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## THE PRODUCTION OF SPECIFIC IMMUNITY IN WHITE MICE BY INTRANASAL INOCULATION WITH ENCEPHALITIS VIRUS (ST. LOUIS TYPE)<sup>1</sup>

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Students of the 1933 outbreak of encephalitis at St. Louis, notably Leake and Bredeck, were impressed with the marked similarity of this disease to poliomyelitis in many of its epidemiological characteristics. In poliomyelitis, the existence of a specific immunity in persons giving no history of a recognizable attack is an established fact, and the evidence relative to encephalitis (St. Louis type) is at present sufficient to permit the postulation of the same condition for this disease. For instance, Barr, on the basis of serum protection tests carried out by Muckenfuss and his coworkers at Washington University, St. Louis, reports that the sera of nurses and physicians who had been in close contact with cases of encephalitis show the presence of specific antibodies. Likewise, unpublished work carried out at the National Institute of Health by Dr. J. G. Wooley and his coworkers, shows that the sera of normal individuals giving no history of special exposure or of recognizable symptoms of the disease not infrequently possess specific neutralizing antibodies for encephalitis virus.

It is desired here to report the production of immunity in white mice by the introduction of live virus into the nares. During studies in which the intranasal route of inoculation was employed, it was observed that a number of such inoculated mice usually survived. The dose employed was 0.03 cc of a 1:700 suspension of mouse brain virus (Freeman strain). The mice were lightly etherized, and the inoculum was allowed to flow into the nostrils with inspiration. The mice were observed frequently; and the survivors, certainly in the great majority of instances, went through the tests without showing recognizable symptoms of illness. (Owing to the unreliability of the temperature curve as a criterion of illness in small animals, the thermometer was not employed.)

Nineteen days subsequent to the intranasal inoculation all the survivors were tested for immunity by the intracerebral inoculation of a dose of the same strain of virus sufficient to cause the death of

<sup>1</sup> From the National Institute of Health, United States Public Health Service.



State and local relief work was made in the act creating the Reconstruction Finance Corporation, one of the first of the emergency organizations set up by the Federal Government to further national recovery. In the spring of 1933 the Congress made additional provision for the relief of distress on a Nation-wide scale by creating the Federal Emergency Relief Administration and setting aside from the funds appropriated for the Reconstruction Finance Corporation the sum of \$500,000,000 to finance participation of the Federal Government in relief activities within the States.

The desirability of affording relief beneficiaries an opportunity to work for the aid given to them, as against the practice of making direct grants of money or supplies, was recognized with the beginning of the relief program, and this method of administering relief to certain classes of beneficiaries had come into general use throughout the country by the summer of 1933.

In a further effort to relieve unemployment and stimulate the recovery of private industry, the Congress, in 1933, created the Public Works Administration and appropriated a special fund to be used for the construction of additional public buildings for the Federal Government and for loans to States and municipalities for local construction projects. The necessary delays incident to the examination of proposed construction projects, the making of arrangements for the raising of local funds, the conducting of preliminary surveys, and the securing of bids and letting contracts had prevented the beginning of actual construction sufficient to provide employment on a large scale as early as had been hoped for. With the end of the agricultural season the unemployment situation had become more acute, and some other means of supplying work quickly had to be considered. Accordingly, the President decided to set aside from the Public Works appropriation the sum of \$400,000,000 to be allotted direct to the States for immediate expenditure on local work projects which could be easily and quickly undertaken and which were not considered suitable as public works projects. To administer this program there was set up, as an adjunct to the Federal Emergency Relief Administration, an organization designated as the Civil Works Administration.

In planning the work program to be undertaken in the several States, the Civil Works Administration considered it desirable that the projects undertaken be in the interest of the public welfare and community improvement as far as possible. Accordingly, the Public Health Service was asked, along with other Federal agencies, to suggest projects on which beneficiaries of the Civil Works Administration might be profitably employed. Four projects were recommended by the Public Health Service: namely, an intensive malaria control drainage program in the 14 States where malaria has prevailed most

extensively; the construction of sanitary privies in the small towns and villages and in the unsewered outskirts of larger cities; surveys to determine the extent of endemic typhus fever in rodents in important seaports and in certain inland areas where the disease now prevails; and the sealing of abandoned coal mines to reduce the acid wastes being discharged into streams used for water supplies.

In order that these projects might be given proper technical direction they were placed under the general supervision of the Public Health Service, and special allotments were made to the office of the Surgeon General for the employment of additional technical supervisory personnel, traveling expenses, purchase of tools, and the like.

The health officers of the States participating in the several programs were made the agents of the Public Health Service for technical supervision of the work. Special allotments of funds were reserved for the Public Health Service projects out of the funds given to the several States for the employment of labor and local supervisory personnel. The amounts set aside for labor totaled approximately \$4,500,000 for malaria control, \$5,000,000 for community sanitation, \$1,000,000 for typhus fever surveys, and \$1,500,000 for sealing abandoned coal mines. However, difficulties encountered in securing local allotments of labor and some unavoidable loss of time in organizing the work prevented the actual expenditure of the entire amounts allotted before the Civil Works program came to an end on February 15, 1934. It is estimated that not more than one-half of the funds tentatively allotted for labor on the malaria control and sanitation projects actually were expended and not more than one-third for sealing mines.

