXAMINATIONS**

**November 1930 to November 1932**

## **BLOOD EXAMINATIONS**

Syphilis, Wasserman reaction .....		21,819
Pos .....	2275	
Neg .....	18797	
Unsat .....	747	
Gonorrhea, Complement Fixation test .....		244
Pos .....	59	
Neg .....	185	
Tuberculosis, Complement Fixation test.....		790
Pos .....	259	
Neg .....	531	
Typhoid, Widal reaction .....		1157
Pos .....	345	
Neg .....	811	
Unsat .....	1	
B. paratyphosus "A" .....		1150
Neg .....	1150	
B. paratyphosus "B" .....		1156
Pos .....	12	
Neg .....	1138	
Tularemia, agglutination test .....		91
Pos .....	12	
Neg .....	79	
Undulant Fever, agglutination test .....		201
Pos .....	11	
Neg .....	190	
Blood cultures.....		34
Sugar .....		35
Color Index.....		1
Dark Field.....		1
Coagulation time .....		7
Grouping .....		28
Matching .....		19
Hemoglobin .....		113
Cell Count.....		145
Differential .....		101
Malaria .....		6
Guinea Pig Inoculation, Jaundice .....		8
Cows' Blood, Complement Fixation test,		
Tuberculosis .....		82
Pos .....	60	
Neg .....	22	

## **SPINAL FLUID EXAMINATIONS**

Wassermann reaction .....		505
Pos .....	56	
Neg .....	447	
Unsat .....	2	
Tuberculosis, Complement Fixation test.....		7
Neg .....	7	
Bacteriological .....		43
Pos .....	6	
Neg .....	37	

Colloidal Gold.....	274
Globulin.....	61
Cell Count.....	32
Sugar.....	7
Guinea Pig Inoculation.....	2
<b>THROAT CULTURES</b>	
Diphtheria.....	1231
Pos.....	197
Neg.....	1026
Unsat.....	8
Hemolytic Streptococci.....	507
Pos.....	109
Neg.....	194
Virulence Test.....	1
Pos.....	1
Other Organisms.....	103
<b>SMEARS, SLIDE EXAMINATIONS</b>	
Gonorrhea.....	2727
Pos.....	629
Neg.....	2094
Unsat.....	10
Vincent's Angina.....	183
Pos.....	141
Neg.....	40
Unsat.....	2
Miscellaneous.....	150
<b>SPUTUM EXAMINATIONS</b>	
Tuberculosis.....	1847
Pos.....	198
Neg.....	1605
Unsat.....	44
Organisms.....	8
Guinea Pig Inoculation.....	11
<b>TRANSUDATE AND EXUDATE EXAMINATIONS</b>	
Bacteriological.....	65
Chemical.....	5
Guinea Pig Inoculation.....	9
<b>FECES EXAMINATIONS</b>	
<i>B. typhosus</i> .....	352
Pos.....	39
Neg.....	277
Unsat.....	16
Ova and Parasites.....	190
Dysentery.....	3
Tuberculosis.....	1
Cholera.....	1
Blood.....	2
Fats.....	2
<b>URINE EXAMINATIONS</b>	
Microscopic.....	227
Chemical.....	227

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Guinea Pig Inoculation.....	66
B. Typhosus.....	6
Neg .....	6
Gonococci .....	8
Organisms .....	20
Autogenous Vaccine.....	50
Breast Milk, analysis .....	44
Breast Milk, organisms.....	2
Gloves, sterility test.....	1
Gauze, sterility test.....	5
Sponges, sterility test .....	5
Water, organisms.....	18
Skin scrapings, Fungi .....	1
Skin scrapings, Actinomyces.....	3
Skin scrapings Blastomycosis .....	1
Meat, Guinea Pig Inoculation, Botulinus .....	1
Pickles, Guinea Pig Inoculation, Botulinus.....	1
Experimental Widal .....	40
	<hr/>
TOTAL .....	35,931

