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OUTBREAK OF UNDULANT FEVER TRACED TO INFECTED MILK SUPPLY

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The borough of Pitman, N. J., is situated in Gloucester County, 18 miles southeast of Philadelphia, Pa. The population of the borough is 5,387 (1930); a rural population of about 2,000 visits the village for commercial purposes, but the proximity of the larger communities of Camden, N. J., and Philadelphia tend to make Pitman less used as a market center for the farming population surrounding it.

The water supply of the town is obtained from artesian wells and is distributed through two systems, one supplying the older portion of the town, the other supplying the newer portion. Practically every individual in town uses water from one or both of these systems. The older distributing system serves a much smaller group than the newer system. The sanitary quality of the water supplied through both systems has always been satisfactory.

Sewage is conveyed by water-carriage system to two disposal plants, which discharge their effluent into two small streams.

The daily milk consumption of the town in November, 1930, was about 2,056 quarts, of which 1,540 quarts (75 per cent) were pasteurized, 510 quarts (25 per cent) were raw, and 6 quarts were certified. Milk was supplied by eight dealers, of whom four were producers of all or part of the milk that they sold. In Pitman, four dealers sold only raw milk, one sold only pasteurized milk, and three sold both raw and pasteurized milk. One of the latter group also sold certified milk.

Table 1 shows the relative amount of milk sold in Pitman by each dealer.

TABLE 1.—Milk sold by different dealers in Pitman in November, 1930

Dealer	Per cent of the town's total milk	Per cent of the town's raw milk	Per cent of the town's pasteurized milk	Per cent of the town's certified milk
A	17.02	68.62	(1)	-----
B	40.42	4.90	51.95	100
C	29.23	0.20	38.99	-----
D	5.84	15.69	2.60	-----
E	0.39	1.57	-----	-----
F	1.46	5.88	-----	-----
G	0.77	3.14	-----	-----
H	4.87	-----	6.49	-----
Total	100.00	100.00	100.00	100.00

¹ Dealer A stated that about Dec. 15, 1930, when he found his herd rather heavily infected with *Brucella melitensis* var. *abortus* he had a portion of his milk pasteurized at another dealer's plant in order that he (dealer A) might furnish pasteurized milk to those desiring it. It was such pasteurized milk that case No. 6 used for a few days and then returned to raw milk.

The first case of undulant fever recognized in a resident of Pitman was diagnosed on November 25, 1930. During the following two months the disease was recognized in five others, though some of these had actually been taken sick prior to the onset of the disease in the case in which the disease was first recognized. The general statistical data of the cases are given in Table 2. The cases are numbered in the order of their diagnosis, rather than in order of their onset.

TABLE 2.—Data regarding cases

Case No.	Sex	Age	Occupation	Approximate date of prodromal symptoms	Date took to bed	Agglutination titer	Date of agglutination test
1	M	33	Physician	Nov. 3, 1930	Nov. 22, 1930	1,500	Nov. 25, 1930
2	M	32	Bank clerk	Oct. 24, 1930	Oct. 24, 1930	1,500	Dec. 2, 1930
3	F	42	Dressmaker	Nov. 23, 1930	Nov. 30, 1930	1,280	Dec. 16, 1930
4	F	58	Housewife	Oct. 24, 1930	Jan. 4, 1931	1,280	Jan. 22, 1931
5	M	17	High-school student	Sept. 1, 1930	Sept. 18, 1930	640	Jan. 24, 1931
6	F	44	Housewife	Unknown	Jan. 5, 1931	1,280	Jan. 27, 1931

¹ Serum of cases 1 and 2 were not tested in dilutions higher than 1 to 500.

The positive agglutination test in case 1 suggested the application of the test in case 2, who had symptoms similar to those observed in case 1. The agglutination test in both of the cases was done at a hospital laboratory in Philadelphia. Case 3 began about the time of the recognition of the disease in cases 1 and 2 and was definitely diagnosed through a positive agglutination test (at the laboratory of the State department of health) about three weeks after onset. Case 4 was the mother of case 2; both were taken sick on the same day, October 24, 1930. Case 4 was visiting in Pittsburgh, Pa., when taken sick. Although not acutely ill, she felt that it was best to return home if she was going to be sick. Upon arriving home she found her son (case 2) in bed, and without acquainting him with

her own illness, and suppressing as best she could evidence of the same, she attended and nursed her son through the greater part of his illness. When the son began to improve, the mother went to bed, and later her blood was found positive for *Brucella* agglutinins. The diagnosis of the fifth case was established after the apparent recovery of the patient. Case 5 was actually the first case to occur and was not recognized until the presence of the disease in the village was shown by the diagnosis of cases 1 to 4, inclusive. A blood specimen taken on January 23, 1931, was found positive for *Brucella* agglutinins in 1:640 dilution. Case 6 came to light in an accidental way. The patient fell down stairs on January 5, 1931, sustaining many contusions and a probable concussion of the brain. She went to bed at once. On January 9 a nurse was engaged to attend her and the nurse routinely made observations and records of the patient's temperature. A temperature varying from 100° to 103.5° F. was found in the afternoon, with morning temperatures at or near normal. There being no apparent explanation for the fever, and as there were other cases in the village, a blood specimen was forwarded to the laboratory, where positive agglutination was obtained in 1:1280 dilution.

EPIDEMIOLOGY

Sex.—The six cases were equally divided between the two sexes.

Age.—All six cases fall in age groups in which undulant fever is frequent, though in this small group the females were all older than the males.

Occupation.—Five occupations are represented in the 6 cases (housewife being the only occupation followed by more than one of the cases). All three of the women were married; two of the husbands were employed in a railroad office, the third was a bank official. One woman did not do routine housework and handled no meat at home; the other two handled meat in the kitchen incident to preparing meals.

Place of residence.—All cases had lived in Pitman for 7 to 20 years.

Temporary absences.—Case No. 1 frequently went to Philadelphia and also to a golf course near the New Jersey seashore.

Case No. 2 was in Pittsburgh for 3 days about October 12, 1930.

Case No. 3 was frequently in Philadelphia and vicinity on business connected with her vocation.

Case No. 4 was in Pittsburgh from October 22 to October 26, 1930.

Case No. 5 visited friends in Ocean City, N. J., for a few days in August, 1930.

Case No. 6 had not been absent except to go to Philadelphia occasionally to do shopping.

TABLE 3.—Dairy products and habits as to consumption of same

Case No.	Regular milk supply	Raw or pasteurized	Supplemen- tary milk supply	Raw or pasteurized	How used			Extent of use	Ice cream	Butter	Cheese
					Beverage	Cereals, etc.	Coffee				
1	A	R	B	P	Daily	Daily	Occasionally	1 quart for family of 2 (drank 2 to 3 glasses daily).	Frequently	Creamery	Very seldom.
2	A	R	None.	P	do	do	Daily	1 to 2 quarts for family of 4 (drank at least 1 glass daily).	do	do	Frequently.
3	A	R	B	P	Occasionally	do	do	1 pint milk 1/4 pint cream, for family of 3.	None	do	Do.
4	A	R	None.	P	Daily	do	do	1 to 2 quarts for family of 4 (drank 1 to 2 glasses daily).	Frequently	do	Do.
5	A	R	B	P	do	do	None	1 to 3 quarts for family of 5 (drank 3 to 5 glasses daily).	Very frequently	do	Do.
6	A	R, P	B	P	Frequently	do	Daily	Drank 1 glass about twice a week.	Seldom	do	Freely.

Milk supply.—Table No. 3 shows the milk supply and habits of the various individuals as regards consumption of dairy products. It will be noted that all obtained raw milk from dairy A for their regular home milk supply, although case 6 used pasteurized milk from the same dairy for a few days in December and then returned to raw milk. Some of the cases used pasteurized milk from other sources as a supplementary supply. Four drank milk regularly every day, one about twice a week, and one occasionally. Five of the six used milk or cream on cereals, desserts, etc., while four used cream in coffee daily, and one used it in coffee occasionally, as he was not a regular coffee drinker.

Ice cream.—Five of the six persons ate ice cream to some extent. Four of the five cases ate ice cream that came from large ice-cream plants in Philadelphia whose product is sold over a wide area having Philadelphia as its center. Pasteurized milk and cream were used by one local ice-cream manufacturer whose product was used by the remaining case.

Butter.—The butter used by all the cases was creamery print butter obtained from various stores. Since practically all creamery butter is made from pasteurized cream, and butter is used by a large proportion of the population of the community, there seems no valid reason for suspecting that an infection caused by butter should appear exclusively in users of milk from a single dairy.

Cheese.—All cases used American cheese to some extent. None of the group reported the eating of imported cheese.

Eggs.—All of the group ate eggs, preferably soft boiled. None ate raw eggs.

TABLE 4.—Habits as to eating of eggs, meats, etc.

Case No.	Eggs			Beef			Pork		Lamb		Chick- en
	Raw	Cooked soft	Cooked hard	Raw	Rare	Well cooked	Raw	Well cooked	Raw	Well cooked	Well cooked
1	None..	Yes...	No....	None.....	.....	Prefer..	None..	Bacon only.	None..	Yes...	Yes.
2	..do...	Yes...	No....	..do.....	.....	..do...	..do...	None.....	..do...	Yes...	Yes.
3	..do...	Yes...	No....	Occasionally.	Prefer..	..do...	..do...	Yes.....	..do...	Yes...	Yes.
4	..do...	Yes...	No....	None.....	.....	Prefer..	..do...	None.....	..do...	Yes...	Yes.
5	..do...	Yes...	No....	..do.....	.....	..do...	..do...	..do.....	..do...	Yes...	Yes.
6	..do...	Yes...	No....	..do.....	.....	..do...	..do...	Yes.....	..do...	Yes...	Yes.

Meats.—All six ate beef, three ate pork in some form, all ate lamb and chicken. One occasionally ate a little raw beef; the others ate no raw meat. Five preferred their meats well cooked; one preferred beef rare.

Water.—The borough has two public water supplies, both obtained from artesian wells. The cases occurred in the newer portion of the town, which is supplied by the newer water system. Had the water

been responsible for the spread of undulant fever it is reasonable to expect that the cases would be distributed throughout the town, occurring on the routes of the various milk dealers in numbers directly proportional to the number of persons served by each dealer. Instead of such distribution the cases all occurred among the customers of one dairyman, although he sold only 17 per cent of the milk supplied to the town.

Contact with live stock.—None of the cases gave a history of contact with animals other than dogs or cats. Cases 1, 3, and 5 had dogs and cats in the home, while case 6 had only a cat.

EVIDENCE OF INFECTION IN THE HERD SUPPLYING MILK

Dairy A was located on a farm a few miles outside the borough limits. This dairy sold about 450 quarts of milk daily, of which 350 quarts were sold in Pitman.

The herd owned by the dairy produced about 300 quarts, and about 150 quarts were purchased from another dairyman. About 200 quarts of the milk from the herd of dairy A were sold without mixing with the milk purchased from the other dairy. The remainder was mixed milk from both sources. Dairy A also sold about 5 quarts of raw cream daily in Pitman, all of which came from the home herd. The barns, milk house, and utensils of dairy A were kept in good sanitary condition.

Brucella infection was present in the herd of dairy A. About December 12, 1930, the agglutination test was applied to each animal of the herd, and of 42 animals tested 24 gave positive reactions in various titers. Fourteen gave positive reactions with the milk serum. From milk samples taken from six of the milking cows on February 5, 1931, *Br. melitensis* var. *abortus* was isolated from two samples by the staff of the Experiment Station of the United States Department of Agriculture at Bethesda, Md., and also at the laboratory of the New Jersey State Health Department. These cultures were isolated by incubation in an atmosphere of increased carbon dioxide tension and gave the reaction characteristic of *Br. abortus* (Bang) when grown on media containing thionin, methyl violet, and basic fuchsin according to the method described by Huddleson.

HISTORY OF THE HERD AFTER THE RECOGNITION OF UNDULANT FEVER IN PITMAN

When three cases of undulant fever had been recognized in Pitman and all were found to be using raw milk from dairy A, and, in addition, the presence of reacting animals in the herd was indicated as a result of laboratory tests, the State department of health issued an order

prohibiting the transportation and sale of all raw milk, cream, or other dairy products from the plant of dairy A until all reacting animals were permanently removed from the premises, unless such milk, cream, or dairy products, were first pasteurized. This order applied to all milk handled at this plant, both that produced at home and that purchased. As the disposal of such a large portion of the herd could not be made economically, the owner of dairy A installed a pasteurizing plant and, after a few days required to perfect the operation of the same, served only pasteurized milk to his customers. The operation of the plant was checked quite closely by health officials and found satisfactory. The owner of dairy A apparently left nothing undone that would make the process of pasteurization effective, as this was the only available means of carrying him over his business crisis. One month after he had begun the operation of his pasteurizing plant he reported that his milk sales were only about 20 quarts less than they had been when he sold raw milk.

Of the three cases of undulant fever in Pitman that have been *diagnosed* since dairy A discontinued the sale of raw milk, two date back to the early fall. In chronological order of onset of symptoms these two would be No. 1 and No. 3. The date of onset of the remaining case is unknown, as its recognition was incidental to treatment of accidental injuries. However, as the injury was received January 5, 1931, 5 days before the discontinuance of sale of raw milk by dairy A it seems more than likely that the infection was received prior to January 10, 1931.

EPIDEMIOLOGIC NOTES ON INDIVIDUAL CASES

Case 1.—Male 33, physician, had lived in Pitman nine and one-half years. Prodromal symptoms began between November 1 and November 3, 1930. Recalls that on Armistice Day, November 11, he was feeling very much indisposed. Took to bed November 22, 1930, when he went to a hospital in Philadelphia. One other person in the family. Patient had attended case No. 2 since October 25, 1930. Makes professional calls in surrounding rural district and frequently goes to Philadelphia and to a golf course outside the borough. Had drunk no milk nor had come in contact with livestock during such absences. Used town water. Regular home milk supply was raw milk from dairy A. Whipping cream was occasionally obtained from dairy B, this being pasteurized cream. Used cream in his coffee once a week at Rotary luncheon. Drank 2 to 3 glasses of milk daily at home. Frequently ate ice cream, used creamery butter, and seldom ate cheese. Ate eggs soft boiled, no raw eggs; no raw meat of any kind; ate no pork. Prefers meats well cooked. No contact with livestock other than a dog and cat in own home. Blood agglutination positive in 1:500 dilution, this being the highest dilution used in applying the test.

Case 2.—Male 32, bank clerk, had lived in Pitman 7 years. Three others in family, one of whom had undulant fever (case 4). Felt somewhat indisposed for a few days prior to October 24, 1930, on which date he became suddenly worse and went to bed. Was in Pittsburgh, Pa., three days during the second week in October; used no milk or cream there except on cereals or in coffee.

Used water from town's public supply. Regular home milk supply, raw milk from dairy A, taking 1 to 2 quarts for a family of four. Drank at least one glass of milk daily. Ate ice cream frequently at a downtown drug store. Creamery butter used, and occasionally ate some American cream cheese. Ate no raw eggs, and prefers eggs soft cooked. Ate no raw meats and no pork of any kind. Prefers meats well cooked. Had no contact with livestock. Blood agglutination test positive in 1:500 dilution. Not tested in higher dilution.