#### MALARIA CONTROL

In each of the States selected for malaria-control work, malaria is the major public health problem in much of their territory. In the malarious sections of these States the school-child infection rate (the rate for the only accurately measured group) varies from 10 percent to 60 percent, and in some places is as high as 95 percent. The effects of the infection are such that the school children not only do not make reasonable progress in their studies but are not able to put forth on an average more than two-thirds of the effort normally to be expected of them. This result of illness is reflected not only in the schools but on the farms and plantations and in the industries of the South. In the area affected there are approximately two million cases of malaria each year, and the annual loss is estimated at half a billion dollars. Although the death rate from malaria is not high in comparison with the rate for some other diseases, it does, in a number of States, exceed the death rate for typhoid fever and causes more deaths than smallpox.

The program was inaugurated in early December 1933 and was approaching its maximum of development by early January 1934. When the work commenced, the malaria projects were designated as Federal projects and an allotment of laborers was made for this purpose to each State. At the height of labor employment (January 20, 1934) there were 28,000 laborers at work daily on Federal projects. The work proved so popular and the benefits accruing from it were so apparent that the State directors of the Civil Works Administration supplemented the Federal projects by creating State and local projects of similar type. At the labor peak, reports showed the employment of 53,000 people on State and local projects, a total actually greater than the number on the Federal projects. The reported number at work on malaria drainage at the height of employment was over 80,000 laborers. As the number employed on State and local projects was only partially reported to the Public Health Service, it is known that the actual number was in excess of this figure; hearsay evidence places it at somewhere over 120,000 persons engaged in malaria control at the peak.

The results of the work can only be estimated. Drainage commenced after the last malaria transmission season had ended, and the new season has not yet arrived. We cannot at this time even approximate the number of persons living within possible flight range of those areas now drained which heretofore have produced *Anopheles* mosquitoes. However, in view of our knowledge of the general areas covered by the drainage program, it is conservatively estimated that not less than one-fifth of the population will be removed from the hazard of malaria if the drainage effected should be properly maintained in the future. It is believed that the economic benefit derived from the removal of this hazard will represent an annual saving of not less than \$100,000,000. The actual saving probably will be considerably greater than the estimates here given. A project is now under way for establishing the malaria index by, blood examination, in the areas where the work has been carried on. This will furnish a "base-line" for measurement of the results of the work in the future.

#### COMMUNITY SANITATION PROJECT

The community sanitation project was selected as a profitable means of employment of civil works labor because of the opportunity afforded to perform a service of value to the whole population of rural and semirural communities, and because the project was well adapted to the use of the type of labor predominating in such communities.

The work was carried on in 24 States, including all of the Southern States, and Delaware, Pennsylvania, Ohio, Indiana, Illinois, Kansas, and Washington. The health officers of all of the States were

informed of the possibility of using work-relief labor on privy construction and were given an opportunity to signify their willingness to participate in the project. The States selected were those which responded to the invitation.

The program in each State was set up under and administered through the State department of health. The supervisory personnel consisted of a State director, in general charge of the whole program in the field; district supervisors, selected from the reemployment rolls, each having responsibility for the work in a group of counties; and a county supervisor for each county, selected from the local reemployment rolls. It was the function of this force to promote local adoption of the program, sell the project to individuals, and train and supervise labor engaged in construction. Labor was assigned for the construction of sanitary privies only where materials were furnished by the property owner or by some public agency such as the county board of education, county supervisors, or the municipal government. Some municipalities purchased the materials in one lot for the sanitation of the entire community, the privies constructed being regarded as a public utility. Others purchased the materials and offered to furnish what was needed for the installation of a sanitary privy in any home in the community where the property owner would pay a certain proportion of the cost. Others purchased the material in order to take advantage of wholesale prices and expedite the work, and assessed the cost against the property on which the sanitary privies were erected, or provided other means for reimbursing the municipality. In some sections the labor was used to construct privies for farm homes throughout the county, but for the most part the work was confined to unsewered towns and villages, and the unsewered sections surrounding the sewered areas of the larger communities. The work was concentrated in these more congested areas because the health menace of an insanitary privy is proportionate to the number of persons who live within fly range of it, because typhoid fever is most prevalent in small towns and villages, and because more effective supervision could be exercised where the labor could be used in large groups.

Only a small number of men could be used at the very beginning, because materials for the project could not be furnished from Federal funds. However, the number employed increased steadily from the time the work was begun in December, reaching a total of 35,000 at the peak of activities. All materials had to be furnished by individual property owners or local public agencies. It was therefore necessary to make arrangements for materials and to develop sufficient interest in each community to create a demand for the work in advance of the assignment of labor. The local interest that developed in this program exceeded the most optimistic expectations of everybody

connected with it. It is estimated that at the peak of activities there were enough materials on hand and commitments made by property owners to furnish materials to make work for at least five times the number of laborers available.

#### ACCOMPLISHMENTS

1. Incomplete reports show more than 200,000 privies constructed. It is believed that the complete report will show at least 25,000 more constructed or partially completed by the end of March 1934.

2. While it will be impossible for some time to measure the result of the work in terms of actual prevention of disease, it is believed that there will be both immediate and remote benefits which will thoroughly justify the undertaking.

(a) As to immediate benefits, in communities where the program proceeded far enough to effect complete elimination of insanitary privies, it is expected that a noticeable reduction in the prevalence of excreta-borne diseases will occur.

(b) As to future benefits, even in communities where the program did not proceed far enough to accomplish a complete or almost complete elimination of insanitary privies, the community has been made "sanitation conscious" and there has been provided a standard of sanitation which will induce further progress on the part of both the public and the local governmental agencies. Modern standards of sanitation have been introduced into hundreds of communities and in several States which heretofore have given little attention to practical sanitary privy construction.