## CONTAINERS DISTRIBUTED

Wasserman	Containers	11925	
	Bottles	18808	
		<hr/>	30733
Diphtheria	Containers	1042	
	Tubes	2651	
	Swabs	2677	
		<hr/>	6370
Tuberculosis	Containers	1943	
	Bottles	1953	
		<hr/>	3896
Gonorrhea	Containers	1938	
	Slides	4175	
		<hr/>	6113
Feces	Containers	333	
	Bottles	333	
		<hr/>	666
Widal Cards			785
Agar Slants			33
			<hr/>
TOTAL .....			48,596

**BIENNIAL REPORT OF THE FOOD AND DRUG DIVISION****November 30, 1930, to November 30, 1932****J. W. Forbes, Director****W. M. Cobleigh, Consultant**

The purpose of the Food and Drug Division of the Montana State Board of Health is to protect the health of the people by securing for them pure foods and drugs that are not adulterated nor misbranded nor handled or served under insanitary conditions. The accomplishment of this purpose is done by:

1. Enforcement of the Pure Food and Drug Acts of 1911.
2. Collection of samples of foods and drugs for laboratory analysis to determine whether or not they comply with the law.
3. Licensing of food manufacturing and food handling establishments as required by law.
4. Enforcement of the Rules and Regulations of the State Board of Health adopted under the authority granted the Board by law.
5. Cooperation with local and county health officers in making inspections.
6. Cooperation with federal authorities in the control of interstate shipments of foods and drugs.

**INSPECTIONS**

Inspections of all food handling and food manufacturing establishments for sanitary conditions are made for the most part by local health officers or sanitary inspectors. Inspection score cards are furnished by this department for scoring establishments at such times as they are inspected. These inspection score cards are then forwarded to this department. Any insanitary conditions noted are taken up with the operators of the food handling establishment for correction. This gives a good check on general conditions for the state as a whole.

- 10,291 inspection cards were returned in 1929.
- 12,229 inspection cards were returned in 1930
- 12,128 inspection cards were returned in 1931
- 11,804 inspection cards were returned in 1932.

Numerous inspections are made for which no cards are returned. The best cooperation is in those districts having full-time county health units and sanitary inspectors. The majority of the health officers cooperate very well where they have time to devote.

As a rule a representative from this department visits each licensed establishment once a year in company with the local health officers. Whenever possible, visits are made more often to the larger cities. Often the state officers are called in to assist the local

men in situations which the local officers have difficulty in controlling.

Inspections were made by state officers of 5,000 establishments in the past two years.

### LICENSES

A separate license issued by the State Board of Health is required for each of the classes of business listed below:

1. Public eating places.
2. Meat markets.
3. Manufacturing bakeries and delicatessens.
4. Manufacturing confectioneries.
5. Soda fountains, ice cream parlors and soft drink establishments.
6. Bottling works.
7. Canneries.
8. Tourists camps.

These licenses are secured upon application and payment of a fee of two dollars per license. All licenses expire on December thirty-first of the year issued. Fees are turned in to the State Treasurer and placed in the general fund. Since the enactment of the license provision of the law in 1921 the following licenses have been issued and fees collected:

1922, 2,974 licenses issued,	\$5,948 in fees collected.
1923, 3,064 licenses issued,	6,128 in fees collected.
1924, 2,923 licenses issued,	5,846 in fees collected.
1925, 3,128 licenses issued,	6,256 in fees collected.
1926, 3,460 licenses issued,	6,920 in fees collected.
1927, 3,868 licenses issued,	7,736 in fees collected.
1928, 4,105 licenses issued,	8,210 in fees collected.
1929, 4,268 licenses issued,	8,536 in fees collected.
1930, 4,290 licenses issued,	8,580 in fees collected.
1931, 4,203 licenses issued,	8,406 in fees collected.
1932, 3,951 licenses issued,	7,902 in fees collected.

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Total—eleven Years.....\$80,468.00

There has been a decrease in total number of licenses issued since 1930. This is to be expected because of the present financial situation. Although the total number of licenses sold has decreased, there have been a number of new places opening up. A recent check made through the health officers indicates that approximately five hundred places licensed last year are out of business this year.

Tourist camp licenses have been steadily increasing since the enactment of the law in 1929, placing tourist camps under the jurisdiction of the State Board of Health.

