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## QUAIL AS A POSSIBLE SOURCE OF TULARAEMIA INFECTION IN MAN

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The question whether tularaemia occurs as a natural infection of game birds has been the subject of recent scientific investigation and has been widely discussed in various publications relating to wild animal life.

The possibility that *Bacterium tularense* might be an etiological factor in epidemics that periodically decimate native species of local game birds in western Montana was suggested to the writer several years ago by data secured in connection with field studies of Rocky Mountain spotted fever, which were being made from the field station of the United States Public Health Service at Hamilton, Mont., in the Bitterroot Valley. If tularaemia were so concerned, the matter appeared to be one of some importance—first, because of the resultant danger of human infection, and, second, as a possible factor in game-bird abundance. The latter point, of course, is one of considerable interest to sportsmen. Because of the first possibility, however, the Public Health Service since 1926 has been cooperating with the Bureau of the Biological Survey, and since 1927 with Dr. R. G. Green, of the University of Minnesota Medical School, in an investigation to determine whether there is actually a game-bird tularaemia complex in nature. The work, in so far as the Public Health Service has been directly concerned, has been carried on at Hamilton.

The general results of the Hamilton studies are too indefinite to justify consideration at this time, and in this paper it is intended to present only data of a recent test which resulted in the death of five quail (*Colinus virginianus*—bobwhite) that ingested feed contaminated with tularaemia-infected tissue. This finding of itself was of no great interest, and has become of apparent practical significance only because of the still more recent recovery of *Bacterium tularense* by Doctor Green from a quail found dead in nature. This finding of Doctor Green's is the first definite evidence thus far secured that any species of game bird may become naturally infected and the

most important observation thus far made in connection with the problem in hand. His data are to be reported shortly.

In the test concerned five quail were used. On February 7, 9, and 11, 1929, they were fed grain which had been moistened with a salt solution emulsion of spleen and liver of guinea pigs dead of tularaemia. Two died on the 13th and three on the 15th, respectively six and eight days after the first feeding of infected tissue. The lungs of two were deep red in color; the livers of two others showed scattered but definite small necrotic foci; while in the fifth no macroscopic pathology was noted. From each dead quail a pooled emulsion was prepared with pieces of heart, liver, and kidney, and a small quantity was injected into two guinea pigs, one intraperitoneally, the other subcutaneously. Of the 10 guinea pigs thus injected, 7 died the second day, 1 the third, and 2 the fourth, all with lesions typical of tularaemia. A culture isolated from the liver of one of these guinea pigs was agglutinated by immune serum from a person recovered from tularaemia.

The above test was made for two reasons—(1) because quail as a possible source of human infection has been suggested by the histories of two cases which occurred in the South; and (2) because quail are frequent hosts of the rabbit tick, *Haemaphysalis leporis-palustris* Packard, which occurs widely as a common parasite of at least several species of game birds (and of other ground-frequenting birds as well) and which both field and experimental data have indicated as a potentially important agent of tularaemia transmission in nature. Of the two cases noted, one (Mrs. W.), a patient of Dr. L. G. Gage, of Charlotte, N. C., while cleaning some quail, December 19, 1921, "stuck the sharp point of a wing bone into the middle finger of her left hand; after which she turned to a pan full of rabbits and manipulated them." This case has been reported by Francis.<sup>1</sup> The second case was treated by Dr. W. C. Colbert, Memphis, Tenn. His patient (Mrs. Y.), on February 28, 1927, dressed a quail and a woodcock which had been shot by her husband, but denied having handled a rabbit which was secured on the same trip. Although these histories do not point definitely to quail as the source of infection, nevertheless the possibility of quail-caused infection exists, and the increasing knowledge of the ramifications of tularaemia in nature is sufficient justification for holding in suspicion wild animals with which man comes more or less frequently in contact.

The test above reported, together with the observation of Doctor Green and the above case histories, warrant the suggestion that quail should be considered at least potential agents of human infection with tularaemia.

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<sup>1</sup> Jour. Amer. Med. Assoc., vol. 84, pp. 1243-1250, Apr. 25, 1925.