Case 3.—Female 42, dressmaker, wife of railroad clerk. Lived in Pitman between eight and nine years. Two others in family. Frequently absent from Pitman whenever and wherever her work called her, but particularly in suburbs of Philadelphia, usually returning home each night. Drank no milk while away from home and came in contact with no animals other than dogs and cats. Used water from town supply at home and from other sources while away at work. Regular home milk supply was raw milk from dairy A, taking one pint of milk and one-half pint of cream for a family of three. Only occasionally drank a glass of milk, but used cream daily on cereals and in coffee. Did not eat ice cream. Ate creamery butter and frequently ate cheese, American brands being used exclusively. Ate no raw eggs and prefers eggs soft cooked; occasionally ate a little raw beef. Prefers meats cooked rare. Patient handled no meat in the home, the housework and cooking being done by another. There was no contact with livestock. Blood agglutination test positive for undulant fever in 1:1280 dilution on December 16, 1930.

Case 4.—Female 58, wife of railroad official, and mother of patient of case 2. Had lived in Pitman 7 years; three others in family. Was in Pittsburgh, Pa., from October 22 to October 26, 1930, visiting relatives. On October 24 she had a chill and felt feverish afterwards. Fearing she was going to be ill for some time, she started for home. Upon arriving home she found her son (case 2) sick in bed, and without advising others of her illness she took care of her son. On January 4, 1931, she took to bed. Drank no milk while in Pittsburgh. Water supply at home was the public system. Regular home milk supply was raw milk from dairy A. At home she drank 1 to 2 glasses of milk daily and used cream on cereals and in coffee. Took 1 to 2 quarts of milk for family of four. Frequently ate ice cream purchased from local dealers who obtained their ice cream from large manufacturing plant in Philadelphia. Used creamery butter and was very fond of cheese, using chiefly American cream cheese. Ate no raw eggs and prefers eggs soft cooked. Ate no pork of any kind and no raw meats; prefers meats well cooked. Handled meat incidental to preparing meals in the home. Had no contact with livestock. Blood agglutination test positive for undulant fever in 1:1280 dilution January 19, 1930.

Case 5.—Male 17, high school student. Golf caddy in summer. Had lived in Pitman 10 years. Four others in family. Prodromal symptoms noted about September 1, 1930, and patient went to bed September 18, 1930. Had visited friends in Ocean City, N. J., for one week during August. Drank milk on this visit but does not know whether same was raw or pasteurized. Used town water supply. Regular home milk supply was raw milk from dairy A, 2 to 3 quarts for family of five. Drank 3 to 5 glasses daily and used it on cereals. Ate ice cream extensively in Pitman and while visiting in Ocean City. Used creamery butter and ate some Philadelphia cream cheese. Ate no raw eggs and no raw meats. Prefers eggs soft cooked and meats well cooked. No contact with animals other than dog and cats at home. Blood agglutination test positive for undulant fever in 1:640 dilution on January 23, 1931. The case was very mild, keeping him in bed only about two weeks, though he felt weak and tired for several weeks. Diagnosis was established after recovery of the case and after the presence of the disease in town was ascertained.

Case 6.—Female 44, wife of bank official. Had lived in Pitman 20 years. Two others in family. Had been to Philadelphia on various occasions to do shopping, etc. Drank no milk away from home. Water used came from the public town supply. Regular home milk supply raw milk from dairy A. Drank milk at times, averaging about 2 glasses per week. She took pasteurized milk for a few days in December, 1930, but then returned to using raw milk. Used cream in coffee daily. Seldom ate ice cream, used creamery butter, and ate freely of American cheeses. Ate no raw eggs or raw meat. Prefers eggs soft cooked and meats well cooked. No contact with animals except one cat at home. The onset in this case is unknown. On January 5 patient fell down stairs and probably suffered concussion of the brain, confining her to bed until January 23. On January 9 a nurse was engaged, who took temperatures routinely and found fever present, which continued until January 30. Blood agglutination test was positive for undulant fever in 1:1280 dilution on January 27, 1931.

COMMENT

Six cases of undulant fever occurring in a town of 5,387 population all used raw milk from the same dairy, which supplied 17 per cent of the milk sold in the town. Laboratory tests of the animals in the herd of this dairy revealed evidence of *Brucella* infection in a large number of the cows. In addition, *Brucella* was isolated from the milk of two of the reacting animals. While the number of cases is small, the evidence points quite conclusively to the milk supplied by this dairy as the agent transmitting the infection.

Another point of great interest to sanitarians is that no cases of undulant fever have occurred in the borough since this producer and dealer began pasteurization of all milk distributed by him, notwithstanding that the milk of some of the animals that shed *Brucella* in their milk was sold after pasteurization. Samples of milk from six cows, taken six weeks after pasteurization had begun, revealed the presence of *Brucella* in at least two of the animals.

A still further point that deserves comment is the evidence of confidence of the milk consumers in their health officer, and in the dairyman who had served them faithfully.

As has already been stated, the vendor's sales were only about 20 quarts less per day after pasteurization was begun. This indicates that a considerable number of the customers had sufficient confidence in the dairyman to continue the use of his milk after he had complied with the requirements of the health authorities in adopting measures to prevent further trouble.

The outbreak, therefore, caused a practical test of the efficiency of pasteurization in the prevention of undulant fever to be carried out under actual small-scale conditions. The results of this test have shown that pasteurization is an efficient measure of insurance against milk-borne undulant fever.

(NOTE.—On May 11, 1931, the order of the State Department of Health prohibiting the sale of raw milk from the plant of dairy A was

withdrawn, the owner having permanently disposed of all reacting animals. The withdrawal of this order made it permissible for dairy A to sell either raw or pasteurized milk.)

SUMMARY

1. Six cases of undulant fever occurred in a town of 5,387 population between September, 1930, and January, 1931.
2. All six cases used raw milk from the same dairy.
3. A large proportion of the cows in this herd gave laboratory evidence of *Brucella* infection, and the organism was recovered from the milk of some of them.
4. Pasteurization of the milk of this herd, even with infected animals remaining in the milking line, resulted in a cessation of cases in the consumers of the milk of this herd.

ACKNOWLEDGMENTS

It is desired to acknowledge our indebtedness to the New Jersey State Department of Health and its laboratory for information furnished from their records; to the New Jersey State Department of Agriculture for information concerning tests on the dairy herd; to the Experiment Station of the Bureau of Animal Industry, United States Department of Agriculture, at Bethesda, Md., for assistance in determining the presence of the organism in the milk of the herd; to the practicing physicians of Pitman who gladly gave every assistance possible; to the owner of the dairy A, who exhibited splendid cooperation and cheerfully gave the information sought; and to the individuals who gladly gave information concerning their illness in order that knowledge might be gathered that would assist in the prevention of further suffering and disease.

THE FUNCTIONS AND LIMITATIONS OF GOVERNMENT IN PUBLIC HEALTH EDUCATION

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All governmental public health activity must be based upon one of two functions:

- (1) Police power.
- (2) Public health education.

The activities of the early boards of health, State and local, of the past century, were based entirely upon police powers given them for the purpose of suppressing and preventing epidemic diseases. The powers given to the Secretary of the Treasury or to the United States Marine Hospital Service, now the United States Public Health Service, by acts of Congress in 1832, 1867, 1878, 1879, 1888, 1890, and

1893, were quarantine acts giving large police powers to prevent the introduction and spread of epidemic diseases. The acts of 1880 and 1882 and the joint resolution of Congress of 1888, established the "Epidemic Fund" to aid State or municipal boards of health, or otherwise to prevent introduction and spread of epidemic diseases. It was these acts which established the Marine Hospital Service as the Public Health Service of the United States, although the name was not changed until the present century.

In the closing decades of the nineteenth century, local boards of health found that rigid quarantine and other police power methods did not suppress epidemics. At first the doctors were blamed for delay or failure in reporting cases, but the real cause was found in the discovery of "carriers" of disease, persons who harbor a pathogenic parasite but show no symptoms, and in many mild cases for which no doctor was called. Even for the epidemic and communicable diseases alone, police power ordinances failed to solve the problem. Toward the close of the last century also, careful study of the functions, powers, and duties of health departments made it clear that a health department's scope of activity should include not only the communicable diseases, but also the noncommunicable diseases, and the improvement, conservation, and maintenance of health. These expansions of function, in which police power had no place, necessitated development of the only instrument that could influence them, viz, public health education.

Health officers gave up the idea that all public health work could be done by personnel on the pay roll of the health department. It was obvious that the education of individuals in personal hygiene and the securing of their voluntary help in preventing disease involved the participation of many agencies, official and unofficial, outside the health department.

In the first decade of this century unofficial voluntary agencies undertook public health activities of great importance and wide scope, and boards of education developed plans and procedures in school hygiene. The responsibility for the health of the people was still squarely placed upon the shoulders of the health officer, yet a large part of the work necessary to discharge his obligation had to be done by personnel not under his direct control. The health officer, therefore, evolved from a policeman vainly striving to stamp out epidemic disease, into a constructive statesman, courteous and persuasive, who could weld together into one united power the forces engaged in public health activities.

The most striking thing in this evolution is the change in the relative importance of work done on these two basic functions. While police power activity has dwindled to a routine procedure with its minimum utilization, the importance of public health edu-

cation has grown steadily as the more effective instrument and will grow much farther and faster in the future.

DEVELOPMENT OF PUBLIC HEALTH EDUCATION

For years after the leading public health administrators realized the need of public health education, they were unable to secure funds for such a purpose. The unofficial agencies were able to secure funds, and so they developed rapidly. In the past two decades school medical inspection and its branches, all of which are forms of public health education, made considerable progress, because often school funds were available when board of health funds were not.

Public health education depends upon research as a foundation and upon demonstration as a means of building the superstructure. In this field the great foundations have been very active in research, demonstration, or both. The work of the Rockefeller Foundation and that of insurance companies, corporations, and universities not operated by the State government, stand out prominently in modern public health development.

What is public health education? When a health administrator essays to answer this question he is appalled by its magnitude. There are many narrow definitions which may be given by health workers in their own special field. There are drives for specific purposes which are public health education in its best sense; but public health education as a whole is so complex and consists of so many independent efforts that its scope and potentialities are tremendous. Federal, State, and municipal governments are responsible for a great part of what should be done in this field and should exercise a supervising control over the remainder. There are some exceptions to this, theoretically, viz, the educational work of the endowed foundations, of the great insurance companies, of large corporations, and of the great unofficial health organizations; but, in fact, all of these are willing to correlate their work with official programs, where these exist or where such programs are wise and comprehensive enough to embrace them. Any effort to cover this subject in the brief time at my disposal must obviously be restricted to fundamentals, excluding details entirely.

GOVERNMENT—FEDERAL, STATE, AND LOCAL

As to the limitations of government in public health education, they are few. After getting away from police power, which has many limitations, we find for public health education only the lack of funds, and the lack of voluntary cooperation in individuals or groups, apathetic or complacent, who do not desire education.

FEDERAL GOVERNMENT

The Federal Government operates in public health education in two ways: (1) Direct to the citizens; and (2) through official State organizations. The products of its research are available to all by both methods. The demonstrations of how the knowledge available may be applied are made in cooperation with State departments.

Perhaps the most striking example of Federal activity was the venereal disease campaign prosecuted vigorously during and immediately following the World War. Ample funds permitted a synchronous attack on this problem in 48 States with the most complete and diversified educational propaganda ever used up to that time. Similarly, demonstrations were made which were purely educational in cooperation with States in such problems as malaria, hookworm, and pellagra. Federal surveys beginning 20 years ago showing the relation between sewage pollution of water supplies and high typhoid fever rates were responsible in no small measure for the enormous reduction in typhoid fever death rates, especially in the Great Lakes Basin. The United States Public Health Service research work in Rocky Mountain spotted fever, tularaemia, and undulant fever is of more recent date.

THE STATE GOVERNMENT

State health departments have utilized Federal research literature and demonstrations and have made research and demonstrations of their own in specially selected counties. In this they have also been aided often by the cooperation of the Rockefeller Foundation. This kind of demonstration is very effective public health education. When one full-time county health department is created and functions well, other counties learn the lesson and imitate the procedure. The State health departments also utilize all the methods of public health education for dissemination of knowledge, viz, literature, lectures, moving pictures, radio, and similar means.

LOCAL GOVERNMENTS

In the last analysis the most important governmental jurisdiction in public health education is the local government, because it is the government of the local unit which comes into direct contact with the individual. Local governments may utilize Federal or State literature, methods, demonstrations, or advice, but these, to be effective, must be applied locally. The scope of this paper will not permit me to go into details of all the methods available, literature, demonstrations, lectures, moving pictures, the radio, and others; but I desire to stress the greatest single instrument which we possess for public health education, an instrument still only partially developed and none too well coordinated with general public health programs.

SCHOOL HYGIENE

Excluding for the moment the special drives for better water supply, for annual physical examinations, for early diagnosis of tuberculosis or cancer, and many others, we have for our general objective 365 days in the year, personal hygiene for the discovery and correction of defects, for building up body resistance, for the prevention of diseases, and for the improvement and maintenance of health.

From the simple inspection for detection and prevention of the spread of communicable diseases, school hygiene has expanded to include medical inspection of school children, early discovery of defects of disease and undernourishment, and the teaching of personal hygiene. The medical inspection of school children, quite aside from the discovery of defects, has a great value as an educational influence on the other children and on the parents and family. Some few mistakes have been made—methods have been strongly advocated and then dropped; perhaps too much stress has been placed on standards—yet the net result is a tremendous achievement. Through the teachers in the schools we have the machinery for applying the latest knowledge at an age when great good can be accomplished.

The work of public health nurses in the schools is a bright chapter of achievement. Too often, however, the nurse is struggling with an overload of from 5,000 to 7,000 pupils with only the help of teachers with no training in applied child hygiene. The greatest single defect in the system is untrained teachers. The school physician can give little time, the school nurse has too many pupils, and the teacher too often knows little of teaching personal or child hygiene. The child is under the care and supervision of the teacher daily through the entire school year. Here is the greatest opportunity we have for teaching personal hygiene.

To determine the most effective machinery available for this general purpose of personal hygiene, we must answer two questions, viz:

(1) At what age does the human being most easily acquire knowledge?

(2) In what age group is he most completely and continuously under our control for teaching purposes?

The answer to both questions is the same, namely, the school age group. So that with these questions answered the most effective instrument for the general purpose of teaching personal hygiene and preventive medicine is our public school system.

GRADE SCHOOLS

There are obvious reasons why teaching personal hygiene in simple attractive form should be done in the grades from one to eight. I will mention only the facts that the young child grasps the simple truths of

personal hygiene more eagerly, and that a large proportion of pupils leave school at or before the eighth grade and therefore are no longer available for teaching purposes.

HIGH SCHOOLS

On the other hand, details more difficult to grasp, of nutrition, maternity, and paternity, are best taught to the high-school group.

COLLEGES

Going still higher into the college group of students, we have our greatest defect in failure to teach teachers to become teachers of personal hygiene in the elementary grades. Agricultural colleges and other colleges with extension courses and other efforts in home economics have a very great value, because of our primary general objective to build up body resistance by the use of proper diet.

The average teachers' college or normal school teaches hygiene to its embryo teachers in an uninteresting, didactic way. There should be less emphasis on lectures and more on practical demonstration of applied child hygiene, using the city schools as a clinic to instruct groups of student teachers.

We have not yet reached the point where all or even half of the teachers in elementary schools have received as much as two years' training beyond high school. For the teachers who have not had this college training, summer schools and extension courses will help to train some until the day when all teachers must be graduates of a teachers' college which gives an adequate practical course in applied child hygiene. Such a course is possible only by having on the regular faculty of teachers' colleges and normal schools a pediatrician and a highly trained and experienced nurse in school hygiene.

NEED FOR CORRELATION OF PUBLIC HEALTH EDUCATION ACTIVITIES

The State health department is charged with the health of all the people in all age groups; yet the most effective instrument is logically and properly placed in the department of education. There must be a correlation of all these activities in a state-wide program, with uniform application of this composite program locally.