1929, 117 licenses issued,	\$234.00 in fees collected.
1930, 161 licenses issued,	322.00 in fees collected.

1931, 176 licenses issued, 352.00 in fees collected.  
1932, 186 licenses issued, 372.00 in fees collected.

Local health officers inspect these camps each month during the tourist season. The state inspector plans on visiting each one at least once a year. Because of the importance of the tourist trade, it is felt that this is an important phase of summer inspection work.

### PROSECUTIONS

It is not the policy of the State Board of Health to prosecute every violation of the Food and Drug Laws or Board of Health Rules and Regulations. However, continued infractions and disregard of warnings is considered as justifying prosecution.

During the past biennium, proceedings were instituted against seven establishments for selling adulterated hamburger, one establishment for undeclared preservative in carbonated beverages, and twenty-two establishments for failure to take out licenses.

Fines collected are turned in to the State Treasurer to be deposited in the general fund, as required by law.

### LABORATORY

The laboratory work of the Food and Drug Division is seriously curtailed by not having a full-time assistant in the Laboratory. Except as emergencies arise, the entire work of inspecting all food handling establishments and tourist camps in the state, of collecting samples of foods and drugs for analysis, of making all analyses in the laboratory, of cooperation with the Federal Food and Drug Administration, of supervising and checking the issuing of licenses, of cooperation with the local health officers in their sanitary work and of carrying on the necessary correspondence of the office is done by the director. All of this work is important for the enforcement of the Food and Drug Act and in the best interests of the health of the public. Since the laboratory work depends on the activity of the director in collecting samples, it is the one phase of the work that can be more or less regulated to the amount of time available.

Food samples analysed in the past biennium include: baking powder, tooth paste, canned cherries, cherry juice, peas, string beans, sauerkraut, pumpkin, beans with pork, corn, cheese, butter, ice cream, lard, vinegar, cider, olive oil, hamburger, sausage, wieners, coffee, corn starch, lemon extract, vanilla flavoring compound, bottled carbonated beverages, mineral food, mineral water, Grant's Hygienic Crackers, wheat crackers, puffles, oranges, home canned beef, home canned pork, catsup, oysters, celery, apples, pears, and cranberries.

Drug samples analysed include: Aspirin tablets, arsenic for purity, Crazy Crystals, ammonia, bluing, depilatories, liver salts

asthma relief, asthma and hay fever cure, cough and croup remedy, cough cure, and Dad Walcott's Lung Grease.

Materials examined for suspected food poisoning include: home canned pork, corn and beans; for poison: canned corn, sugar, cocoa, coffee and water; for narcotics: powder, tablets, bindles; for bromides: two kinds of tablets.

A summary of the laboratory analyses over the period of 1925 to 1933 is as follows.

1925-1926 Biennium	926 samples analysed
1927-1928 Biennium	1,401 samples analysed
1929-1930 Biennium	1,725 samples analysed
1931-1932 Biennium	1,069 samples analysed

In the summer of 1928 an assistant was employed for three months. In 1929-1930 an assistant was employed for seven months. During the biennium just passed no regular assistant has been employed, with the exception of six weeks in November and December, 1932, when one was employed to assist in combating the shipment from neighboring states into Montana for sale, of apples and pears carrying an amount of arsenic spray residue sufficient to be capable of causing injury.

The work of checking apple and pear shipments started October 4, 1932, when the director collected four samples of apples, three of which exceeded the federal tolerance for arsenic spray residue. The Federal Food and Drug Administration was consulted, resulting in the establishment in Montana of a Federal laboratory cooperating with the Food and Drug laboratory to analyse apple and pear samples which had been shipped or trucked interstate. This laboratory operated for one week in Missoula and two weeks in Helena. Since then the work has been carried on by the State Board of Health. The rush of work made necessary the appointment of a laboratory assistant for a six weeks period.

Samples were collected from 35,000 boxes of apples and 591 boxes of pears. Of the apples, 6,600 boxes, or 18.5%, had an excessive amount of arsenic spray residue. Of the pears, 286 boxes, or 48%, exceeded the tolerance.