3. The supplying of materials by property owners and local governmental agencies has helped private industry. These purchases of materials by private individuals and agencies other than the Federal Government involved a total expenditure at least equal to the amount paid by the Civil Works Administration to labor employed on this project. It is estimated that the materials purchased included approximately—

100 million board feet of lumber;

40 thousand barrels of cement;

1 million pounds of nails; and

6 million square feet of roofing.

Most of the materials were purchased from local dealers.

#### TYPHUS FEVER CONTROL

Although formerly not an important cause of illness in this country, during the past 3 years endemic typhus fever has been increasing steadily and markedly in prevalence in certain areas of the United States. While in 1931 only 332 cases were reported in the entire country, the number rose to 995 in 1932, and to 2,043 in 1933. This

increasing prevalence had emphasized the necessity that measures be undertaken for reduction and limitation of the spread of the disease. The Federal Emergency Relief Administration desired to employ people on socially useful projects, and an attack upon this form of typhus through the medium of a restricted and properly directed campaign against disease-carrying rats and their parasites appeared to fulfill this requirement.

At the request of the Civil Works Administration, the Public Health Service indicated areas harboring the greatest amount of infection. The Biological Survey undertook a campaign of destruction of the rats in these areas by means of trapping and poisoning. At the same time it was planned that groups of men recruited from the ranks of the unemployed, and working under the supervision of the Public Health Service, would test the efficacy of these control measures and make tests on new areas to ascertain where additional control measures would be required in order to secure effective results. Unfortunately, the time of actual operation of the project was so short that very little progress could be made in that part of the control program which was to be carried out by the Public Health Service.

However, the Service was able to make considerable progress with another part of the program consisting in a rodent ecto-parasite survey having for its objective the determination of the vulnerability of our principal seaports and a few inland cities with respect to endemic typhus fever and bubonic plague.

Originally, a program was laid out to cover 7½ months' operations. Later, with the inauguration of the Civil Works Administration, this plan was revised for a 2½ months' period. Actually, however, less than a month of scheduled operations resulted, because of the delays in the initiation of the project and its sudden unforeseen curtailment in January. At the height of the work a total of 3,757 men were employed. The control work was carried on in three southern States, and the rodent ecto-parasite surveys were made in 30 seaports. The surveys are being continued in several of the cities as work-relief projects.

In spite of the very short time of unrestricted operations (1 month from the time of approval of the project), it is felt that some worthwhile results were accomplished. In several communities where rapidly increasing prevalence of typhus fever had created widespread apprehension on the part of the citizens, it was possible to locate the exact sources of infection and promptly institute intensive control measures. In other parts of the infected areas, where the early termination of the projects precluded complete achievement of the desired objectives, the partially completed work has at least been of substantial educational value, and the people have been awakened to the need of continued effort on their own part if a permanent reduction in the incidence of this disease is to be effected.



## SEALING ABANDONED COAL MINES

The sealing of abandoned coal mines was undertaken to provide work for unemployed miners and for the purpose of protecting the public health through the safeguarding of water supplies from the effects of acid mine-drainage. The action of oxygen, pyrites, and water in abandoned or idle bituminous coal mines brings about the formation of acid salts and sulphuric acid. In many sections the amount of acid thus formed and discharged into streams is sufficient to bring about an acid condition in these streams and in the larger rivers into which they discharge. This condition, which has been increasing in intensity in recent years, is materially affecting the efficiency of treatment of many public water supplies and has made the use of the water for some of the smaller supplies impossible.

This problem has been one of considerable concern to the health authorities in several of the soft-coal mining States for many years. In spite of the extent to which abandoned mines have contributed this acid water, little had been done in interesting mine operatives in an attempt to care for sections of mines properly as they became worked out.

Experimental work by the United States Bureau of Mines and the State Health Department of Pennsylvania had demonstrated that if air could be eliminated from abandoned workings, oxidation would cease and the water in, and flowing from, these openings would remain alkaline.

Two methods were possible by which this could be brought about:

- (1) Flooding of the workings, and
- (2) Air-sealing.

In either method the flow of water would not be interrupted. Certain dangers existed in the flooding method which made it practicable only under certain conditions. Air sealing in general appeared more satisfactory, although requiring more careful attention to insure that all openings, however small, were closed.

Funds were made available by the Civil Works Administration for the actual starting of operations on December 17, 1933, for carrying on the project in 10 States.

In Pennsylvania, West Virginia, and Alabama, where certain information was already available, permitting work in certain sections to start immediately, a considerable amount of actual sealing was effected. In other States, surveys were completed and work had just been started on the sealing when the restrictions on the employment of labor became effective, January 19, thus preventing any extensive construction.

While it was not possible to complete the project as planned, sufficient work was done to accomplish the following results:

Furnishing of records to State departments of health covering the location of mines discharging acid water and the extent of this discharge; demonstrating the practicability of air-sealing for control of acid mine-water; development of methods for air-sealing under varying conditions; the training of a considerable group of coal-mining engineers and others in the methods of acid mine-water control; and creating the interest of mine operators in the work.

The maximum number of persons were employed in this work during the week ending February 15, when 2,927 men and 24 women were on the pay roll. Of this number, approximately 2,700 were employed in Alabama, Pennsylvania, and West Virginia.

At the termination of the work on February 15, approximately 7,000 openings of various types had been closed, and several hundred additional openings were being closed.