HOW CORRELATION CAN BE SECURED

This can best be effected by a State public health council for the department of health which will include the superintendent of public instruction, president of the teachers' college, and the other heads of institutions who are engaged in this most important work of public health education.

The important thing for administrators to remember is that it matters little by whom the work is done, provided it is well done. Public health education has grown up in a haphazard manner, fostered by a score of agencies, official and unofficial. The time has arrived when the man charged with the responsibility for the health of all the people of a State—the State health officer—should take stock of what has been done and is being done by these diverse agencies. He should formulate with their help a comprehensive program to include all existing public health education activities and to expand the work or create new work so that the field may be as completely covered as possible.

INSPECTION OF SHIPS FOR DETERMINATION OF MOSQUITO INFESTATION

By W. F. TANNER, *Surgeon, United States Public Health Service*

A study of the prevalence of mosquitoes on vessels arriving at the ports of New York and New Orleans from ports in South and Central America and the West Indies was begun in the summer of 1929 at the suggestion of Medical Director Carroll Fox, of the Public Health Service, medical officer in charge of the New York quarantine station. Interest was awakened in this subject by the recent occurrence of yellow fever in South America, with a corresponding increase of responsibility on the quarantine officers of the Public Health Service.

The problem involves a determination of the extent to which modern vessels sailing under present day conditions may be responsible for the spread of yellow fever by transporting the vector of this disease, *Aedes aegypti*, and to enable comparison of the findings with related studies made in connection with sailing vessels.

EARLIER REPORTS OF MOSQUITOES ON VESSELS

The writer has been unable to find an account of a comparable study covering steamships except an article entitled "Mosquitoes on Ships Arriving in the Port of Liverpool from West Africa," appearing in the *Annals of Tropical Medicine and Parasitology*, volume 21, No. 4, December 31, 1927. In this article Newstead and Carter report the inspection between May, 1920, and March, 1921, of 22 ships. In only one ship were mosquitoes found, and in this vessel three female *Culex fatigans* were caught. The vessel had been invaded when lying about one-half mile off Port Gentil, and mosquitoes had been active on board up to within a two days' run from Liverpool.

The literature bearing on the occurrence of mosquitoes on sailing vessels, although appearing quite limited in extent, is extremely interesting and valuable. In the publication "Are Vessels Infected with Yellow Fever? Some Personal Observations," by Surg.

H. R. Carter, of the Public Health Service, published as Yellow Fever Institute Bulletin No. 9, July 1902, the author gives his experience with a series of sailing vessels on which yellow fever occurred during the years 1888-1890 under circumstances proving the presence on board of infected *Aedes* mosquitoes. Doctor Carter cites two instances of infection occurring on steamships—one reported by Rosenau, occurring in 1899, and the other occurring in 1900. The replacing of sailing craft by steamships is given as a principal factor for the decrease of infection on vessels during the decade preceding publication. "Vessels as Carriers of Mosquitoes," by Passed Asst. Surg. S. B. Grubbs, of the Public Health Service, published as Yellow Fever Institute Bulletin No. 11, March, 1903, reports the examination of 82 vessels arriving at the Gulf quarantine station on Ship Island, Miss., in 1902, from ports believed to have been infested with *Aedes* mosquitoes. Only four of these vessels were steamships, and on these no mosquitoes were found. *Culex* mosquitoes were found on 10 sailing vessels and *Aedes* were found on three sailing vessels. The author concluded that *Culex* mosquitoes in several instances invaded the vessels in great numbers at distances of 15 to 20 miles from land, and that *Aedes* mosquitoes invaded vessels in two instances while lying one-half mile from shore. The author's citation that 3½ per cent of the vessels brought *Aedes* is in interesting contrast with Doctor Carter's expressed belief that vessels plying to and from southern ports of the United States during the summer season generally have *Aedes* aboard. Passed Asst. Surg. Edward Francis, in the Annual Report of the Surgeon General of the Public Health Service for 1906, reported an inspection of the holds of 10 ships while bananas were being unloaded. Not a mosquito was seen; and the author suggested that reference to mosquitoes in such vessels might have been due to the presence of a gnat which he saw among the bananas.

THE PRESENT STUDY

Ships from Brazilian ports were included in this survey because of the immediate importance of these ports as actual or potential yellow-fever centers. Vessels from Central America and the West Indies were regarded as otherwise more suitable, because of the increased probability of bringing in mosquitoes.

We were able to make inspections only on arrival in New York. In view of the necessity for observations on the invasion of ships by mosquitoes, their continuation on board with and without opportunity for breeding, and their disappearance from the vessel, it was desirable to establish a connection with a shipping company and to secure their cooperation in the study. The United Fruit Co. appeared to

offer the best possible advantages, with their fleet of combined passenger and fruit vessels. These ships call at ports in various parts of the American tropics, and they carry medical officers. The medical department of the company readily agreed to make inspections on their vessels as outlined by us and to submit reports and specimens collected.

INSPECTIONS AT NEW YORK QUARANTINE

An appended form (Sta. File B-20) indicates the scope of the investigation on each vessel. This form may be conveniently described as consisting of three parts, viz, (A) the caption, (B) the legend, and (C) the inspection.

The caption identifies the vessel and gives the date, time utilized, and the names of the inspectors. The legend is a history of the voyage as it relates to the mosquito sanitation of the vessel and was obtained from a responsible ship's officer, with such corroborating testimony as was available. Lastly the portions of the ship inspected are stated and the results are given.

It is believed that the mosquito history of the voyage as obtained may, in a general way be accepted as fairly accurate. To obtain the confidence of the informant, assurances were given that the data were sought for purely scientific reasons and would not be used in any way detrimental to the interests of the vessel. The questioning of several persons independently usually revealed practically identical results. However, there appeared to be a general tendency to overestimate the frequency and efficiency of the use of an insecticide which had been employed on every vessel inspected.

It was understood that no vessel was to be delayed on account of the inspection. This necessitated very rapid work and limited the extent of the procedure. In a few cases the inspectors went up the bay on board and in this way were enabled practically to cover the ship.

The selected part of the vessel was examined thoroughly. The inspector, armed with a flash light and a wide-mouthed bottle (for making catches), searched carefully all nooks, corners, closets, underbunks, and overhead. After the examination with all objects in place had been completed, clothing, bedding, life preservers, or other movable objects were freely disturbed to see whether any mosquitoes had been overlooked.

All inspections included a search for potential breeding places in that part of the ship inspected.

In all, 11 inspections of ships were made. Brief reports on these ships are presented later.

INSPECTIONS ON VESSELS OF THE UNITED FRUIT CO.

The United Fruit Co. operates a fleet of 10 vessels plying between New York and ports in Central America, South America, and the West Indies, and a fleet of 12 vessels between New Orleans and these ports.

The ship surgeons were provided with blank forms for making reports and with mimeographed instructions outlining the procedure to be followed. At the end of each voyage the report was delivered to the Public Health Service officer inspecting the vessel in quarantine, who delivered it, along with specimens of mosquitoes caught, to the laboratory of the New York quarantine station. All specimens were sent to the United States National Museum at Washington for identification.

A total of 18 reports were received from 9 vessels entering New York, and 16 reports were received from 10 vessels entering New Orleans. Some of the vessels did not report at all and some others reported on only a few voyages. Specimens of mosquitoes caught accompanied four of the reports at New York and seven of the reports at New Orleans. Reports from New Orleans covered the period from the middle of June to the latter part of July, 1929, whereas reports were made at New York covering the period from the beginning of June to approximately the middle of September, 1929.

A blank report form and copy of instructions to the ship surgeon are appended.

A brief résumé of the report covering each voyage is given later.

DISCUSSION

It was intended that a large number of ships would be inspected on arrival in New York quarantine, and for this purpose the services of available medical officers or other trained employees were to be utilized. However, the regular work of the station proved too much to allow the use of the personnel to more than a very limited extent, especially since the summer is also the principal season of annual leave taking. The dearth of personnel resulted in the inspection of only a few vessels.

Every vessel inspected in New York reported the use of an insecticide. As the various compartments were inspected, stewards were questioned as to the frequency and quantity of the insecticide used, and there appeared to be a striking correlation between its use and the amount of insect life on the vessel. Whether or not its use was a factor in ridding the vessels of mosquitoes can only be conjectured.

Officers on several vessels volunteered their opinion that mosquitoes leave a ship within 48 to 60 hours after leaving port. They believed that this was due to the mosquitoes' dislike for the "salt air" at sea.

That the number of mosquitoes on the vessels inspected tended to decrease rapidly with increasing distance from port is clearly indicated.

Possible breeding places were not found on any of the vessels inspected at New York except the steamship "I", and no evidence of breeding was found. This vessel had been alongside at several ports in the Dominican Republic reported as heavily infested with mosquitoes. The noninfestation of the vessel is of interest. Information concerning the prevalence of mosquitoes about the docks, or weather and wind conditions, was not obtained.

The steamship "H" was the only vessel found infested on arrival. It was only three days from Habana. All mosquitoes found were caught. The history obtained indicated much heavier infestation at Habana.

Reports obtained from the ship surgeons of the fruit company's vessels were very meager as to the sanitary conditions about the piers, direction of the wind, and other related data. This was probably due to a lack of appreciation of what was desired.

Four specimens were submitted which were regarded as mosquitoes but which proved to be other insects. In three instances specimens of mosquitoes were present also.

Only one mosquito was identified as *Aedes aegypti* out of a total of 41 specimens submitted from the fruit vessels. None of the mosquitoes caught in New York belonged to this species. It appears unusual for vessels of the modern type to harbor *Aedes aegypti*.

An effort to tabulate the reports to show the relative sanitary condition of the ports visited, in regard to mosquito prevalence, met with many difficulties, owing to the lack of satisfactory data. However, Puerto Barrios, Guatemala, appeared to be the outstanding port where infestation was most often reported as heavy.

The accompanying table summarizes the most important data in connection with the mosquitoes caught on the fruit vessels.

TABLE 1.—Mosquitoes caught, showing kinds of mosquitoes and position of vessel in port

[Vessels of the United Fruit Co.]

Number of mosquitoes	Genus	Species	Approximate date caught, 1929	Place caught		Previous ports	Wharf or stream at port of capture	Name of vessel	Remarks
				In port at—	After leaving				
1	Aedes	Taeniorhynchus Wied.	June 21	Habana	Habana	Limon, Cristobal	Not stated	Tolos	
3	do	Sp? but not aegypti	June 27-28	Habana	Habana	None	Alongside	Ulua	
1	Culex	Quinquefasciatus Say	Sept. 13	Barrios	Barrios	Santiago, Kingston, Castilla, Tela	do	Tivives	
1	do	Sp?	June 22-23	do	do	Santiago, Kingston, Castilla, Tela, and Belize.	do	do	
2	do	Sp?	July 1-2	Habana	Habana	None	do	Heredia	
1	Aedes	Aegypti L.	July 22-24	do	do	do	do	do	
1	Culex	Quinquefasciatus Say	July 11	Habana	Habana	do	do	Cartago	
1	do	Sp?	July 7	Limon	Limon	Cristobal	do	Oppenheim	
4	Aedes	Sp? but not aegypti	June 24-26	Habana	Habana	None	do	Parinama	
2	do	do	June 26-28	do	do	do	do	do	
7	do	do	July 5	Habana	Habana	Habana, Cristobal	do	do	
2	do	do	July 8	Barrios	Barrios	Habana, Cristobal	do	do	
1	Culex	Taeniorhynchus Wied.	June 28	Habana	Habana	Cristobal, Barrios	do	do	
3	Aedes	Sp?	July 2	do	do	None	do	do	
3	Culex	Sp?	do	Barrios	Barrios	do	do	do	
1	do	Quinquefasciatus Say	July 4	Tela	Tela	do	do	A. Bangarez	
1	do	Sp?	July 7	do	do	Barrios	do	do	
4	do	Quinquefasciatus Say	July 18	Tela	Belize	Barrios and Tela	1½ miles in stream	do	Alongside at previous ports.
2	do	do	July 19	do	Barrios	Belize and Barrios	Alongside	do	Do.
2	do	do	do	do	do	Belize and Tela	¼ mile in stream	do	

When capture was made after leaving a port, reference is made to the position of the vessel at that port.

RECOMMENDATIONS

The study is of sufficient importance to be carried on. However, the time for the work is at the beginning of the ship's voyage rather than at its end, and the proper place is at the infested port. The placing of suitably trained personnel, under proper direction, in several selected ports, at times to accompany vessels on voyages to ports of the United States, would appear to be an appropriate research procedure. An additional factor of security from the introduction of yellow fever would be afforded by the observation and control of vessels entering yellow-fever ports and destined for our southern ports.

ACKNOWLEDGMENTS

The writer desires especially to express his appreciation of the cooperation rendered by Dr. W. E. Deeks, general manager of the medical department of the United Fruit Co., and the ships' officers who assisted so willingly. Our thanks are also due the United States National Museum for valuable assistance in the identification of specimens. Much helpful information and advice was given by Medical Director Carroll Fox, and the officers of the quarantine stations at New Orleans and New York rendered valuable assistance.

APPENDIX

VESSELS INSPECTED AT NEW YORK

(1) The steamship "A", passenger, arrived March 7 from Buenos Aires, Montevideo, Santos, Rio de Janeiro, Bahia, and Trinidad. It lay alongside piers in the first, third, and fourth ports, anchored in stream in the others. Three inspectors boarded it. The ship's surgeon reported that mosquitoes were on board in South American ports. The insecticide had been used about every second day.

Portion of ship inspected.—Crew's quarters, 6 or 8 rooms, and complete fore-castle; passenger department, complete third class, about 15 cabins in the second class, about 12 cabins in first class.

Results.—No evidence of mosquitoes or breeding places; a few flies seen.

Time of inspection.—Fifty-five minutes.

(2) The steamship "B", cargo, arrived March 28 from Rosario, Ibucuy, Santos, Port of Spain. It lay alongside piers in all ports except Port of Spain, where it anchored in stream $1\frac{1}{2}$ miles out. Two inspectors boarded it. The captain reported that a few mosquitoes were on board in the continental South American ports but none at Port of Spain. He stated that no mosquitoes were seen on board after two days out from port. The insecticide had been used every day or two against insects, with no particular reference to mosquitoes.

Portion of ship inspected.—Complete superstructure.

Results.—No evidence of mosquitoes or breeding places; a few flies, many roaches, and many spiders were seen.

Time of inspection.—Thirty-three minutes.

(3) The steamship "C", cargo, arrived March 28 from Bahia, Blanca, Buenos Aires, Montevideo, Santos, Rio de Janeiro, Bahia, and Trinidad. It lay alongside piers in all ports except the third (one-fourth mile out), fifth (one-half mile out) and seventh (distance not given). Two inspectors boarded it. The captain reported a few mosquitoes were on board in the first, second, and fourth

ports; none in the other ports. Insecticide had been used about three times a week throughout the superstructure against insects in general.

Portion of ship inspected.—All of crew's quarters and officers' cabins, mess room.

Results.—No evidence of mosquitoes or breeding places; a few flies, roaches, and other insects were seen.

Time of inspection.—Thirty-five minutes.

(4) The steamship "D", passenger, arrived April 3, from five eastern South American ports, via Trinidad, Barbados, and Martinique. It was alongside piers in all ports except Montevideo (one-fourth mile out), Barbados (1 mile out), and Martinique (1 mile out). Two inspectors boarded it. The purser reported that mosquitoes were seen on board at Buenos Aires but not at other ports. Insecticide was generally used but had not been used on the present northbound voyage.