## DEVELOPMENT OF A POWER DUSTING DEVICE FOR APPLYING PARIS GREEN AS AN ANOPHELINE LARVICIDE

By J. A. LEPRINCE, *Senior Sanitary Engineer*, and H. A. JOHNSON, *Technical Assistant in Sanitary Engineering, United States Public Health Service*

The value of diluted Paris green dust as an anopheline larvicide has been known since 1921. In that year Dr. M. A. Barber, director of the malaria research laboratory of the United States Public Health Service, discovered the high toxicity of this poison for *Anopheles* larvæ and established the practicability of hand dusting with diluted Paris green as a valuable method of *Anopheles* control.

Since the discovery of this toxicity for *Anopheles* larvæ, the use of Paris green has spread to practically all of the malarious regions of the globe. It is especially valuable where dense vegetation is present or the water is covered by débris and under conditions where no other method of *Anopheles* control is feasible. When Paris green is applied by hand, it is mixed with some inert dust in the ratio of 1 to 100 and broadcast over the water.

During 1922, 1923, and 1924 W. V. King and G. H. Bradley, of the Bureau of Entomology, Department of Agriculture, carried on successful experiments with Paris green distributed from airplanes near Mound, La., and demonstrated the effectiveness of the method against *Anopheles* larvæ. In 1926 and 1927 Surg. L. L. Williams, jr., of the Public Health Service, working with Lieut. Commander (M. C.) S. S. Cook, of the United States Navy, at the Marine Barracks at Quantico, Va.,<sup>1</sup> obtained excellent results in dusting Paris green from airplanes. At Quantico it was found that 33 per cent Paris green in powdered soapstone or hydrated lime gave most satisfactory killing of *Anopheles* larvæ in the dense growths of Quantico Bay and Chopawamsic Swamp if wind velocity was not over 20 miles per hour and if the plane was 100 feet or less above the water.

There has developed a distinct need for a mechanical dusting device to make possible the economic control of *Anopheles'* breeding areas too large for hand dusting and yet too small for the economical use of an airplane. Such a device would properly be applicable to areas of approximately 1 to 100 acres. It should be mobile, inexpensive, and, if possible, so arranged as to be operated by one man. It could be used to advantage on the upper reaches of impounded waters, on overgrown swampy areas, small vegetation covered lakes, fishing ponds, mill ponds, and even large bayous. In view of this need, the writers, during the season of 1928, attempted the development of a

<sup>1</sup> See Public Health Reports, vol. 42, No. 7, pp. 459-480, No. 38, pp. 2337-2338 (Reprints Nos. 1140 and 1180), and Sou. Med. Jour., September, 1928, pp. 754-760.

device that could be used in a satisfactory way by health authorities as their malaria problems might suggest.

The first trial was made with a boat operated by an air propeller and therefore possible of operation on vegetation covered water. A hydroglider was procured and tests were made of its ability to blow Paris green dust by taking advantage of its air propeller. While it was found possible to use this device for a blower and to dust successfully, it was observed that the most satisfactory dust clouds were made with a very low engine speed. This fact, of course, put a tremendous overhead in the way of first cost and unnecessary expense of operation on this boat as a duster.

After numerous attempts to make the use of this hydroglider more practicable, the idea was abandoned in favor of a smaller and less costly equipment which it was believed would do the work required in a more efficient manner.

#### EQUIPMENT USED

In view of the nature of the *Anopheles*' breeding places to be controlled with the device, it was thought best to select portable units of light weight and to use them in a light skiff-type of boat. After investigating the merits of the engines, blowers, etc., available on the market, the following equipment was procured:

1 skiff type rowboat, 14 feet by 52 inches.....	\$70. 00
1 outboard motor.....	140. 00
1 portable gasoline-driven electric generator unit, 110 volts, weight 108 pounds.....	225. 00
1 centrifugal fan-type electric blower, 110 volts, weight 8 pounds, with inlet flange and 1¼-inch suction hose.....	50. 00
1 hopper, for dust delivery.....	12. 50
	<hr/>
	497. 50

The generator unit consists of a 1-cylinder gasoline engine driving a 110-volt electric generator. The two are combined into a single unit weighing 108 pounds and developing 600 watts (0.80 horsepower). This unit is set on spring legs to reduce vibration, does not require bolting down, is entirely automatic in operation, and is easily moved from boat to boat.