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### COURT DECISIONS ON PUBLIC HEALTH

*Bovine tuberculosis statute held valid.*—(Illinois Supreme Court; *People v. Anderson*, 189 N.E. 338; decided Feb. 23, 1934.) The defendant, who had refused to permit his cattle to be tested for tuberculosis by officials of the Illinois Department of Agriculture, was charged with violating section 2 of the State bovine tuberculosis eradication law. The said section, so far as material to the issues of the instant case, reads as follows:

All owners of dairy or breeding cattle within the State of Illinois shall submit their cattle for a tuberculin test upon request of the department of agriculture and shall provide necessary facilities for making tests and render such assistance as may be required by the department. The direct expense of making such tests shall be paid by the department [etc.].

A jury found the defendant guilty and a fine was imposed. From this judgment the defendant appealed to the supreme court, contending, among other things, that section 2 of the act in question was violative of the State constitution and of the fourteenth amendment to the Federal Constitution.

The defendant's first contention of this character was that he was entitled to notice before any attempt was made by the department to test his cows and that the provisions of the act violated the due process of law provision of the Constitution. With regard to this the court said:

\* \* \* The destruction or sequestration of animals or food injurious to public health is a matter that requires urgent and prompt action. Delay only increases the opportunity for further harm to the public. The nuisance created by the keeping of cattle suffering from tuberculosis is a continuing one and a constant source of danger. Summary action is necessarily required to meet the exigencies of the situation. Public measures dealing with the protection of the lives and health of the people warrant the immediate seizure and destruction of

property dangerous to the lives and health of those consuming it. Tubercular cattle fall within this category. [Cases cited.] The due process rule is not a limitation upon the right of the State to exercise its power unless the attempted exercise is arbitrary or unreasonable or an improper use of such power. [Cases cited.] Due process of law does not necessarily mean judicial proceedings in some court of competent jurisdiction. [Cases cited.] Summary seizure and destruction without a hearing do not violate the due process clause of the Federal Constitution. [Cases cited.]

The second contention was that the law was unconstitutional in delegating to the department the power to make the tuberculin tests or to have them made, but the court disposed of this point adversely to the defendant, saying:

\* \* \* The legislature had the power to pass a law upon the subject of the suppression of tuberculosis in dairy and breeding cattle. As a necessary adjunct to such power it had the right to adopt a procedure for the administration of such law. It had the lawful right to invest the department with certain discretion to be exercised by it, acting through its agents, in the discharge of its functions as a ministerial and administrative agency. The powers granted were neither judicial nor legislative. [Cases cited.] There was no constitutional violation by the powers granted to the department by the act.

The final objection raised against the validity of the law was that the act's provision that the livestock owner "shall provide necessary facilities for making tests and render such assistance as may be required by the department" was too broad in conferring powers upon the department and was unconstitutional, indefinite, and uncertain. The court saw no merit in this objection and, in deciding against it, used the following language:

\* \* \* If such clause were invalid, it would not render the whole act unconstitutional. The crux of the act providing for the owner of dairy and breeding cattle to submit them to the tuberculin test would still remain in force. The provision for assistance and facilities at the request of the department is only incidental to the purpose of the act. It is not shown by the record that the department has promulgated any unreasonable or arbitrary rules under this power. The defendant was not injured by the provisions of the act providing for assistance and facilities. He did not base his refusal to have his cows tested upon the arbitrariness or unreasonableness of any requirement of the department for the administration of the act or any demand that he furnish assistance or facilities in making the test, but refused, under any circumstances, to have his cattle tested. Until he was hindered, affected, or prejudiced by the attempt of the department to enforce this provision of the act, he is in no position to complain. \* \* \*

After citing several cases upholding acts containing provisions requiring things to be done in and about their enforcement, the court went on to say:

\* \* \* Under the authority of these cases the provision for assistance on the part of the owner and the furnishing by him of facilities is not unconstitutional; neither does the act vest unreasonable and unrestricted power in the department, nor is the act indefinite and uncertain.

In bringing to a close its consideration of the defendant's contentions challenging the constitutionality and validity of the statute, the court

declared that "The act does not violate any of the State or Federal constitutional provisions urged against it and is a valid act."

*Additional decisions.*—Two other cases involving the bovine tuberculosis law were also decided by the Illinois Supreme Court on February 23, 1934. These were *People ex rel. Kerner, Atty. Gen., et al. v. Huls*, 189 N.E. 346 and *Witte et al. v. McLaughlin, Director of Department of Agriculture*, 189 N.E. 350. In the first-mentioned case the court (1) adhered to the conclusions reached in the Anderson case as to the constitutionality of the law; (2) held that the use of the verb "submit", in that part of section 2 which provided that the owners "shall submit their cattle for a tuberculin test upon request of the department of agriculture", did not render the law indefinite and uncertain, as "submit", taken in connection with the context, had a well-defined meaning, namely, "to present for determination"; and (3) held that an injunction proceeding could be brought to restrain the defendant from refusing to submit his cattle to the tuberculin test and from interfering in any manner with the State department of agriculture and its agents in making the test.

In the second-named case, which was a suit to restrain the State department of agriculture and its agents from enforcing or attempting to enforce the law, the court again said that the statute was not violative of the provisions of the State or Federal constitutions in respect to any of the charges made against it nor was it an oppressive and unwarranted use of the police power of the State.

## DEATHS DURING WEEK ENDED JULY 28, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 28, 1934	Correspond- ing week, 1933
<b>Data from 86 large cities of the United States:</b>		
Total deaths.....	8,851	7,206
Deaths per 1,000 population, annual basis.....	12.3	10.0
Deaths under 1 year of age.....	590	489
Deaths under 1 year of age per 1,000 estimated live births.....	55	41
Deaths per 1,000 population, annual basis, first 30 weeks of year.....	11.9	11.3
<b>Data from industrial insurance companies:</b>		
Policies in force.....	67,640,101	67,700,024
Number of death claims.....	12,396	12,065
Death claims per 1,000 policies in force, annual rate.....	9.6	9.3
Death claims per 1,000 policies, first 30 weeks of year, annual rate.....	10.4	10.2

<sup>1</sup> Data for 81 cities.

# PREVALENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Aug. 4, 1934, and Aug. 5, 1933

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 4, 1934, and Aug. 5, 1933*

Division and State	Diphtheria		-Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933
<b>New England States:</b>								
Maine.....		2			3	1	0	0
New Hampshire.....					21	8	0	0
Vermont.....	1				7	8	0	0
Massachusetts.....	3	16			46	83	0	1
Rhode Island.....		2			10		1	1
Connecticut.....	2	3		4	32	25	0	0
<b>Middle Atlantic States:</b>								
New York.....	24	31	12	11	174	186	2	3
New Jersey.....	5	7	2		59	34	0	2
Pennsylvania.....	33	42			535	195	5	4
<b>East North Central States:</b>								
Ohio.....	13	15	1	3	46	28	1	1
Indiana.....	12	5	14	20	23	13	0	2
Illinois.....	20	17	2	6	138	34	9	4
Michigan.....	2	20			47	33	1	2
Wisconsin.....	2	5	11	21	175	42	0	0
<b>West North Central States:</b>								
Minnesota.....	3	4		1	27	9	0	1
Iowa <sup>1</sup> .....	2	7			10	1	0	1
Missouri.....	10	4	3	1	14	13	1	0
North Dakota.....	12	2		5	19	27	1	1
South Dakota.....		3			13		0	0
Nebraska.....	13	2			9		0	0
Kansas.....	4	3			15	3	0	0
<b>South Atlantic States:</b>								
Delaware.....							0	0
Maryland <sup>2 3 4</sup> .....	3	1	48	2	29	10	0	0
District of Columbia.....	5	8			3	2	0	1
Virginia <sup>3</sup> .....	5	13			56	26	1	0
West Virginia.....	5	10	53	10	31	33	1	2
North Carolina <sup>3</sup> .....	14	18	1	1	47	43	1	0
South Carolina <sup>4</sup> .....	4	4	70	62	15	32	0	0
Georgia <sup>4</sup> .....	8	28				24	1	0
Florida <sup>4</sup> .....	7	9			25	11	0	0
<b>East South Central States:</b>								
Kentucky.....	23	6			50	5	3	0
Tennessee.....	7	15	13	6	21	30	2	0
Alabama <sup>1</sup> .....	19	21	3	7	59	14	0	0
Mississippi <sup>2</sup> .....	6	17					1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 4, 1934, and Aug. 5, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933
<b>West South Central States:</b>								
Arkansas.....	2	8	1	—	—	19	0	0
Louisiana.....	6	5	2	6	10	6	0	1
Oklahoma <sup>1</sup> .....	3	11	—	5	—	4	0	0
Texas.....	47	55	22	99	50	145	1	2
<b>Mountain States:</b>								
Montana.....	—	1	4	—	10	2	0	0
Idaho.....	—	—	—	4	—	4	0	0
Wyoming.....	—	1	—	—	—	5	0	0
Colorado.....	4	2	—	—	48	4	2	0
New Mexico.....	3	3	1	—	10	14	1	0
Arizona.....	—	4	1	—	1	—	0	1
Utah <sup>2</sup> .....	—	—	—	1	4	24	0	0
<b>Pacific States:</b>								
Washington.....	1	—	—	—	18	19	0	1
Oregon.....	—	—	7	6	7	27	0	0
California.....	24	25	17	9	86	106	2	0
<b>Total.....</b>	<b>357</b>	<b>455</b>	<b>278</b>	<b>280</b>	<b>2,004</b>	<b>1,355</b>	<b>37</b>	<b>31</b>

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933
<b>New England States:</b>								
Maine.....	1	1	7	4	0	0	3	0
New Hampshire.....	0	0	6	6	0	0	0	0
Vermont.....	2	0	6	1	0	0	0	0
Massachusetts.....	5	20	51	58	0	0	3	10
Rhode Island.....	0	1	1	12	0	0	0	0
Connecticut.....	1	0	4	13	0	0	3	3
<b>Middle Atlantic States:</b>								
New York.....	6	73	97	100	0	0	10	40
New Jersey.....	1	4	23	30	0	0	7	12
Pennsylvania.....	7	4	128	106	0	0	29	35
<b>East North Central States:</b>								
Ohio.....	3	4	59	110	0	3	54	58
Indiana.....	2	1	16	11	0	1	18	24
Illinois.....	10	7	70	74	0	2	51	28
Michigan.....	8	3	60	59	0	2	6	16
Wisconsin.....	2	0	44	17	3	2	9	3
<b>West North Central States:</b>								
Minnesota.....	6	4	14	10	0	0	2	2
Iowa <sup>1</sup> .....	0	1	8	8	0	2	26	8
Missouri.....	0	4	9	16	2	0	50	32
North Dakota.....	0	1	4	1	0	0	2	0
South Dakota.....	1	1	2	2	1	0	2	2
Nebraska.....	0	0	9	3	2	0	4	0
Kansas.....	2	5	17	17	0	0	22	15
<b>South Atlantic States:</b>								
Delaware.....	0	0	—	—	0	0	1	3
Maryland <sup>2 3 4</sup> .....	2	3	12	14	0	0	13	34
District of Columbia.....	1	0	3	7	0	0	2	2
Virginia <sup>1</sup> .....	3	0	18	13	0	0	36	38
West Virginia.....	1	3	21	28	0	0	32	53
North Carolina <sup>1</sup> .....	3	0	16	24	0	0	44	24
South Carolina <sup>4</sup> .....	0	1	4	4	0	0	38	36
Georgia <sup>4</sup> .....	1	0	1	10	0	5	44	45
Florida <sup>4</sup> .....	0	0	2	1	0	0	5	2
<b>East South Central States:</b>								
Kentucky.....	4	0	23	12	0	1	80	83
Tennessee.....	3	14	16	18	0	0	71	95
Alabama <sup>4</sup> .....	5	0	10	10	0	0	65	36
Mississippi <sup>2</sup> .....	0	0	11	9	0	0	20	23

Footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Aug. 4, 1934, and Aug. 5, 1933—Continued*

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933	Week ended Aug. 4, 1934	Week ended Aug. 5, 1933
<b>West South Central States:</b>								
Arkansas.....	0	0	1	1	0	0	21	25
Louisiana.....	2	2	9	7	0	0	19	53
Oklahoma <sup>1</sup> .....	0	0	6	7	1	0	57	22
Texas <sup>2</sup> .....	6	3	38	25	9	3	95	55
<b>Mountain States:</b>								
Montana.....	10	0	3	2	0	0	4	4
Idaho.....	17	0	1	4	0	1	1	2
Wyoming.....	0	2	3	1	0	0	0	5
Colorado.....	1	0	20	2	0	6	1	4
New Mexico.....	1	0	3	3	0	3	11	5
Arizona.....	5	0	-----	3	0	1	2	3
Utah <sup>3</sup> .....	1	0	2	3	0	0	1	2
<b>Pacific States:</b>								
Washington.....	41	1	9	7	4	5	5	4
Oregon.....	1	1	18	10	0	4	0	3
California.....	85	5	66	54	0	16	3	5
<b>Total.....</b>	<b>250</b>	<b>169</b>	<b>947</b>	<b>937</b>	<b>22</b>	<b>57</b>	<b>981</b>	<b>954</b>

<sup>1</sup> New York City only.

<sup>2</sup> Week ended earlier than Saturday.

<sup>3</sup> Rocky Mountain spotted fever, week ended Aug. 4, 1934, 11 cases, as follows: Maryland, 3; Virginia, 5; North Carolina, 3.

<sup>4</sup> Typhus fever, week ended Aug. 4, 1934, 62 cases, as follows: Maryland, 1; South Carolina, 1; Georgia, 9; Florida, 3; Alabama, 11; Texas, 37.

<sup>5</sup> Exclusive of Oklahoma City and Tulsa.

### SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Menin- gococ- cus menin- gitis	Diph- theria	Influ- enza	Malaria	Measles	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
<i>May 1934</i>										
Wisconsin.....	2	11	116	-----	9, 637	-----	1	996	85	8
<i>June 1934</i>										
Puerto Rico.....	-----	49	57	1, 570	62	-----	0	-----	0	40
<i>July 1934</i>										
Arkansas.....	1	6	1	443	3	25	0	1	1	70
Connecticut.....	1	4	5	2	271	-----	3	46	0	4
Delaware.....	2	1	-----	-----	23	-----	0	4	0	7
District of Columbia.....	2	16	2	-----	31	1	2	17	0	6
Massachusetts.....	6	43	-----	2	775	1	20	270	0	17
Nebraska.....	1	12	-----	-----	38	-----	2	16	12	8





## WEEKLY REPORTS FROM CITIES

City reports for week ended July 28, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross-section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine: Portland	0		0	1	0	7	0	1	0	5	19
New Hampshire:											
Concord	0		0	0	0	1	0	0	0	0	5
Manchester	0		0	0	0	0	0	0	0	0	10
Nashua	0			1		0			0	0	
Vermont:											
Barre	0		0	1	0	0	0	0	0	0	1
Burlington	0		0	0	0	0	0	0	0	0	10
Massachusetts:											
Boston	2		0	19	8	7	0	12	1	64	180
Fall River	1		0	1	2	0	0	0	1	3	15
Springfield	9		0	0	2	1	0	1	0	3	24
Worcester	0		1	0	3	7	0	1	0	13	55
Rhode Island:											
Pawtucket	1		0	0	0	0	0	0	0	0	
Providence	0	1	0	0	0	0	0	2	0	50	38
Connecticut:											
Bridgeport	0	1	0	0	0	1	0	2	0	10	21
New Haven	0		0	0	1	0	0	0	2	9	30
New York:											
Buffalo	3		0	5	11	9	0	8	0	41	120
New York	19	1	1	50	64	36	0	71	10	205	1,245
Rochester	0	1	0	1	2	4	0	0	0	5	38
Syracuse	0		0	16	0	1	0	0	0	34	42
New Jersey:											
Camden	0		0	0	1	1	0	0	0	14	11
Newark	0		0	4	3	4	0	9	0	43	92
Trenton	0		0	0	2	1	0	5	1	0	37
Pennsylvania:											
Philadelphia	3		0	7	9	24	0	18	3	176	403
Pittsburgh	5	1	0	45	8	15	0	10	0	27	163
Reading	0		0	0	0	0	0	2	0	15	27
Scranton	0			4		0			0	17	
Ohio:											
Cincinnati	2		0	0	4	6	0	3	0	8	287
Cleveland	5	10	1	61	6	10	0	11	1	80	185
Columbus	1	2	2	0	3	9	0	10	4	8	141
Toledo	3		0	14	1	5	0	2	0	38	54
Indiana:											
Fort Wayne	0		0	0	1	0	0	2	1	1	35
Indianapolis	4		0	3	10	1	0	3	1	4	174
South Bend	0		0	2	0	0	0	1	2	0	29
Terre Haute	0		0	0	2	0	0	0	0	0	34
Illinois:											
Chicago	7	2	2	104	41	38	0	39	2	86	1,063
Springfield	0		0	2	3	1	0	0	0	7	32
Michigan:											
Detroit	4		1	7	3	12	0	19	2	75	229
Flint	0		0	1	4	2	0	0	0	10	32
Grand Rapids	0		0	1	0	2	0	0	0	9	35
Wisconsin:											
Kenosha	0		0	4	0	0	0	0	0	5	5
Milwaukee	3	1	1	96	3	16	0	3	1	75	100
Racine	0		0	0	0	3	0	0	2	19	15
Superior	0		0	0	0	0	0	0	0	0	7
Minnesota:											
Duluth	0		0	3	0	1	0	0	1	1	14
Minneapolis	0		0	6	4	8	0	0	0	1	110
St. Paul	0		0	0	7	1	0	1	0	28	77
Iowa:											
Davenport	0			0		0			0	0	
Des Moines	0			0		6			0	0	54
Waterloo	1			1		0			4	9	
Missouri:											
Kansas City	0		0	0	7	3	0	3	0	2	213
St. Joseph	2		0	1	8	0	0	0	0	0	
St. Louis	4		0	0	5	2	0	11	3	39	546