Portion of ship inspected.—Entire third class, including cabins, saloons, closets, and hallways, and about 12 unoccupied cabins used for storage.

Result.—No evidence of mosquitoes or breeding places; a few moths, some small winged insects resembling a gnat, roaches, spiders, numerous cobwebs under bunks.

Time of inspection.—Forty-five minutes.

The presence of numerous insects is interesting in connection with the reported nonuse of the insecticide.

(5) The steamship "E", passenger, arrived from Buenos Aires, Montevideo, Santos, and Rio de Janeiro, via Trinidad, April 10. It was alongside piers in all ports except Montevideo (one-half mile out) and Trinidad (2½ miles out). Two inspectors boarded it. Mosquitoes were seen on board at Santos; reports from other ports were indefinite. The captain reported daily use of the insecticide after leaving Buenos Aires. This port had begun requiring antimosquito measures on shipboard.

Portion of ship inspected.—Entire crew's quarters and mail rooms.

Result.—No evidence of mosquitoes or breeding places. No insect life of any kind except one roach was seen.

Time of inspection.—Forty-five minutes.

The practical absence of insect life is interesting in view of the liberal use of the insecticide.

(6) The steamship "F", passenger, arrived April 20 from Buenos Aires, Montevideo, Santos, Rio de Janeiro, Trinidad, and Barbados. It was alongside piers in all ports except Montevideo (one-fourth mile out), Trinidad (4 miles out) and Barbados (one-half mile out). Two inspectors boarded it. Information was obtained from the purser and deck steward. Mosquitoes were seen on board at Buenos Aires, but not at other ports. Quarantined two days at Buenos Aires to complete a 6-day period, and ordered to use insecticide. Insecticide had been used daily throughout the voyage.

Portion of ship inspected.—Entire crew's quarters except officers' cabins, printing room.

Results.—No evidence of mosquitoes or breeding places; numerous roaches and a few flies were seen.

Time of inspection.—One hour.

The deck steward commented that mosquitoes were never seen on a ship after two days at sea.

(7) The steamship "G", passenger, arrived May 8 from Buenos Aires, Montevideo, Santos, Rio de Janeiro, Bahia, and Trinidad. It was alongside piers in all ports except Montevideo (one-half mile out), Bahia (2 miles out), and Trinidad (5 miles out). Two inspectors boarded it. Information was

obtained from the purser and purser's apprentice. Mosquitoes were seen on board in Buenos Aires and Rio de Janeiro. Quarantined at Buenos Aires to complete six days from last port and required to use insecticide. This was used about twice weekly throughout the superstructure.

Portion of ship inspected.—Complete inspection of crew's quarters and of third-class department.

Results.—No evidence of mosquitoes or breeding places; a few flies and a few roaches were seen.

Time of inspection.—One and one-half hours.

(8) The steamship "A", passenger, arrived from the same ports as in voyage No. 1 above. It lay alongside piers in all ports except Montevideo (one-fourth mile out), Bahia (one-half mile out), and Trinidad (3 miles out). Three inspectors boarded it. Information was obtained from the ship's surgeon, purser, freight clerk, and two passengers. The report was unanimous that no mosquitoes had been seen on board in any port. The insecticide had been used daily throughout the superstructure.

Portion of ship inspected.—All of crew's quarters except engine department and officers' cabins, all of third-class and second-class passenger departments, about half of first-class passenger department, animal room (occupied by parrots and monkeys).

Result.—No evidence of mosquitoes or breeding places; a few flies were seen in the animal room, otherwise no insect life was observed on the vessel.

Time.—Fifty minutes.

(9) The steamship "H", passenger, arrived June 4, 10 a. m. from Habana, having left that port June 1 at 11 a. m. Vessel lay alongside the pier at Habana. Two inspectors boarded it. Ship's surgeon minimized number of mosquitoes on board in Habana, whereas the third officer and members of the crew reported that many mosquitoes were on board in that port. Insecticide had been used every fourth day in first-class department, more sparingly and less often in the third-class, very irregularly or not at all in the crew's quarters. It had not been used in the crew's quarters on the present return voyage.

Portion of vessel inspected and results.—Crew's quarters: Two mosquitoes were caught in the engine crew's quarters, five were caught in the steward's sleeping quarters. Third class: Two mosquitoes caught (one in mess and one in sleeping quarters). First class: About half the cabins inspected and no mosquitoes were found, but one was caught in a steward's room in this department. Holds Nos. 1 and 2 were entered and inspected before the cargo (pineapple) was unloaded. Many gnats and flies were seen, but no mosquitoes.

No breeding places were found, but the inspection of the ship for this purpose was not sufficiently thorough entirely to exclude the possibility of breeding on board, although it is very unlikely. The ship had running water throughout and no known containers of stagnant water.

The mosquitoes were identified as *Culex quinquefasciatus* Say.

(10) The steamship "F", passenger, arrived June 26 from the same ports given for this vessel in No. 6 above. It lay alongside piers in all ports except Montevideo (one-fourth mile out), Rio de Janeiro (1 mile out), Trinidad (2 miles out), and Barbados (1 mile out). It was boarded by two inspectors. The captain reported that no mosquitoes had been observed on board during the voyage. It had remained in quarantine two days at Buenos Aires to complete a 6-day period from the last port (Rio de Janeiro). Buenos Aires authorities required the daily use of the insecticide on board, and it had been used daily throughout the superstructure during the voyage.

Portion of ship inspected.—The entire third-class department.

Result.—No evidence of mosquitoes or breeding places.

Time.—Forty minutes.

(11) The steamship "I", passenger, arrived August 26 from ports in the Dominican Republic, via Turck Island. The principal Dominican ports were Macoris, Azua, Barahona, Santo Domingo, La Romana, Samana, Sanchez, Puerto Plata, and Monte Cristi. The vessel was alongside piers at all ports except Samana, Sanchez and Turck Island, lying in stream half mile off shore at these places, and at Monte Cristi in stream 2 miles off shore. Information was obtained from the ship's surgeon, purser, chief steward, several passengers, and several members of the crew. Oddly enough there was unanimity of report that mosquitoes were very prevalent in almost all the ports entered, but that nowhere did they come on board the vessel. The insecticide was used three or four times during the entire voyage from New York and return (17 days).

Portion of ship inspected.—Entire crew's quarters, the entire passenger department, storerooms, portion of the holds.

Results.—No evidence of mosquitoes or breeding.

This is an old ship (built in 1902). There is no running water in the passenger cabins or crew's quarters. In several unoccupied cabins the water containers held stagnant water, dust having collected on the containers and on the surface of the water. Water from the condensation of steam had collected to a depth of 6 inches or more in a compartment beneath the floor supporting the windlass (aft). The exposed water surface was several feet across. This was clean water.

The reason for no breeding aboard the ship is not obvious. Clearly the potentiality is great. The ship surgeon was emphatic in saying, "The ports are full of mosquitoes but they do not come on the ship."

REPORTS ON VESSELS ENTERING NEW YORK

(1) "No. 1" left New York June 1, visited Habana, Cristobal, Limon, Cristobal, and Habana. The report of inspections was meager.

One "*Aedes taeniorhynchus* Wied." was caught 24 hours from Habana, northbound.

(2) "No. 2" left New York May 29, visited Kingston, Cristobal, Cartagena, Pto. Colombia, Santa Marta, and Kingston. Inspection report incomplete, but stated that no mosquitoes were found.

(3) "No. 3" left New York June 5, visited Kingston, Cristobal, Cartagena, Pto. Colombia, Santa Marta, and Kingston. Inspection report complete. No mosquitoes found.

(4) "No. 4" left New York June 8, visited Habana, Cristobal, Port Limon, Cristobal, and Habana. Arrived at Port Limon 8 a. m., June 20, 1929. At the inspection of the same date a diptera was caught on deck. This was identified as a "*Psilopus* sp." The report indicates that no mosquitoes were encountered during the voyage. (The diptera was reported by the ship's doctor as a mosquito.)

(5) "No. 5" left New York June 8, visited Santiago, Kingston, Port Castilla, Tela, Port Barrios, Belize, Port Barrios, Kingston, and Santiago. Fourteen diptera were caught and reported as mosquitoes. Thirteen of these were identified as "*Chironomus* sp." One mosquito was identified as a *Culex* (sp.?). This mosquito was caught at Port Barrios on return voyage (in the doctor's cabin.).

(6) "No. 1" left New York June 29. Stations visited are not given. The report was very meager and gives no further information than the statement that two passengers reported that they were bitten by mosquitoes at Cristobal.

(7) "No. 6" left New York June 22, visited Habana, Cristobal, Limon, Cristobal, and Habana.

Three mosquitoes, identified as "*Aedes*, species not determined but not *aegypti*," were caught at Habana on the outward voyage. Mosquitoes reported as numerous at Habana, few at Cristobal, none at other ports.

(8) "No. 3" left New York July 3, visited Kingston, Cristobal, Cartagena, Pto. Colombia, Santa Marta, and Kingston. The report states that not a single mosquito was found on the entire voyage. Daily inspections were reported.

(9) "No. 7" left New York July 11. The report is very meager. The words "no mosquitoes" were written across its face.

(10) "No. 8" left New York July 13, visited Habana, Cristobal, Limon, and Habana. The report states that no mosquitoes were seen on board.

(11) "No. 7" left New York July 20, visited Habana, Cristobal, Limon, Cristobal, and Habana. A few mosquitoes were on board at Cristobal, outward voyage. Otherwise none reported. None caught.

(12) "No. 2" left New York July 24, visited Kingston, Cristobal, Cartagena, Pto. Colombia, Santa Marta, Kingston. The report states that no mosquitoes were found on board during the voyage.

(13) "No. 1" left New York July 27. The report is very meager. It states that a number of passengers were bitten at Port Limon. No mosquitoes were caught.

(14) "No. 3" left New York July 31, visited Kingston, Cristobal, Cartagena, Pto. Colombia, and Santa Marta. Daily inspections are reported, but no mosquitoes were observed.

(15) "No. 5" left New York August 3. Ports visited are not reported. The report only states that no mosquitoes were found.

(16) "No. 5" left New York August 31, visited Santiago, Kingston, Castillo, Tela, Barrios, and Belize. One mosquito was caught at Barrios; no others seen. The mosquito was identified as a *Culex quinquefasciatus* Say.

(17) "No. 4" left New York August 31, visited Habana, Cristobal, Limon, Cristobal, and Habana. Daily inspections are reported, but no mosquitoes were found on board.

(18) "No. 3" left New York August 28, visited Kingston, Cristobal, Cartagena, Pto. Colombia, and Kingston. Daily inspection reports were made, but no mosquitoes were found on board.

REPORTS ON VESSELS ENTERING NEW ORLEANS

(1) "No. 9" left New Orleans June 15, visited Habana, Cristobal, Barrios, and Habana. Mosquitoes were reported on board, especially at Habana, but none was caught.

(2) "No. 10" left New Orleans June 15, visited Cristobal, Limon, Bocas del Toro, Almirante, and Cristobal. Daily inspections were reported but no mosquitoes were observed.

(3) "No. 11" left New Orleans June 19, visited Habana, Castilla, and Habana. A few mosquitoes were reported on board at Habana. None was caught.

(4) "No. 12" left New Orleans June 21, visited Belize, Barrios, Tela, and Barrios. A few mosquitoes were reported on board at Barrios. None was caught.

(5) "No. 13" left New Orleans June 22, visited Habana, Cristobal, Barrios, and Habana. Many mosquitoes were reported on board at Habana, few at Barrios. During this voyage 14 *Aedes*, species not determined but not *aegypti*, and one *Culex*, species not determined, were caught. Eleven *Aedes* and the *Culex* were caught either at Habana, outward bound or en route from Habana to Cristobal. These evidently came on board at Habana. Two *Aedes*, species not determined but not *aegypti*, were caught about one day after Barrios. One

Aedes, species not determined but not *aegypti*, was caught the second day after leaving Habana on the return voyage. This was the largest number of specimens submitted from any one voyage during the study.

(6) "No. 14" left New Orleans June 22, visited Cristobal, Pto. Colombia; Cristobal, Bocas del Toro, and Cristobal. A few mosquitoes were reported as observed at Bocas del Toro. None was reported at other ports. None was caught.

(7) "No. 15" left New Orleans June 26, visited Habana, Castilla, and Habana. *Culex* mosquitoes were reported on board in both ports. None was caught.

(8) "No. 16" left New Orleans June 28, visited Barrios, Tela, Barrios, and Belize. A few mosquitoes were reported on board at Barrios and Tela. None at Belize.

Three *Aedes taeniorhynchus* Wied. and one *Culex*, species undetermined, were caught at Barrios. Four *Culex quinquefasciatus* Say were caught at Tela. One *Culex*, species undetermined, was caught two days after leaving Belize; but since the vessel was anchored in the stream at Belize, 1½ miles out, and remained there only a few hours, it appears most likely that this mosquito came on board at a previous port.

(9) "No. 17" left New Orleans June 29, visited Habana, Cristobal, Barrios, and Habana. A few mosquitoes were reported on board at Habana, outward bound; none at other ports. The report states that the sanitary condition of Barrios in regard to mosquitoes was bad, but that the breeze was in the ship's favor and no mosquitoes came on board. Two *Culex*, species undetermined, were caught on board at Habana, outward voyage.

(10) "No. 18" left New Orleans June 29, visited Cristobal, Limon, and Almirante. A few mosquitoes were reported on board at Limon; none at other ports. Unfavorable breeze brought mosquitoes on board at Limon, where one *Culex*, species undetermined, was caught. Three other diptera were caught at Limon and were identified as "*Chironomus* sp."

(11) "No. 11" left New Orleans July 3, visited Habana, Castilla, and Habana. No mosquitoes were observed.

(12) "No. 12" left New Orleans July 5, visited Barrios, Tela, and Barrios. Many mosquitoes were reported on shore at Barrios, but the wind was in the ship's favor. Six diptera, supposedly mosquitoes, were caught on board at Barrios, but these were identified as "*Chironomus* p.," 2; "*Gnophomyia tristissima* O. S.," 2; "*Geronomyia rostrata* Say," 1; and "*Tricyphona hyperborea* O. S.," 1.

(13) "No. 9" left New Orleans July 6, visited Habana, Cristobal, Barrios, and Habana. Mosquitoes were reported prevalent on shore at Habana and Barrios. One *Culex quinquefasciatus* Say was caught one day after leaving Habana, outward voyage. Another diptera, supposedly a mosquito, caught the same day was identified as "*Chironomus* sp."

(14) "No. 15" left New Orleans July 10, visited Habana, Castilla, and Habana. A few mosquitoes were on board at Castilla, where the wind was from shore. No mosquitoes were caught.

(15) "No. 16" left New Orleans July 12, visited Belize, Barrios, Tela, and Barrios. A few mosquitoes were reported on board at Tela and Barrios, in spite of the fact that the vessel anchored one-third mile out at each port. However, the breeze was from the land. Four *Culex quinquefasciatus* Say were caught on board at Tela, and two *Culex quinquefasciatus* Say were caught one day after leaving Barrios on the return voyage.

(16) "No. 17" left New Orleans July 20, visited Habana, Cristobal, Barrios, and Habana. Three mosquitoes were seen on board at Habana, none at other ports. However, Barrios was reported in bad sanitary condition in regard to mosquitoes. One mosquito, caught at Habana, was identified as an *Aedes aegypti* L.