The blower is a 110-volt electrically driven unit, weighing about 8 pounds, requiring 0.16 horsepower, and is connected with the generator by a flexible wire cable such as is used with a vacuum cleaner. It is held in the hand or can be fastened to the boat's side and can be operated from any position and at any angle desired. The blower has a theoretical nozzle velocity of about 15,000 feet per minute and moves 45 cubic feet of dust-laden air per minute.

## DEVELOPMENT OF A FEEDING HOPPER

In the earlier tests the dust was fed into the blower by dipping the suction hose into the dust and withdrawing it. It was observed that the cutting off of the intake air supply of necessity cut down the high velocity of the discharge nozzle. A hopper was then devised whereby

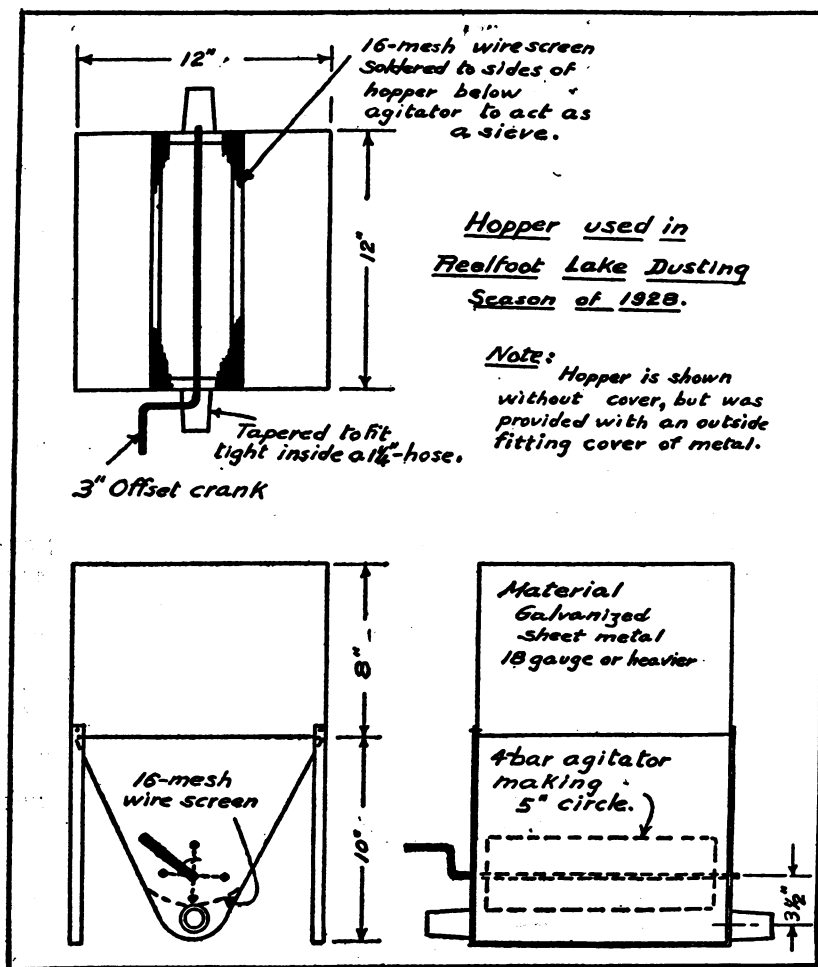


FIGURE 1.—Details of hopper

the intake air was drawn through the bottom of the hopper unrestricted and the dust sifted into the stream by an agitator similar in plan to the well-known flour sifter. In this way complete control of the dust was had without throttling the ingoing air supply. This hopper was approximately 12 by 12 inches, by 18 inches in height, with a tapered bottom. It was made by a local tinsmith at a cost of \$12.50.