Of the total number of boxes of apples sampled, 32,000 came into the state by rail shipment and 3,100 by truck. Of the rail shipments, 18% exceeded the tolerance and of the truck shipments 22.5%.

Of the apples and pears which carried arsenic spray residue in amounts sufficient to be capable of causing injury:

144 boxes of apples were destroyed.

10 boxes pears were destroyed.

1,916 boxes apples were held by dealers on state order until washed to reduce the arsenic below the tolerance.

3,000 boxes apples were seized by the federal authorities.

276 boxes pears were seized by the federal authorities.

90 boxes of apples were in truck shipments where the truck drivers gave fictitious addresses and trace of shipment; was lost before action could be taken.

1,450 boxes of apples exceeded the tolerance by a very small amount and no action was taken this year.

It is expected that next year the federal authorities will establish a branch laboratory earlier in the season to try and curtail the shipment of these products that exceed the federal tolerance. Also, action will be taken on all shipments which exceed the tolerance.

In cooperation with the Dairy Division of the Department of Agriculture, sixty analyses have been made of butter, ice cream and cheese.

In cooperation with the Water and Sewage Division of the State Board of Health, 187 chemical analyses were made of water. In addition to this laboratory work, 95 city water supplies and 13 sewage disposal plants were inspected by the director at such times as regular inspection trips were made. This has been a saving to the department in eliminating duplication of travel and expenses.

A considerable amount of time was devoted in March, 1932, in cooperation with Mr. H. B. Foote, Director, Division of Water and Sewage, in preparing a short course for use in a school for water plant operators held in Bozeman March 30th and 31st.

### SPECIAL INVESTIGATIONS

Since the Director of the Food and Drug Division spends considerable time in the field, there are a number of general problems investigated by him that concern the welfare of the people. Some of the special investigations made in the past biennium are listed:

Investigation of Dillon City dump ground.

Survey of method of handling biologicals in drug stores.

Railroad water supply at Whitetail.

Red Lodge city water supply.

Bear Creek city water supply.

Proposed town water supply at Hot Springs.

Proposed cannery for canning chicken and rabbit by cold pack method.

Check on fluid extract of ginger.

Possible mill site at Rimini.

Sugar factory waste disposal at Chinook.

Investigation of flour for short weight.

Investigation of suspected narcotics.

Sanitary conditions along Warm Springs Creek at Anaconda.

Mill waste disposal of I. B. Milling Company at Bannack.

Investigation of two deaths from botulism at Jordan.

### **FEDERAL COOPERATION**

The Food and Drug laws of Montana are patterned after the Federal Food and Drug laws. However, the state law applies only to foods and drugs sold in the state. Interstate shipments of foods and drugs that are adulterated or misbranded may be withheld from sale in the state, but the producer or manufacturer, if outside the state, may only be held accountable under the Federal law. This division is greatly indebted to the Food, Drug and Insecticide Administration of the U. S. Department of Agriculture for the cooperation and assistance in informing us of shipments of suspected illegal products.

Samples of interstate shipments are frequently collected at the request of the Federal administration. At present the Federal administration is assisting us in the control of apple and pear shipments which have an excessive amount of arsenic spray residue.

### **HOTEL INSPECTION**

An annual inspection of hotels is required by state law. Licenses are not required for hotels and no appropriation is made for their regulation. Inspections are made by the local health officers. Score cards for hotels are issued by this department for use by the health officers in their inspections. Copies of state laws and Board of Health regulations regarding hotel sanitation are also furnished for distribution. Particular stress is laid on cleanliness of bedding, length of sheets, ventilation and fire escapes.

### **CLERICAL WORK**

Form letters are sent to each licensed establishment, keeping them informed of new regulations and standards and of changes in old regulations. A placard is mailed out with each license. The placards bear the regulations with regard to the kind of business for which the license is issued. Health officers are informed of any changes in regulations and their attention is also called to specific violations for which they should be on the watch.

Approximately 20,000 form letters, 8,000 placards and 1,600 letters have been sent out during the past biennium.