Forms Used for Inspection Report

MOSQUITO SURVEY

Sta. File B-20

 (Date) ----- (Vessel—Nationality, type, name) -----

 (Time) ----- (Inspection made by) -----

Port of Call	Date of arrival	Days	Position	Evidence mosquitoes on board	Precautions by port authority
1.-----	-----	-----	-----	-----	-----
2.-----	-----	-----	-----	-----	-----
3.-----	-----	-----	-----	-----	-----
4.-----	-----	-----	-----	-----	-----
5.-----	-----	-----	-----	-----	-----
6.-----	-----	-----	-----	-----	-----

History of mosquito infestation -----
 Precautions taken against mosquitoes -----

INSPECTION

Crews quarters -----
 Passenger department -----
 Other inspections -----
 Results -----
 Source of information -----
 Comment -----
 Laboratory identification -----

REPORT OF SHIP'S SURGEON

S. S. ----- United Fruit Co.
 Date of departure from New York -----
 New Orleans -----

Port of call	Date and hour of arrival	Date and hour of departure	Position of vessel in port ¹	Relative numbers and varieties of mosquitoes on board while in port	Sanitary condition of port in regard to mosquitoes
1.-----	-----	-----	-----	-----	-----
2.-----	-----	-----	-----	-----	-----
3.-----	-----	-----	-----	-----	-----
4.-----	-----	-----	-----	-----	-----
5.-----	-----	-----	-----	-----	-----
6.-----	-----	-----	-----	-----	-----

¹ If anchored in stream, how far from nearest inhabited shore. If at a wharf or dock, are there any mosquito-breeding receptacles?

Describe possible breeding places on the vessel and note whether breeding actually occurs:

When mosquitoes are found to have come on board at a port, describe direction and approximate velocity of the wind, so as to indicate whether or not this may have been a factor:

Please catch mosquitoes every day that they can be found on the ship. It would be very valuable if mosquitoes of every species seen on board are caught. A wide-mouthed test tube should be used, in the bottom of which should be placed elastic bands which have been soaked in chloroform, held to the bottom with a disk of blotting paper. This tube should be kept closed. Mosquitoes caught should be shaken out into a pill box and held in place by small pieces of crumpled tissue paper. (Cotton is not desirable because the mosquitoes become entangled in the cotton fibers.) The pill boxes should be dated and labeled to show the location on the vessel where the mosquitoes were taken.

Please fill in daily inspection report on sheet 2.

DAILY INSPECTION REPORT
(To begin on arrival at first port of call)

Date	Part of ship inspected	Time duration of inspection	Prevalence of mosquitoes	Kinds of mosquitoes	Number caught
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----

Ship's Surgeon.

Please deliver this report, together with specimens of mosquitoes and any other pertinent information to the quarantine doctor at New York quarantine, or if your vessel does not enter New York, deliver to the Public Health Service doctor making the quarantine inspection with request that he transmit them by mail to United States quarantine station, Rosebank, Staten Island, N. Y.

**INSTRUCTIONS TO SHIP SURGEONS FOR PREPARATION OF THE REPORT ON THE
MOSQUITO SURVEY**

In cooperation with the United States Public Health Service a study of the carrying of mosquitoes by vessels is being made. The doctors on our vessels are requested to take part in this study and to make observations to determine the presence of mosquitoes on board. A blank report form will be supplied for each trip. This form will be carefully completed and will be delivered, together with specimens collected, to the Public Health Service doctor boarding the vessel at quarantine, with the request that they be delivered or mailed to the United States quarantine station, Rosebank, Staten Island, N. Y.

The explanations below will assist you in preparing the report:

Port of call.—Each port at which the vessel stops after leaving the United States is a port of call. An accurate record of the position of the vessel in port is of extreme importance. If anchored in stream the distance from the wharf and also the distance from the nearest inhabited shore should be stated. If lying alongside the wharf, the distance from the nearest inhabited shore should be shown. The presence or absence of mosquito-breeding about the pier, or wharf, is important.

The relative numbers of mosquitoes on board while in port may be stated in general terms, as "very numerous," "many," "moderate," "few," "none," or other terms which may best apply to the situation. Identification of varieties may be made, but in any case it is desirable to catch a sufficient number to include the different varieties which are present. Entry in the space for this information may best be made on leaving the port from memoranda on observations made from time to time.

A description of the sanitary condition of the port in regard to mosquitoes may be made from observations made on this and previous trips, from information obtained from various sources, and possibly from the local health authorities. The condition at and about the docks is especially important.

Information as to breeding places, or their absence, on the vessel is desirable, since otherwise the significance of mosquitoes on the ship remains in doubt.

A description of the prevailing wind, to indicate whether or not mosquitoes may have been blown onto the vessel, is desirable. This is of more importance when mosquitoes have appeared on the ship while anchored in stream.

An important part of this study consists in a determination of the length of time mosquitoes remain on the ships after leaving port. To this end it is necessary to make an inspection of the ship daily, both while in port and each day thereafter throughout the voyage. Such an inspection should include all parts of the ship to which mosquitoes may gain access. Enough test tubes, prepared as

described, should be carried for making the catches. An inspection during the late afternoon may be made if the vessel arrives in the first port during the forenoon; if arriving after midday the inspection on the vessel may be deferred to the next day. Thereafter one inspection each day, at a convenient hour, may be made. Those inspections should continue until the ship returns to the United States port. A careful survey of the sides and overhead of the compartment, underneath and behind beds, in closets and nooks, and finally disturbing, or removing articles of clothing or other objects affording hiding places, may often result in finding mosquitoes that otherwise would not be seen. The *Aedes* is especially likely to be found resting in shady corners on dark objects hanging around the room, and such objects should, therefore, be inspected before being disturbed. The use of a flash-light is regarded as indispensable.

In filling in the daily inspection report considerable care as to detail is desirable. Although it would be ideal to have a daily inspection throughout the entire vessel, including crews' quarters, passenger departments, closets, pantries, galleys, holds, etc., you may not find it practicable to make such complete inspections every day. Therefore, please record the inspection as actually made each day.

Doctors on our vessels are instructed to carry out these instructions.

Respectfully,

W. E. DEEKS,
General Manager, Medical Department.

COURT DECISION RELATING TO PUBLIC HEALTH

Ordinance prohibiting sale in city of ice manufactured outside of city, unless made with distilled water, held void.—(Texas Court of Civil Appeals; City of El Paso et al. v. Jackson et al., 40 S. W. (2d) 845; decided June 25, 1931.) An ordinance of the city of El Paso provided as follows:

SECTION 1. It shall be unlawful for any person, firm, or corporation to sell or offer for sale or distribute in the city of El Paso any ice manufactured outside the city of El Paso, except ice manufactured wholly with distilled water.

SEC. 2. Any person violating the foregoing ordinance shall be deemed guilty of a misdemeanor and shall be fined the sum of \$10, and each sale or offering for sale shall constitute a separate offense.

A suit was brought against the city and certain of its officials to restrain them from enforcing or attempting to enforce the said ordinance. The trial court held the ordinance void, such action being based upon the conclusion that it was discriminatory and imposed a burden on interstate commerce. On appeal the judgment enjoining the enforcement of the ordinance was affirmed by the court of civil appeals. That court said that there was ample evidence to the effect that the cost of making ice from distilled water was about 50 per cent more than the cost of making it from raw water, and that the enforcement of the ordinance could have but one practical result,

namely, a denial of the right of a citizen outside of the city to sell his ice therein. In summing up its conclusions, the court said:

We have concluded that, under the facts in this record, the effect of the ordinance is to create a monopoly in favor of those manufacturing ice in the city; is an unreasonable discrimination against people living outside the city; and imposes a burden upon interstate commerce.

DEATHS DURING WEEK ENDED SEPTEMBER 5, 1931

Summary of information received by telegraph from industrial insurance companies for the week ended September 5, 1931, and corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended September 5, 1931	Corresponding week, 1930
Policies in force.....	74, 961, 597	75, 680, 042
Number of death claims.....	11, 715	10, 059
Death claims per 1,000 policies in force, annual rate....	8.1	6.9
Death claims per 1,000 policies, first 36 weeks of year, annual rate.....	10.0	9.8

Deaths¹ from all causes in certain large cities of the United States during the week ended September 5, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

[The rates published in this summary are based upon mid-year population estimates derived from the 1930 census]

City	Week ended Sept. 5, 1931				Corresponding week, 1930		Death rate ² for the first 36 weeks	
	Total deaths	Death rate ²	Deaths under 1 year	Infant mortality rate ³	Death rate ²	Deaths under 1 year	1931	1930
Total (82 cities).....	6, 684	9.8	588	4.46	10.2	643	12.3	12.2
Akron.....	30	6.1	3	30	10.2	5	7.9	8.0
Albany ⁴	30	12.1	4	79	15.5	3	13.9	15.2
Atlanta.....	73	13.7	8	82	13.2	9	15.4	16.0
White.....	32		5	79		4		
Colored.....	41	(⁵)	3	86	(⁵)	5	(⁵)	(⁵)
Baltimore ⁴	182	11.7	18	61	12.7	24	14.8	14.3
White.....	129		10	43		12		
Colored.....	53	(⁵)	8	125	(⁵)	12	(⁵)	(⁵)
Birmingham.....	72	13.9	9	91	18.1	11	14.0	14.1
White.....	26		4	69		5		
Colored.....	46	(⁵)	5	122	(⁵)	6	(⁵)	(⁵)
Boston.....	173	11.5	15	43	11.9	16	14.4	14.4
Bridgeport.....	35	12.4	2	33	12.1	6	11.4	11.4
Buffalo.....	110	9.9	7	29	14.0	16	13.4	13.2
Cambridge.....	31	14.2	4	80	7.8	1	12.5	11.9
Camden.....	19	8.3	2	35	12.3	4	14.7	13.9
Canton.....	19	9.3	3	69	5.4	1	10.4	10.3
Chicago ⁵	556	8.4	47	42	8.9	45	11.0	10.6
Cincinnati.....	122	13.9	15	90	14.2	12	16.3	15.8
Cleveland.....	169	9.7	21	61	9.9	13	11.4	11.4
Columbus.....	60	10.6	5	49	10.4	11	13.9	16.0
Dallas.....	41	7.9	3		9.5	5	11.5	11.9
White.....	27		2			3		
Colored.....	14	(⁵)	1		(⁵)	2	(⁵)	(⁵)
Dayton.....	31	7.8	4	56	9.8	4	12.0	10.5
Denver.....	77	13.8	10	97	13.2	12	14.2	15.0
Des Moines.....	37	13.3	2	35	9.1	0	11.3	12.0
Detroit.....	211	6.7	18	29	6.9	25	8.5	9.6

See footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended September 5, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930—Continued

City	Week ended Sept. 5, 1931				Corresponding week, 1930		Death rate for the first 36 weeks	
	Total deaths	Death rate	Deaths under 1 year	Infant mortality rate	Death rate	Deaths under 1 year	1931	1930
Duluth	18	9.2	1	25	8.7	3	11.1	11.3
El Paso	31	15.4	4		16.7	9	16.3	18.0
Erle	17	7.5	1	19	8.5	2	10.9	11.4
Fall River ¹	18	8.1	2	45	6.8	1	11.6	12.2
Flint	11	3.5	1	13	8.3	4	7.1	9.4
Fort Worth	34	10.6	4		8.3	0	11.0	11.2
White	29		4			0		
Colored	5	(⁹)	0		(⁹)	0	(⁹)	(⁹)
Grand Rapids	38	11.5	3	44	8.6	4	9.3	10.5
Houston	71	11.9	5		9.0	6	11.3	12.3
White	48		4			6		
Colored	23	(⁹)	1		(⁹)	0	(⁹)	(⁹)
Indianapolis	82	11.6	7	58	13.4	9	14.2	15.0
White	68		7	66		9		
Colored	14	(⁹)	0	0	(⁹)	0	(⁹)	(⁹)
Jersey City	51	8.3	7	62	9.9	7	11.8	11.6
Kansas City, Kans.	17	7.2	0	0	14.5	4	12.9	11.6
White	16		0	0		4		
Colored	1	(⁹)	0	0	(⁹)	0	(⁹)	(⁹)
Kansas City, Mo.	73	9.3	4	30	11.9	8	13.4	13.4
Knoxville	15	7.2	3	64	3.9	1	12.5	14.0
White	12		2	48		1		
Colored	3	(⁹)	1	204	(⁹)	0	(⁹)	(⁹)
Long Beach	24	8.2	0	0	9.4	3	9.9	10.0
Los Angeles	185	7.3	17	49	7.9	10	10.8	11.2
Louisville	70	11.8	8	69	9.7	3	14.6	13.9
White	51		5	49		3		
Colored	19	(⁹)	3	199	(⁹)	0	(⁹)	(⁹)
Lowell ¹	20	10.4	1	25	10.4	4	12.7	13.8
Lynn	11	5.6	1	26	6.6	1	9.8	10.7
Memphis	87	17.5	12	127	12.1	5	16.7	17.7
White	46		7	117		2		
Colored	41	(⁹)	5	145	(⁹)	3	(⁹)	(⁹)
Miami	11	5.1	0	0	14.1	2	12.0	11.4
White	8		0	0		2		
Colored	3	(⁹)	0	0	(⁹)	0	(⁹)	(⁹)
Milwaukee	92	8.1	10	43	9.1	14	9.6	9.8
Minneapolis	64	7.0	6	39	10.3	6	11.5	10.7
Nashville	30	10.1	3	45	12.9	6	17.0	16.9
White	15		2	40		5		
Colored	15	(⁹)	1	59	(⁹)	1	(⁹)	(⁹)
New Bedford ¹	21	9.7	2	53	6.5	2	12.5	11.1
New Haven	32	10.3	0	0	8.7	1	12.5	13.2
New Orleans	152	17.0	12	66	15.3	6	17.3	17.7
White	87		7	58		4		
Colored	65	(⁹)	5	81	(⁹)	2	(⁹)	(⁹)
New York	1,219	9.0	112	47	9.2	99	11.5	11.1
Bronx Borough	163	6.4	19	43	7.6	6	8.4	8.1
Brooklyn Borough	410	8.1	42	45	7.8	36	10.6	10.1
Manhattan Borough	481	13.8	28	65	13.3	41	17.5	16.5
Queens Borough	123	5.6	10	27	6.0	13	7.4	7.2
Richmond Borough	42	13.4	3	54	18.0	3	14.0	14.7
Newark, N. J.	83	9.7	9	47	10.4	5	11.9	12.3
Oakland	41	7.3	3	38	9.3	2	10.6	11.1
Oklahoma City	48	12.7	12	165	10.0	4	14.2	10.7
Omaha	41	9.9	1	11	11.2	4	14.1	13.9
Paterson	28	10.5	2	34	13.9	5	13.7	12.6
Peoria	20	9.6	1	26	7.9	3	12.8	12.7
Philadelphia	370	9.8	28	41	10.7	45	13.5	12.8
Pittsburgh	165	12.7	16	55	10.4	16	14.9	14.0
Portland, Oreg.	55	9.3	3	36	8.6	2	11.7	12.4
Providence	66	13.5	11	101	10.1	5	13.1	13.3
Richmond	49	13.9	5	73	13.4	6	16.0	15.3
White	34		4	88		2		
Colored	15	(⁹)	1	43	(⁹)	4	(⁹)	(⁹)
Rochester	68	10.7	9	82	11.7	7	12.1	11.8
St. Louis	189	11.9	10	34	11.6	12	15.7	14.6
St. Paul	47	8.9	2	21	9.8	2	11.0	10.2
Salt Lake City ¹	32	11.7	4	60	9.6	5	12.3	12.7
San Antonio	58	12.6	10		11.8	9	14.9	17.3
San Diego	38	12.7	3	61	15.0	3	13.8	14.6

See footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended September 5, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930—Continued

City	Week ended Sept. 5, 1931				Corresponding week, 1930		Death rate for the first 36 weeks	
	Total deaths	Death rate	Deaths under 1 year	Infant mortality rate	Death rate	Deaths under 1 year	1931	1930
San Francisco.....	139	11.2	4	27	14.5	8	13.2	13.1
Schenectady.....	19	10.3	2	59	10.9	0	10.8	11.5
Seattle.....	75	10.5	1	9	9.1	3	11.6	11.1
Somerville.....	13	6.4	1	37	6.0	3	9.2	10.0
South Bend.....	8	3.9	0	0	7.5	4	8.1	9.0
Spokane.....	20	9.0	1	26	13.1	1	12.3	12.4
Springfield, Mass.....	32	11.0	3	46	7.6	1	12.0	12.4
Syracuse.....	41	10.0	4	47	9.9	3	11.8	11.8
Tacoma.....	19	9.2	1	26	9.3	1	12.1	12.8
Toledo.....	59	10.4	2	18	10.5	5	12.2	12.8
Trenton.....	31	13.1	2	35	14.8	4	16.8	17.0
Utica.....	16	8.2	0	0	11.3	3	14.2	15.1
Washington, D. C.....	112	11.8	4	22	14.0	13	16.1	15.5
White.....	71		2	16		7		
Colored.....	41	(⁶)	2	34	(⁶)	6	(⁶)	(⁶)
Waterbury.....	19	9.8	2	60	6.8	2	9.8	10.1
Wilmington, Del.....	24	11.7	2	43	12.7	4	14.2	14.6
Worcester.....	38	10.0	2	27	11.2	4	12.4	13.2
Yonkers.....	24	9.0	2	52	9.2	3	8.9	8.3
Youngstown.....	25	7.5	0	0	10.4	3	10.4	10.3

¹ Deaths of nonresidents are included. Stillbirths are excluded.