Footnotes at end of table.

City reports for week ended July 28, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Dakota:											
Fargo	0		0	2	0	0	0	0	0	39	10
Grand Forks	0			1		0	0		0	0	
South Dakota:											
Aberdeen	0			0		0	0		0	6	
Nebraska:											
Omaha	1		0	0	11	0	0	3	0	2	123
Kansas:											
Topeka	0		0	2	5	0	0	0	0	15	55
Wichita	0	1	0	1	1	1	0	1	1	8	24
Delaware:											
Wilmington	0		0	0	1	0	0	2	0	2	31
Maryland:											
Baltimore	1	1	1	10	17	5	0	8	4	111	207
Cumberland	0		0	2	0	0	0	0	0	0	15
Frederick	0		0	0	0	0	0	0	0	0	1
Dist. of Columbia:											
Washington	2		0	5	8	2	0	16	3	33	141
Virginia:											
Lynchburg	0		0	10	0	0	0	0	0	21	15
Richmond	0		0	4	1	1	0	0	0	9	45
Roanoke	0		0	0	0	0	0	0	0	8	13
West Virginia:											
Charleston	1		0	2	1	0	0	0	2	11	12
Huntington	0		0	0		1	0	0	0	1	
Wheeling	0		0	0	2	3	0	0	0	2	22
North Carolina:											
Wilmington	0		0	0	2	0	0	0	0	8	12
Winston-Salem	0	1	0	2	0	1	0	0	1	8	17
South Carolina:											
Charleston	1	3	0	0	1	0	0	4	1	0	19
Columbia	0		0	0	1	0	0	1	0	0	19
Greenville	0					0	0		0	2	
Georgia:											
Atlanta	0	4	0	3	5	0	0	6	3	12	80
Brunswick	0		0	0	0	0	0	0	0	0	4
Savannah	0	5	0	0	0	0	0	2	0	5	31
Florida:											
Miami	2	2	0	2	0	0	0	0	1	3	25
Tampa	0		0	1	0	0	0	1	1	2	28
Kentucky:											
Ashland	0			0		0	0		2	0	
Lexington	0		0	0	1	2	0	1	0	0	20
Louisville	3		0	20	8	2	0	2	1	13	81
Tennessee:											
Memphis	1		0	0	8	1	0	7	4	8	111
Nashville	2		1	0	2	1	0	2	1	0	60
Alabama:											
Birmingham	0	1	0	1	3	1	0	4	9	2	66
Mobile	0		0	1	1	0	0	0	0	0	23
Montgomery	1			2		2	0		1	0	
Arkansas:											
Fort Smith											
Little Rock	1		0	0	5	0	0	3	1	0	9
Louisiana:											
New Orleans	7	1	1	2	6	1	0	14	9	1	135
Shreveport	0		0	0	3	0	0	0	1	1	21
Oklahoma:											
Oklahoma City	2	4	0	0	2	1	0	3	0	0	57
Tulsa	0			0		2	0		0	9	
Texas:											
Dallas	11		0		1	3	0	0	2	10	66
Fort Worth	1		0	0	0	0	0	0	1	0	34
Galveston	0		0	0	2	0	0	1	0	0	13
Houston	3		0	0	5	0	0	5	0	0	68
San Antonio	0		0	0	1	0	0	8	1	0	52
Montana:											
Billings	0		0	1	0	0	0	0	0	1	6
Great Falls	0		0	1	0	0	0	1	0	0	5
Helena	0		0	0	0	0	0	0	0	0	3
Missoula	0		0	0	1	0	0	0	0	0	4
Idaho:											
Boise	0		0	2	0	1	0	0	0	1	3

Footnotes at end of table.