² These rates represent annual rates per 1,000 population, as estimated for 1931 and 1930 by the arithmetical method.

³ Deaths under 1 year of age per 1,000 live births. Cities left blank are not in the registration area for births.

⁴ Data for 77 cities.

⁵ Deaths for week ended Friday.

⁶ For the cities for which deaths are shown by color, the percentage of colored population in 1920 was as follows: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Miami, 31; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

⁷ Population Apr. 1, 1930; decreased 1920 to 1930, no estimate made.

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 September 12, 1931, and September 13, 1930

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended September 12, 1931, and September 13, 1930

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930
New England States:								
Maine.....	3	1		1	9	15	0	0
New Hampshire.....		2		5			0	0
Vermont.....	1	1			4		0	0
Massachusetts.....	33	40	12	1	18	30	1	0
Rhode Island.....	4	1			6	1	0	1
Connecticut.....	8	7	3	1	2	4	0	1
Middle Atlantic States:								
New York.....	56	48	14	16	48	53	10	13
New Jersey.....	12	35	1	1	7	15	1	1
Pennsylvania.....	68	94			64	81	1	5
East North Central States:								
Ohio.....	73	31	15	14	12	12	1	6
Indiana.....	15	11	13		6	2	1	4
Illinois.....	45	88	51	3	25	7	4	4
Michigan.....	15	38		2	7	6	2	6
Wisconsin.....	12	8	4	12	27	27	0	3
West North Central States:								
Minnesota.....	8	13		1	7	2	1	0
Iowa.....	5	2			2	2	1	1
Missouri.....	25	19	3	3	3	7	5	5
North Dakota.....	1	6			5		0	0
South Dakota.....	1	25			2	1	1	0
Nebraska.....	9	2	2			1	0	0
Kansas.....	11	15	2	1	5	9	0	1
South Atlantic States:								
Delaware.....		4				2	0	0
Maryland ¹	15	12	3	5	9	3	1	1
District of Columbia.....	7	10			1	2	2	0
Virginia.....								
West Virginia.....	13	14	9	4	6	6	1	0
North Carolina.....	79	118	2	24	6	5	1	2
South Carolina.....	16	41	121	177	7		0	2
Georgia ²	55	23	28	21	7	6	1	1
Florida.....	5	8	1		2		0	0

¹ New York City only.

² Week ended Friday.

³ Typhus fever: 1931, 5 cases in Georgia.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended September 12, 1931, and September 13, 1930—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930
East South Central States:								
Kentucky.....	39				11		1	0
Tennessee.....	74	12	23		1	7	2	2
Alabama.....	72	27	3	6	20	2	1	1
Mississippi.....	99	18					1	0
West South Central States:								
Arkansas.....	20	1			2		2	1
Louisiana.....	31	12	8	9	1	3	1	0
Oklahoma.....	43	16	3	11	2	1	0	3
Texas.....	21	25	1	30		1	0	1
Mountain States:								
Montana.....	8				6	2	0	1
Idaho.....	1					2	0	0
Wyoming.....					2	1	0	2
Colorado.....	5	6				3	0	1
New Mexico.....	2	5		3	1	1	1	0
Arizona.....	3	2	3	3	2		0	1
Utah.....			2	2	1	2	0	0
Pacific States:								
Washington.....	3	6			2	10	2	0
Oregon.....	1	4	7	8	5	11	0	0
California.....	29	24	15	13	39	47	3	5

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930
New England States:								
Maine.....	2	10	4	4	0	0	3	2
New Hampshire.....	6	1	2	3	0	0	1	0
Vermont.....	12	0	1	2	1	0	0	0
Massachusetts.....	127	21	73	55	0	0	3	14
Rhode Island.....	21	1	12	4	0	0	2	3
Connecticut.....	92	0	3	14	0	0	7	12
Middle Atlantic States:								
New York.....	430	60	95	72	0	0	42	66
New Jersey.....	94	3	18	23	0	0	21	21
Pennsylvania.....	14	8	71	83	0	0	37	103
East North Central States:								
Ohio.....	23	65	172	85	4	31	67	79
Indiana.....	4	13	44	25	20	13	22	11
Illinois.....	39	35	94	75	7	13	23	41
Michigan.....	114	10	61	79	6	0	36	20
Wisconsin.....	83	8	19	22	1	4	4	7
West North Central States:								
Minnesota.....	48	28	24	23	1	0	7	4
Iowa.....	5	20	11	2	8	11	2	0
Missouri.....	2	12	6	18	3	0	29	28
North Dakota.....	5	1	0	7	1	0		11
South Dakota.....	1	7	3	10	2	3	1	0
Nebraska.....	1	17	6	14	3	14	2	4
Kansas.....	1	71	16	39	0	2	8	13
South Atlantic States:								
De aware.....	0	0	3	4	0	0	3	12
Maryland.....	1	0	17	11	0	0	35	58
District of Columbia.....	0	0	5	3	0	0	5	5
Virginia.....	2							
West Virginia.....	5	3	11	22	0	3	47	54
North Carolina.....	3	5	58	47	0	0	32	17
South Carolina.....	0	1	8	19	0	0	67	60
Georgia.....	1	1	25	2	0	0	78	46
Florida.....	0	0	0	3	0	0	0	1

¹ Week ended Friday.

² Typhus fever: 1931, 5 cases in Georgia.

³ Figures for 1931 are exclusive of Oklahoma City and Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended September 12, 1931, and September 13, 1930—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930	Week ended Sept. 12, 1931	Week ended Sept. 13, 1930
East South Central States:								
Kentucky.....	1	1	35	14	0	1	56	31
Tennessee.....	5	2	25	22	1	1	87	41
Alabama.....	4	0	45	22	0	0	39	22
Mississippi.....	1	1	25	11	3	1	37	22
West South Central States:								
Arkansas.....	0	2	17	0	1	0	37	27
Louisiana.....	0	7	10	5	3	0	61	19
Oklahoma ⁴	0	12	14	17	5	9	47	39
Texas.....	1	2	22	4	6	12	35	13
Mountain States:								
Montana.....	3	0	3	15	0	0	8	4
Idaho.....	0	0	2	5	1	0	1	2
Wyoming.....	0	2	1	2	1	0	5	0
Colorado.....	0	1	10	6	0	0	4	14
New Mexico.....	1	0	1	1	0	0	3	13
Arizona.....	0	0	3	7	0	0	3	5
Utah.....	0	0	3	3	0	0	1	3
Pacific States:								
Washington.....	1	2	12	29	2	12	11	5
Oregon.....	0	1	4	4	4	0	11	9
California.....	7	56	32	37	1	11	16	17

¹ Week ended Friday.

⁴ Figures for 1931 are 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	Ma- laria	Mea- sles	Pel- lagra	Polio- myel- itis	Scarlet fever	Small- pox	Ty- phoid fever
<i>July, 1931</i>										
Mississippi.....	1	45	169	4,807	55	1,329	10	18	60	265
<i>August, 1931</i>										
Alabama.....	17	112	18	396	64	122	4	85	4	255
Arkansas.....	3	58	5	266	5	199	1	8	18	206
Connecticut.....	3	20	7	-----	72	-----	417	39	0	17
District of Columbia	1	24	3	-----	8	3	3	16	0	6
Indiana.....	15	52	23	2	54	1	10	80	61	67
New Jersey.....	11	64	6	1	98	-----	354	117	0	37
North Dakota.....	4	17	2	-----	31	-----	3	14	20	43
Ohio.....	8	101	26	3	162	-----	42	351	18	179
South Carolina.....	-----	72	435	2,307	52	539	4	21	0	355
Tennessee.....	13	57	41	250	36	56	6	94	20	514

<i>July, 1931</i>		<i>August, 1931</i>	
	Cases		Cases
Mississippi:		Chicken pox:	
Anthrax.....	1	Alabama.....	19
Chicken pox.....	193	Arkansas.....	2
Dengue.....	2	Connecticut.....	31
Dysentery (amebic).....	105	District of Columbia.....	10
Hookworm disease.....	246	Indiana.....	11
Mumps.....	75	New Jersey.....	35
Ophthalmia neonatorum.....	12	North Dakota.....	12
Puerperal septicaemia.....	26	Ohio.....	58
Rab'ys in animals.....	9	Tennessee.....	12
Trachoma.....	3	Dengue:	
Whooping cough.....	837	South Carolina.....	24

	Cases		Cases
Dysentery:		Rabies in animals:	
New Jersey.....	3	Connecticut.....	2
Ohio.....	5	South Carolina.....	12
Tennessee.....	37	Rabies in man:	
Food poisoning:		Alabama.....	1
Ohio.....	10	Rocky Mountain spotted or tick fever:	
German measles:		District of Columbia.....	2
Connecticut.....	5	Tennessee.....	1
New Jersey.....	10	Septic sore throat:	
Ohio.....	12	Connecticut.....	10
Tennessee.....	10	North Dakota.....	1
Hookworm disease:		Ohio.....	49
South Carolina.....	126	Tennessee.....	12
Tennessee.....	1	Tetanus:	
Impetigo contagiosa:		Connecticut.....	1
Tennessee.....	5	New Jersey.....	1
Lead poisoning:		North Dakota.....	1
Connecticut.....	1	Ohio.....	1
New Jersey.....	1	Tennessee.....	4
Ohio.....	7	Trachoma:	
Lethargic encephalitis:		Arkansas.....	5
Alabama.....	4	Indiana.....	1
Connecticut.....	5	New Jersey.....	2
District of Columbia.....	2	North Dakota.....	1
New Jersey.....	1	Ohio.....	8
North Dakota.....	2	Trichinosis:	
Ohio.....	3	New Jersey.....	1
South Carolina.....	2	Typhus fever:	
Tennessee.....	1	Alabama.....	12
Mumps:		South Carolina.....	4
Alabama.....	15	Undulant fever:	
Arkansas.....	17	Alabama.....	3
Connecticut.....	70	Connecticut.....	1
Indiana.....	16	District of Columbia.....	1
New Jersey.....	63	Indiana.....	1
North Dakota.....	22	New Jersey.....	3
Ohio.....	139	Ohio.....	12
South Carolina.....	25	Tennessee.....	2
Tennessee.....	23	Vincent's angina:	
Ophthalmia neonatorum:		North Dakota.....	35
New Jersey.....	5	Whooping cough:	
Ohio.....	92	Alabama.....	62
South Carolina.....	21	Arkansas.....	36
Tennessee.....	4	Connecticut.....	289
Paratyphoid fever:		District of Columbia.....	81
Arkansas.....	2	Indiana.....	171
Connecticut.....	5	New Jersey.....	1,260
New Jersey.....	3	North Dakota.....	121
Ohio.....	9	Ohio.....	772
South Carolina.....	25	South Carolina.....	170
Tennessee.....	4	Tennessee.....	254
Puerperal septicemia:			
Ohio.....	3		

RECIPROCAL NOTIFICATIONS

Notifications regarding communicable diseases sent during the month of June, 1931, by departments of health of certain States to other State health departments

Disease	California	Connecticut	Illinois	Kansas	Minnesota	New York	Washington
Gonorrhoea.....					1		
Measles.....		1				2	
Scarlet fever.....			1		1	1	
Smallpox.....			2		1		
Syphilis.....				3	3		1
Trachoma.....					1		
Tuberculosis.....	2		1		33		
Typhoid fever.....	2					2	

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 96 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 33,170,000. The estimated population of the 90 cities reporting deaths is more than 31,660,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended September 5, 1931, and September 6, 1930

	1931	1930	Estimated expectancy
<i>Cases reported</i>			
Diphtheria:			
46 States.....	841	770	
96 cities.....	234	252	376
Measles:			
45 States.....	431	414	
96 cities.....	122	151	
Meningococcus meningitis:			
46 States.....	56	72	
96 cities.....	19	24	
Poliomyelitis:			
46 States.....	1,369	422	
Scarlet fever:			
46 States.....	1,012	946	
96 cities.....	306	264	251
Smallpox:			
46 States.....	79	175	
96 cities.....	9	19	5
Typhoid fever:			
46 States.....	953	1,072	
96 cities.....	126	130	164
<i>Deaths reported</i>			
Influenza and pneumonia:			
90 cities.....	315	336	
Smallpox:			
90 cities.....	0	0	

City reports for week ended September 5, 1931—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
WEST NORTH CENTRAL								
Minnesota:								
Duluth.....	2	0	0		0	0	0	0
Minneapolis.....	0	10	2		0	0	2	5
St. Paul.....		4						
Iowa:								
Davenport.....	1	0	0			0	0	
Des Moines.....	0	0	0			0	0	
Sioux City.....	0	0	1			0	2	
Waterloo.....	0	0	0			1	1	
Missouri:								
Kansas City.....	0	1	2		0	3	0	3
St. Joseph.....	0	0	0		0	0	0	1
St. Louis.....	0	14	4			0	3	10
North Dakota:								
Fargo.....	0	0	0		0	0	0	0
Grand Forks.....	0	0	0			0	0	
South Dakota:								
Aberdeen.....	2	0	0			0	1	
Nebraska:								
Omaha.....	0	3	3		0	0	0	0
Kansas:								
Topeka.....	1	0	0	1	1	0	1	1
Wichita.....	0	0	0		0	0	0	1
SOUTH ATLANTIC								
Delaware:								
Wilmington.....	0	0	0		0	0	2	2
Maryland:								
Baltimore.....	3	12	6		1	1	1	12
Cumberland.....	0	0	0		0	0	0	1
Frederick.....	0	0	0		0	0	0	0
District of Columbia:								
Washington.....	0	7	0		0	1	0	2
Virginia:								
Lynchburg.....	0	1	2		0	1	0	1
Norfolk.....	2	0	0		0	0	0	0
Richmond.....	0	8	1		0	0	0	2
Roanoke.....	0	2	2		0	0	0	0
West Virginia:								
Charleston.....	0	1	2		0	0	0	0
Wheeling.....	0	0	0		0	0	0	2
North Carolina:								
Raleigh.....	1	1	0		0	1	0	0
Wilmington.....	0	1	0		0	0	0	0
Winston-Salem.....	0	2	1		0	0	1	1
South Carolina:								
Charleston.....	0	0	0	3	0	0	0	0
Columbia.....	0	0	0		0	0	0	1
Greenville.....	0	1	0		0	0	0	0
Georgia:								
Atlanta.....	0	2	3	1	0	0	0	5
Brunswick.....	0	0	0		0	0	0	0
Savannah.....	0	0	0	10	0	0	2	1
Florida:								
Miami.....	0	1	0		0	0	0	0
Tampa.....	0	1	0		0	0	0	1
EAST SOUTH CENTRAL								
Kentucky:								
Covington.....	0	0	0		0	0	0	2
Tennessee:								
Memphis.....	1	1	6		0	0	1	3
Nashville.....	0	1	4		0	0	0	0
Alabama:								
Birmingham.....	0	3	1		1	1	1	1
Mobile.....	0	0	1		0	0	0	0
Montgomery.....	0	1	2	1		0	0	

City reports for week ended September 5, 1931—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
WEST SOUTH CENTRAL								
Arkansas:								
Fort Smith.....		0						
Little Rock.....	0	0	0		1	0	0	2
Louisiana:								
New Orleans.....	0	6	11	2	2	0	0	7
Shreveport.....	0	0	2		0	0	1	0
Oklahoma:								
Muskogee.....	0	0	0		0	0	0	0
Oklahoma City..	1	1	0		1	0	0	3
Tulsa.....	0	0	4			0	0	
Texas:								
Dallas.....	0	5	5		0	0	0	1
Fort Worth.....	0	2	0		0	0	0	0
Galveston.....	0	0	0		0	0	0	4
Houston.....	0	3	7		0	0	0	7
San Antonio.....	0	2	6		0	0	0	3
MOUNTAIN								
Montana:								
Billings.....	0	0	0		0	3	0	0
Great Falls.....	1	0	0		0	2	0	0
Helena.....	0	0	0		0	0	0	0
Missoula.....	0	0	0		0	0	0	0
Idaho:								
Boise.....	0	0	0		0	0	0	0
Colorado:								
Denver.....	0	7	6		0	1	2	7
Pueblo.....	0	1	0		0	0	0	2
New Mexico:								
Albuquerque.....	0	1	0		0	0	0	0
Arizona:								
Phoenix.....	0	1	0	0	0	0	0	1
Utah:								
Salt Lake City..	3	2	0		0	0	0	2
Nevada:								
Reno.....	0	0	0		0	0	0	0
PACIFIC								
Washington:								
Seattle.....	2	2	0			4	0	
Spokane.....	0	1	0			0	0	
Tacoma.....	0	1	0		0	1	0	0
Oregon:								
Portland.....	0	4	0		0	1	2	0
Salem.....	0	0	0	2	0	0	0	0
California:								
Los Angeles.....	4	18	8	13	0	6	5	2
Sacramento.....	0	1	6		0	3	1	1
San Francisco....	1	6	0	1	1	20	0	5

City reports for week ended September 5, 1931—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
WEST NORTH CENTRAL—CON.											
Missouri:											
Kansas City.....	3	2	0	1	0	3	2	0	0	4	73
St. Joseph.....	1	0	0	0	0	0	0	1	0	0	13
St. Louis.....	10	8	0	0	0	15	6	2	0	30	189
North Dakota:											
Fargo.....	1	0	0	0	0	0	0	0	0	6	-----
Grand Forks.....	0	0	0	0	-----	-----	0	1	-----	0	-----
South Dakota:											
Aberdeen.....	1	0	0	0	-----	-----	0	0	-----	0	-----
Nebraska:											
Omaha.....	1	2	0	1	0	2	0	0	0	2	41
Kansas:											
Topeka.....	1	1	0	0	0	0	0	0	0	0	9
Wichita.....	1	0	0	0	0	0	2	0	0	0	25
SOUTH ATLANTIC											
Delaware:											
Wilmington....	0	0	0	0	0	1	1	1	0	0	24
Maryland:											
Baltimore.....	5	2	0	0	0	10	8	8	1	73	182
Cumberland.....	0	1	0	0	0	1	1	1	1	0	11
Frederick.....	0	0	0	0	0	0	1	0	0	0	3
Dist. of Columbia:											
Washington....	4	2	0	0	0	9	3	1	1	15	112
Virginia:											
Lynchburg.....	0	3	0	0	0	0	1	2	0	0	9
Norfolk.....	0	6	0	0	0	0	2	1	1	2	-----
Richmond.....	3	3	0	0	0	3	2	2	0	1	47
Roanoke.....	1	0	0	0	0	1	0	0	1	1	15
West Virginia:											
Charleston.....	1	0	0	0	0	3	2	1	0	0	30
Wheeling.....	1	1	0	0	0	0	1	1	0	0	8
North Carolina:											
Raleigh.....	0	0	0	0	0	2	0	0	0	2	11
Wilmington....	0	0	0	0	0	1	0	0	0	1	3
Winston-Salem	1	3	0	0	0	1	1	0	0	10	13
South Carolina:											
Charleston.....	0	0	0	0	0	0	3	1	0	0	19
Columbia.....	0	0	0	0	0	2	1	0	0	0	22
Greenville.....	0	1	1	0	0	0	0	0	0	0	-----
Georgia:											
Atlanta.....	4	5	0	0	0	5	4	5	0	2	73
Brunswick.....	0	0	0	0	0	0	0	0	0	0	1
Savannah.....	0	1	0	0	0	2	1	2	0	0	24
Florida:											
Miami.....	0	0	0	0	0	0	0	0	0	0	11
Tampa.....	1	0	0	0	0	3	1	0	0	0	23
EAST SOUTH CENTRAL											
Kentucky:											
Covington.....	0	4	0	0	0	0	0	0	0	0	27
Tennessee:											
Memphis.....	1	4	0	0	0	8	8	4	1	14	87
Nashville.....	1	0	-----	0	0	1	6	2	1	0	30
Alabama:											
Birmingham..	4	2	0	0	0	5	4	1	0	0	72
Mobile.....	0	2	0	0	0	1	1	0	1	0	19
Montgomery....	0	3	0	0	-----	-----	0	0	-----	0	-----

City reports for week ended September 5, 1931—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culo- sis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith.....	0	0	0	0	0	1	0	0	1	0	6
Little Rock.....	0	0	0	0	0	0	2	0	0	0	0
Louisiana:											
New Orleans.....	2	8	0	0	0	15	4	5	2	3	152
Shreveport.....	0	2	0	0	0	0	1	0	1	6	30
Oklahoma:											
Muskogee.....	0	0	0	0	0	0	0	1	1	0	0
Oklahoma City.....	1	2	0	1	0	0	3	3	0	0	48
Tulsa.....	0	2	0	1	0	0	1	0	0	2	0
Texas:											
Dallas.....	2	4	0	0	0	3	2	4	3	6	41
Fort Worth.....	1	2	0	1	0	0	1	1	0	0	0
Galveston.....	0	0	0	0	0	1	0	0	0	0	18
Houston.....	1	1	0	0	0	4	1	12	1	0	71
San Antonio.....	2	1	0	0	0	11	1	1	1	0	58
MOUNTAIN											
Montana:											
Billings.....	0	0	0	0	0	0	0	0	0	2	8
Great Falls.....	0	0	0	0	0	0	0	0	0	0	13
Helena.....	0	0	0	0	0	0	0	0	0	0	0
Missoula.....	0	0	0	0	0	0	0	0	0	0	2
Idaho:											
Boise.....	0	0	0	0	0	0	0	0	0	0	5
Colorado:											
Denver.....	3	1	0	0	0	5	1	3	0	14	75
Pueblo.....	0	0	0	0	0	1	0	0	0	0	10
New Mexico:											
Albuquerque.....	0	0	0	0	0	2	1	1	0	0	5
Arizona:											
Phoenix.....	0	0	0	0	0	1	0	0	1	0	0
Utah:											
Salt Lake City.....	2	2	0	0	0	0	2	2	0	4	32
Nevada:											
Reno.....	0	0	0	0	0	0	0	0	0	0	1
PACIFIC											
Washington:											
Seattle.....	3	7	0	1	0	0	2	1	0	15	0
Spokane.....	2	0	1	0	0	0	0	0	0	0	0
Tacoma.....	1	1	1	0	0	0	0	0	0	6	19
Oregon:											
Portland.....	2	1	3	5	0	1	0	1	0	1	55
Salem.....	0	0	0	0	0	0	0	0	0	0	0
California:											
Los Angeles.....	7	8	1	0	0	15	3	1	0	14	185
Sacramento.....	1	0	0	0	0	2	0	1	0	5	22
San Francisco.....	5	6	1	0	0	9	0	2	0	13	146

City reports for week ended September 5, 1931—Continued

Division, State, and city	Meningo-coccus meningitis		Lethargic encephalitis		Pollagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Maine:									
Portland.....	0	1	0	0	0	0	0	0	1
New Hampshire:									
Concord.....	0	0	0	0	0	0	0	1	0
Nashua.....	0	0	0	0	0	0	0	2	0
Massachusetts:									
Boston ¹	0	0	1	2	0	0	4	46	2
Fall River.....	0	0	0	0	0	0	0	1	0
Springfield.....	0	0	0	0	0	0	0	10	0
Worcester.....	0	0	0	0	0	0	0	4	0
Rhode Island:									
Providence.....	0	0	0	0	0	0	0	17	0
Connecticut:									
Bridgeport.....	0	0	0	0	0	0	0	2	0
Hartford.....	0	0	0	1	0	0	0	30	1
New Haven.....	0	0	0	0	0	0	0	18	0
MIDDLE ATLANTIC									
New York:									
Buffalo.....	0	0	0	0	0	0	2	1	0
New York.....	5	3	0	2	0	0	11	347	38
Rochester.....	0	0	0	0	0	0	0	2	0
New Jersey:									
Newark.....	1	0	0	0	0	0	1	7	0
Pennsylvania:									
Philadelphia.....	0	2	0	0	1	1	1	6	1
Pittsburgh.....	0	0	0	2	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati.....	1	0	0	0	0	0	0	0	0
Cleveland.....	1	0	0	0	0	1	2	7	0
Toledo.....	0	0	0	0	0	0	0	0	1
Indiana:									
Fort Wayne.....	0	0	0	0	0	0	0	1	0
Illinois: ¹									
Chicago.....	2	2	0	0	0	0	3	5	0
Michigan:									
Detroit.....	0	0	2	0	0	0	2	17	1
Flint.....	0	0	0	0	0	0	0	1	0
Grand Rapids.....	0	0	0	0	0	0	0	4	0
Wisconsin:									
Madison.....	0	0	0	0	0	0	0	9	0
Milwaukee.....	0	0	0	0	0	0	0	5	0
Superior.....	0	0	0	0	0	0	0	2	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth.....	0	0	0	0	0	0	0	8	0
Minneapolis.....	1	1	0	0	0	0	0	5	0
Iowa:									
Des Moines.....	0	0	0	0	0	0	0	1	0
Missouri:									
St. Louis.....	2	1	0	0	0	0	1	2	0
Nebraska:									
Omaha.....	0	0	0	0	0	0	1	1	0

¹ Typhus fever, 8 cases: 1 case at Boston, Mass.; 1 case at Springfield, Ill.; 1 case at Norfolk, Va.; 4 cases at Savannah, Ga.; and 1 case at Fort Worth, Tex.

City reports for week ended September 5, 1931—Continued

Division, State, and city	Meningo- coccus meningitis		Lethargic en- cephalitis		Pellagra		Poliomyelitis (infan- tile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, esti- mated expect- ancy	Cases	Deaths
SOUTH ATLANTIC									
Maryland:									
Baltimore.....	0	0	1	1	0	0	1	0	1
Virginia:									
Norfolk ¹	0	0	0	0	0	0	0	2	1
West Virginia:									
Charleston.....	1	0	0	0	0	0	0	0	0
Wheeling.....	0	0	0	0	0	0	0	2	0
North Carolina:									
Wilmington.....	0	0	0	0	0	0	0	1	0
South Carolina:									
Columbia.....	0	0	0	0	0	3	0	0	0
Georgia:									
Atlanta.....	0	0	0	0	2	2	1	0	0
Savannah ¹	0	0	0	0	1	1	0	0	0
Florida:									
Miami.....	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis.....	0	1	0	0	2	1	0	2	0
Nashville.....	0	0	0	0	1	0	1	0	0
Alabama:									
Birmingham.....	1	1	0	0	1	1	1	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock.....	0	0	0	0	0	1	0	1	0
Louisiana:									
New Orleans.....	1	1	0	0	1	1	0	0	0
Texas:									
Dallas.....	0	0	0	0	0	1	0	0	0
Fort Worth ¹	0	0	0	0	0	0	1	1	0
MOUNTAIN									
Arizona:									
Phoenix.....	0	0	0	1	0	0	0	0	0
PACIFIC									
Washington:									
Seattle.....	1	0	0	0	0	0	0	0	0
Oregon:									
Portland.....	0	0	0	0	0	0	0	1	0
California:									
Los Angeles.....	2	0	0	0	1	0	2	5	0
San Francisco.....	0	0	1	0	2	0	0	0	0

¹ Typhus fever, 8 cases: 1 case at Boston, Mass.; 1 case at Springfield, Ill.; 1 case at Norfolk, Va.; 4 cases at Savannah, Ga.; and 1 case at Fort Worth, Tex.

The following tables give the rates per 100,000 population for 98 cities for the 5-week period ended September 5, 1931, compared with those for a like period ended September 6, 1930. The population figures used in computing the rates are estimated mid-year populations for 1930 and 1931, respectively, derived from the 1930 census. The 98 cities reporting cases have an estimated aggregate population of more than 33,000,000. The 91 cities reporting deaths have more than 31,500,000 estimated population.

Summary of weekly reports from cities, Aug. 2 to Sept. 5, 1931.—Annual rates per 100,000 population compared with rates for the corresponding period of 1930¹

DIPHTHERIA CASE RATES

	Week ended—									
	Aug. 8, 1931	Aug. 9, 1930	Aug. 15, 1931	Aug. 16, 1930	Aug. 22, 1931	Aug. 23, 1930	Aug. 29, 1931	Aug. 30, 1930	Sept. 5, 1931	Sept. 6, 1930
98 cities.....	21	37	32	31	30	33	31	38	37	40
New England.....	65	34	41	44	67	44	41	53	55	39
Middle Atlantic.....	26	32	26	22	19	27	18	29	24	29
East North Central.....	31	48	30	36	28	40	33	45	38	43
West North Central.....	29	29	36	27	31	25	36	27	26	35
South Atlantic.....	26	18	43	38	24	40	63	64	34	66
East South Central.....	41	18	17	30	35	12	52	12	81	43
West South Central.....	64	49	47	49	68	63	34	66	107	56
Mountain.....	26	18	78	18	44	44	17	70	52	44
Pacific.....	18	57	31	30	35	22	24	16	27	32

MEASLES CASE RATES

	60	49	39	32	29	28	22	20	19	24
98 cities.....	60	49	39	32	29	28	22	20	19	24
New England.....	135	99	79	65	63	65	63	22	58	36
Middle Atlantic.....	57	61	32	39	25	31	13	22	14	27
East North Central.....	87	27	61	19	37	21	23	7	11	17
West North Central.....	15	52	11	31	13	19	8	27	9	31
South Atlantic.....	34	24	10	24	20	20	4	32	8	23
East South Central.....	12	18	23	18	23	6	6	12	6	24
West South Central.....	3	10	0	7	7	0	24	10	0	0
Mountain.....	70	115	61	44	70	26	52	35	52	54
Pacific.....	43	63	49	43	22	40	53	30	67	34

SCARLET FEVER CASE RATES

	46	31	33	30	43	32	41	41	48	42
98 cities.....	46	31	33	30	43	32	41	41	48	42
New England.....	43	46	53	56	99	51	46	56	87	60
Middle Atlantic.....	51	20	31	17	38	25	30	26	87	24
East North Central.....	60	45	48	39	57	35	43	47	56	47
West North Central.....	19	27	23	29	19	35	31	43	30	58
South Atlantic.....	38	20	22	28	36	30	30	72	51	77
East South Central.....	41	12	41	48	17	30	70	102	87	60
West South Central.....	41	35	17	31	27	35	64	14	55	63
Mountain.....	61	70	26	44	44	88	165	88	26	28
Pacific.....	22	38	10	32	31	28	39	26	43	26

¹ The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1931, and 1930, respectively.