## City reports for week ended July 28, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Colorado:											
Denver.....	3	19	1	36	1	13	0	2	0	15	70
Pueblo.....	0		0	2	0	4	0	1	1	0	10
New Mexico:											
Albuquerque....	0	1	0	3	0	0	0	4	2	4	12
Utah:											
Salt Lake City..	0		0	2	1	9	0	0	2	47	33
Nevada:											
Reno.....	0		0	0	0	0	0	0	0	0	5
Washington:											
Seattle.....	0		1	7	3	5	5	2	0	34	72
Spokane.....	0			1		1	0	0	0	13	28
Tacoma.....	0		0	2	1	1	0	0	0	3	28
Oregon:											
Portland.....	0		0	2	1	5	0	2	0	0	68
Salem.....	0			1		0	0		0	4	
California:											
Los Angeles....	12	6	1	6	6	7	0	22	1	29	249
Sacramento....	1		0	4	2	2	0	1	0	8	19
San Francisco..	3	2	2	15	5	7	0	12	0	9	137

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				North Dakota:			
Boston.....	1	1	1	Fargo.....	1	1	0
Springfield....	0	0	1	District of Columbia:			
Worcester.....	0	0	1	Washington....	3	0	0
New York:				Kentucky:			
Buffalo.....	0	0	1	Louisville....	0	1	0
New York.....	1	0	4	Alabama:			
Pennsylvania:				Birmingham....	0	0	1
Pittsburgh....	0	1		Montana:			
Ohio:				Missoula.....	0	0	1
Cincinnati....	1	1	1	Washington:			
Cleveland.....	2	0	1	Spokane.....	0	0	13
Illinois:				California:			
Chicago.....	0	1	5	Los Angeles....	0	0	51
Michigan:				Sacramento....	0	0	2
Detroit.....	1	0	3	San Francisco..	0	0	3
Wisconsin:							
Milwaukee....	2	1	0				

*Dengue*.—It is estimated that on Aug. 3, 1934, there were 2,500 cases of dengue in Miami, Fla.

*Lethargic encephalitis*.—Cases: New York, 2; Philadelphia, 1; Pittsburgh, 1; Cleveland, 1; St. Louis, 1; Birmingham, 1.

*Pellagra*.—Cases: Winston-Salem, 1; Charleston, S.C., 1; Atlanta, 1; Savannah, 5; Miami, 2; Memphis, 2; Birmingham, 1; Dallas, 4; Los Angeles, 1; San Francisco, 2.

*Typhus fever*.—Cases: New York, 1; Savannah, 2; Houston, 1; Los Angeles, 1.

## FOREIGN AND INSULAR

### CANADA

*Quebec Province—Communicable diseases—2 weeks ended July 28, 1934.*—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended July 28, 1934, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	1	Puerperal septicemia.....	2
Chicken pox.....	44	Scarlet fever.....	80
Diphtheria.....	40	Tuberculosis.....	149
Erysipelas.....	1	Typhoid fever.....	41
German measles.....	2	Undulant fever.....	2
Measles.....	293	Whooping cough.....	356
Poliomyelitis.....	2		

### CZECHOSLOVAKIA

*Communicable diseases—May 1934.*—During the month of May 1934 certain communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax.....	8	2	Paratyphoid fever.....	48	-----
Cerebrospinal meningitis.....	10	2	Poliomyelitis.....	9	1
Chicken pox.....	277	2	Puerperal fever.....	46	19
Diphtheria.....	1,958	118	Scarlet fever.....	1,004	26
Dysentery.....	34	2	Trachoma.....	119	-----
Influenza.....	23	10	Typhoid fever.....	369	20
Lethargic encephalitis.....	2	1	Typhus fever.....	72	3
Malaria.....	887	-----			

### DENMARK

*Vital statistics—1932.*—The following vital statistics have been published by the Danish Medical Bureau of the Department of the Interior for Denmark for 1932:

Population.....	3,590,000	Deaths from—Continued.	
Number of live births.....	64,650	Influenza.....	1,173
Number of stillbirths.....	1,532	Jaundice (epidemic).....	17
Number of deaths.....	39,701	Measles.....	92
Deaths per 1,000 population.....	11.06	Mumps.....	4
Deaths under 1 year of age.....	5,570	Paratyphoid fever.....	31
Deaths under 1 year per 1,000 live births.....	86	Poliomyelitis.....	15
Deaths from—		Puerperal fever.....	69
Bronchopneumonia.....	2,072	Scarlet fever.....	22
Cancer.....	5,239	Suicide.....	689
Cerebrospinal meningitis.....	53	Syphilis.....	84
Diabetes.....	643	Tuberculosis (respiratory).....	1,940
Diphtheria and croup.....	75	Typhoid fever.....	32
Erysipelas.....	110	Whooping cough.....	386

## YUGOSLAVIA

*Communicable diseases—June 1934.*—During the month of June 1934, certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax.....	46	3	Poliomyelitis.....	1	-----
Cerebrospinal meningitis.....	7	6	Scarlet fever.....	231	7
Diphtheria and croup.....	393	34	Sepsis.....	8	3
Dysentery.....	67	6	Tetanus.....	69	26
Erysipelas.....	168	11	Typhoid fever.....	211	19
Measles.....	878	3	Typhus fever.....	118	5
Paratyphoid fever.....	18	1			

## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for July 27, 1934, pp. 890-903. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Aug. 31, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

## Cholera

*China—Amoy.*—During the week ended July 7, 1934, 1 suspected case of cholera with 1 death was reported in Amoy, China.

## Plague

*United States—Oregon.*—A report of a case of plague in the interior of the State of Oregon appears on page 974 of this issue.

## Typhus Fever

*Chile—Santiago.*—A report dated July 17, 1934, states that there had been a recent increase in the prevalence of typhus fever in Santiago, Chile.

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