² Terre Haute, Ind., not included.

³ St. Paul, Minn., and Fort Smith, Ark., not included.

⁴ St. Paul, Minn., not included.

⁵ Fort Smith, Ark., not included.

Summary of weekly reports from cities, Aug. 2 to Sept. 5, 1931.—Annual rates per 100,000 population compared with rates for the corresponding period of 1930—Con.

SMALLPOX CASE RATES

	Week ended—									
	Aug. 8, 1931	Aug. 9, 1930	Aug. 15, 1931	Aug. 16, 1930	Aug. 22, 1931	Aug. 23, 1930	Aug. 29, 1931	Aug. 30, 1930	Sept. 5, 1931	Sept. 6, 1930
98 cities.....	3	3	1	3	1	2	1	2	1	3
New England.....	0	0	0	0	0	0	0	0	0	0
Middle Atlantic.....	0	0	0	0	0	0	0	0	0	0
East North Central.....	2	6	1	3	10	0	10	0	4	2
West North Central.....	13	6	8	6	6	8	4	8	4	14
South Atlantic.....	2	2	2	0	4	2	4	0	0	4
East South Central.....	0	0	0	6	0	0	0	0	0	0
West South Central.....	0	7	0	3	0	7	0	3	0	0
Mountain.....	9	0	9	0	0	0	0	0	0	0
Pacific.....	14	4	2	12	4	10	4	10	2	12

TYPHOID FEVER CASE RATES

98 cities.....	22	17	21	20	21	19	22	24	20	21
New England.....	14	5	26	5	5	17	22	12	7	12
Middle Atlantic.....	16	10	14	14	14	13	20	20	13	20
East North Central.....	10	11	7	10	11	9	10	10	16	12
West North Central.....	19	19	13	29	19	21	13	19	6	14
South Atlantic.....	53	66	77	44	55	60	38	88	49	58
East South Central.....	29	60	70	132	70	78	47	42	41	48
West South Central.....	95	14	45	42	91	24	98	66	76	45
Mountain.....	44	35	44	26	9	26	9	44	44	9
Pacific.....	14	10	12	12	8	6	12	8	10	8

INFLUENZA DEATH RATES

91 cities.....	2	3	3	1	2	3	2	4	2	3
New England.....	2	0	0	0	2	0	0	0	2	0
Middle Atlantic.....	3	2	3	2	2	3	2	3	1	3
East North Central.....	1	1	2	0	2	1	1	4	1	2
West North Central.....	0	3	3	3	3	0	3	3	3	6
South Atlantic.....	0	10	4	0	6	8	6	8	2	8
East South Central.....	13	0	6	0	0	0	13	6	6	0
West South Central.....	3	0	7	0	0	4	0	7	10	11
Mountain.....	0	18	17	0	0	9	0	0	0	9
Pacific.....	5	5	2	0	7	7	2	2	2	0

PNEUMONIA DEATH RATES

91 cities.....	48	52	45	53	48	45	48	52	50	53
New England.....	34	46	29	41	36	56	46	51	24	56
Middle Atlantic.....	52	56	56	68	56	53	60	57	62	65
East North Central.....	35	47	37	27	32	27	26	50	33	36
West North Central.....	56	45	44	27	44	26	50	39	73	51
South Atlantic.....	79	72	57	74	63	52	69	60	61	63
East South Central.....	63	45	50	52	57	65	57	45	38	91
West South Central.....	62	53	52	85	59	57	59	36	83	50
Mountain.....	44	70	44	123	44	53	61	53	96	53
Pacific.....	38	35	14	40	53	40	29	45	19	27

1 Terre Haute, Ind., not included.
 2 St. Paul, Minn., and Fort Smith, Ark., not included.
 3 St. Paul, Minn., not included.
 4 Fort Smith, Ark., not included.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Week ended August 29, 1931.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the week ended August 29, 1931, as follows:

Province	Cerebro-spinal fever	Dysentery	Influenza	Poliomyelitis	Small-pox	Typhoid fever
Prince Edward Island ¹						
Nova Scotia.....						1
New Brunswick.....				1		3
Quebec.....				50		21
Ontario.....	2			11		42
Manitoba.....						2
Saskatchewan.....		50	3		8	2
Alberta.....				1		3
British Columbia.....	1			5		1
Total	3	50	3	68	8	75

¹ No case of any disease included in the table was reported during the week.

Quebec Province—Communicable diseases—Week ended August 29, 1931.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended August 29, 1931, as follows:

Disease	Cases	Disease	Cases
Chicken pox.....	3	Poliomyelitis.....	50
Diphtheria.....	25	Scarlet fever.....	26
Erysipelas.....	3	Tuberculosis.....	38
Measles.....	6	Typhoid fever.....	21
Mumps.....	1	Whooping cough.....	30

CUBA

Provinces—Communicable diseases—Four weeks ended August 1, 1931.—During the four weeks ended August 1, 1931, cases of certain communicable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer.....					1	4	5
Chicken pox.....		2				29	31
Diphtheria.....	1	6	1	6	3	2	19
Malaria.....		9		1	5		60
Measles.....		59	3	22			84
Paratyphoid fever.....	1	2	3			1	9
Scarlet fever.....		1		2			3
Tetanus (infantile).....				3			3
Typhoid fever.....	1	54	10	32	1	26	124

LATVIA

Communicable diseases—January–June, 1931.—During the six months from January 1 to June 30, 1931, cases of certain communicable diseases were reported in Latvia as follows:

Disease	Month						Total
	January	February	March	April	May	June	
Botulism			1				1
Cerebrospinal meningitis	6	6	5	8	6	3	34
Diphtheria	67	78	69	57	92	44	407
Erysipelas	65	47	40	44	45	28	269
Influenza	1,450	823	390	110	123	26	2,931
Leprosy		3				2	5
Lethargic encephalitis				1	1		2
Malaria		1	1				2
Measles	78	103	150	69	69	39	508
Mumps	43	113	96	80	163	47	542
Poliomyelitis		1					1
Puerperal fever	17	12	16		13	8	81
Scarlet fever	147	120	100	64	84	28	545
Tetanus	1	1	1		1		5
Trachoma	112	112	135	94	81	96	630
Typhoid fever	68	44	42	52	56	61	318
Whooping cough	51	49	45	102	58	83	388

MEXICO

Tampico—Communicable diseases—August, 1931.—During the month of August, 1931, certain communicable diseases were reported in Tampico, Mexico, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	4		Measles		1
Dysentery	8	2	Paratyphoid fever	2	1
Enteritis (various)	40		Tuberculosis	34	23
Influenza	8	2	Typhoid fever	5	1
Malaria	135	8	Whooping cough	20	

TRINIDAD

Port of Spain—Vital statistics—July, 1930, 1931.—The following statistics for the month of July, 1930 and 1931, are taken from a report issued by the public health department of Port of Spain, Trinidad:

	1930	1931		1930	1931
Number of births	147	153	Deaths under 1 year	14	32
Birth rate per 1,000 population	25.7	26.2	Deaths under 1 year per 1,000 births	95.2	200.2
Number of deaths	80	130			
Death rate per 1,000 population	14.0	22.3			

Negros, Occidental.....																		
Pampanga.....																		
Siam.....	10	14	1	3	2													
Ayudhya District.....	2	4	6	1	1													
Bangkok.....	1																	
Bismulok Province.....	3	3	8	1	1													
On vessel:	2	1																
S. S. Arankola at Rangoon from Calcutta.....			1															
S. S. City of Eastborne, at Calcutta from Co-																		
gnada.....																		
S. S. Talrea, at Penang from Calcutta.....																		
S. S. Bandar Shalpour, at Bushire, Persia, from																		
Basra.....																		
S. S. Kohistan, at Basra from Bushire, Persia.....																		
S. S. Cathay at Kobe, Japan, from Shanghai.....																		

1 From May 3 to 25, 1931, 162 cases of cholera with 76 deaths were reported in Rafsanjan and vicinity, Karman district, Persia.

2 Figures for cholera in the Philippine Islands are subject to correction.

Place	Febru- ary 1931	March, 1931	April, 1931	May, 1931			June, 1931			July, 1931			Aug. 1-10, 1931
				1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	
Indo-China (French) (see also table above):													
Cambodia ¹	125	79	58										12
Cochin-China ¹	29	106	62	1	44	40			83	96		72	87
					53	75			71	69		66	47

¹ Reports incomplete.

Dakahlia.....	3	10	3								1									
Delrout.....	1	4	1												2					
Gharbieh.....				1																
Girga.....	86	7								1										
Kena.....	24	22																		
Mandlut.....	5	3																		
Mandlut.....	17	1																		
Minieh.....	3																			
Minieh.....	8	6	3								10									
Port Said.....	2	3	1								2									
Port Said.....		1		1							1									
Port Said.....				1							1									
Tanis.....																				
Tanis.....																				
Hawai Territory.....																				
Hawai—Haukrus—Plague-infected rats.....																				
Maui Island—Kula District.....																				
India.....																				
Bassein.....	9,139	762	39	24	9	16	30	29	78	84										
Bassein.....	7,037	692	25	14	2	10	15	13	42	68										
Bombay.....	1	1																		
Bombay.....	4	11	8																	
Bombay.....	3	11	6																	
Burma.....	70	137	94	10	10	7	11	16	9	6										
Burma.....																				
Burma.....																				
Calcutta.....	2																			
Calcutta.....	2																			
Calcutta.....	23	3	2		1	5	1	2	8	10										
Madras Presidency.....	21	2	1		1				1	7										
Moulmein.....																				
Moulmein.....																				
Moulmein.....																				
Rangoon.....	1	1	2																	
Rangoon.....	1	1	2																	
Rangoon.....	17	4	7																	
Rangoon.....																				
Indo-China (see also table below): Phnompenh.....																				
Indo-China (see also table below): Phnompenh.....																				
Indo-China (see also table below): Phnompenh.....																				
Indo-China (see also table below): Phnompenh.....																				
Iraq:																				
Baghdad.....	6	4																		
Baghdad.....																				
Baghdad.....	8	23	10	6	1	6	1	1	1	1										
Baghdad.....	6	8	9	1	4	1	3	1	1	1										
Maadhan.....																				
Madagascar (see also table below): Tamatave.....																				
Madagascar (see also table below): Tamatave.....																				
Nigeria: Lagos.....																				
Nigeria: Lagos.....																				
Nigeria: Lagos.....																				
Plague-infected rats.....																				
Peru (see table below).....																				
Peru (see table below).....																				
Senegal (see table below).....																				

1 On July 27, 1931, 4,250 cases of plague were reported in Chiohe and Changchow, China, since April.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C, indicates cases; D, deaths; P, present]

Place	Week ended—																								
	Mar., 1931			Apr., 1931			May, 1931			June, 1931			July, 1931			August, 1931			September, 1931						
	Mar., 1931	Apr., 1931	May, 1931	Mar., 1931	Apr., 1931	May, 1931	Mar., 1931	Apr., 1931	May, 1931	Mar., 1931	Apr., 1931	May, 1931	Mar., 1931	Apr., 1931	May, 1931	Mar., 1931	Apr., 1931	May, 1931	Mar., 1931	Apr., 1931	May, 1931	Mar., 1931	Apr., 1931	May, 1931	
Siam.....																									
Bangkok.....																									
Nagasa Rajima.....																									
Spain: Hospitalet—Barcelona Province.....																									
Syria: Beirut.....																									
Tunisia: Tunis.....																									
Union of South Africa:																									
Cape Province.....																									
Orange Free State.....																									
Place	Mar., 1931	Apr., 1931	May, 1931	June, 1931	July, 1931	Aug., 1931	Place						Mar., 1931	Apr., 1931	May, 1931	June, 1931	July, 1931	Aug., 1931							
British East Africa (see also table above):																									
Kenya.....	7	845	245	154	464		Peru.....					8	8	2	5	5	2								
Indo-China (see also table above):	4	11	2	2	1		Senegal:					2	1	4	1	4	27	101							
Ambassira Province.....	70	30	19	15			Baol ¹																		
Antisabre Province.....	86	23	18	15			Dakar ¹																		
Miarinarivo Province.....	83	48	7	8			Louga ¹																		
Moramanga Province.....	10	6	2	2			Rufisque ¹																		
Tananarive Province.....	1	1	2	2			Tlives ¹																		
	90	41	18	2			Tivouane ¹																		
	81	40	18	1																					

¹ Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place	Feb. 6- Mar. 7, 1931	Mar. 8- Apr. 4, 1931	Apr. 5- May 2, 1931	May 3-30, 1931	Week ended—																				
					June, 1931			July, 1931			August, 1931			Sept. 6, 1931											
					6	13	20	27	4	11	18	25	1		8	15	22	29							
Algeria:																									
Algiers.....	1	2	2	1																					
Constantine.....		1	1	1																					
Arabia: Aden.....	1																								
Belgian Congo.....	1			47																					
Belgium.....																									
Bolivia.....																									
Brazil: Porto Alegre (alastrim).....	7	49	53	19																					
British East Africa: Tanganyika.....	91	1		13																					
D.....	13	3																							
British South Africa:																									
Northern Rhodesia.....																									
Southern Rhodesia.....																									
Canada:																									
Alberta.....	1																								
British Columbia.....	8																								
Manitoba.....	1			4																					
Winnipeg.....																									
Nova Scotia.....	1																								
Ontario.....	20	9	17	25																					
Kingston.....			5																						
North Bay.....	1																								
Ottawa.....	1																								
Sault Ste. Marie.....	2		4	1																					
Toronto.....																									
Quebec.....																									
Saskatchewan.....	63	58	46	48																					
Regina.....	1			2																					
Canary Islands: Las Palmas.....																									
Chile:																									
Antofagasta.....																									
Chanaral.....																									

1 An epidemic of smallpox was reported on May 18 with 716 cases and 314 deaths since the middle of April, 1931, in Mender Provinces, Bolivia.

British Cameroons: Mamfé.....	O																			
Colombia—Magdalena Province—Near Clanaga.....	O																			
Gold Coast:	O																			
Akuse.....	O																			
Dagomba District.....	O																			
Kintampo.....	O																			
Tamale.....	O																			
Wale Wale.....	O																			
Ivory Coast:	O																			
Bobo Dioulasso.....	O																			
Grand Bassam.....	O																			
Kong Circle.....	O																			
Seguela.....	O																			
Nigeria: Abakaliki.....	O																			
Senegal: Foder (Hinterland).....	O																			
Sudan (French):	O																			
Upper Volta:	O																			
Baufora.....	O																			
Ousagadougou.....	O																			

X