## AREA SELECTED

Reelfoot Lake in northwestern Tennessee was selected as a place to work out the details of the dusting equipment. This lake is of earthquake formation with thousands of submerged stumps, the result of a decaying forest. It has large areas of shallow and densely overgrown water, and there are many types of moss, duckweed, lilies, *Myriophyllum*, and other plants. The lake seemed to offer the most difficult conditions under which to operate. Parts of the lake were known to be producing *Anopheles* profusely.

Another determining factor in the selection of Reelfoot Lake was that, at that time, experienced personnel from the Tennessee State Department of Health were present in Tiptonville, near by, making a study of the mosquito life of west Tennessee and of the associated malaria problem.

## PREPARATION FOR EXPERIMENTAL WORK

It was impossible to commence work at Reelfoot Lake before July 1, 1928. During June, however, experiments with hand dusters on dry land had been of material assistance, indicating that a much richer dust than 1 per cent Paris green must be used if the poison was to be made effective over considerable distances. This fact is also apparent when it is remembered that, with dust spreading approximately in the form of a cone, the density of coverage at any point varies inversely as the square of the distance from the point of liberation.

In order accurately to plot the results of dusting tests and to study the economic costs of dusting, it was necessary, at Reelfoot, to select a number of *Anopheles*' breeding areas, stake them out into 50-foot or 100-foot squares, and cut paths through the water vegetation to enable the boat to be operated under its own power. The three areas thus staked and referred to in the tests were as follows:

"*Main Street area*."—This area, on the east side of the lake, comprised a large open bight of approximately 15 acres in extent and densely overgrown with lotus and saw grass. *Anopheles* breed moderately throughout the area.

"*Quadrifaculatus Park*."—This section included an extensive area 2 miles west of the town of Samburg. The vegetation in this area was a tangled mass of moss, duckweed, *Lemna*, and water-star grass. The surface resembled a well-kept lawn, and it was impossible to operate a motor in this water. A peninsula of this vegetation proved to be a heavy producer of *Anopheles quadrifaculatus* and could be dusted from open water without the necessity of pushing the boat through the aquatic vegetation with poles.

"Red's area."—This area comprised a belt of lilies 100 feet wide along the west shore of the lake. *Anopheles* production was moderate among the lilies.

Paths were cut only to facilitate repeated experiments. For practical control operations it was not necessary to cut paths through the water grass.

#### TESTS AS CARRIED OUT

In order to determine the effectiveness and ascertain the distance of satisfactory killing power of the dust, the following routine procedure was carried out:

First, a check of the density of *Anopheles* larvæ in the area to be dusted was made by dipping for approximately an hour, the number of positive and negative dips being recorded.

Second, floating wooden cages 6 inches square made of 1 by 3 inch material, with a bottom of wire screen or cloth, were loaded with known numbers of *Anopheles* larvæ and fastened at predetermined distances from the path of dust liberation.

Third, in dusting, measured quantities of dust of a known Paris green content were liberated uniformly over a given length of a straight path, and the wind carried the dust cloud over the area.

Fourth, after suitable time intervals the dusted area was again checked precisely as before dusting. The mortality in the cages was noted.

Some variations from the above-outlined procedure were made as seemed desirable, but these are commented on at another place in this report.

#### INCREASING THE ALTITUDE OF THE DUST CLOUD

It was assumed that the higher the elevation at which the dust cloud was liberated, the longer the distance it would travel. A light, 3-inch galvanized sheet-iron pipe 10 feet long was held approximately in a vertical position and the blower nozzle applied at its lower end. The dust-laden air traveled freely through this pipe and liberated the dust at an elevation of 10 feet above the water surface. The dust cloud thus liberated traveled much farther than a cloud liberated from the nozzle, but, of course, less dust was liberated close to the boat, except when the top of the pipe was so raised and lowered as to liberate dust at different elevations.

#### MOSQUITO BREEDING IN REELFOOT LAKE

The northwestern corner of Tennessee and the Reelfoot Lake vicinity is of flat alluvial soil, the result of Mississippi River overflow. The summers are hot and the winters severe, cold weather

remaining longer in the spring than is the case in the south coastal States. Cotton is the main crop, and the plantation system of farming is practiced.

Malaria throughout the West Tennessee bottoms is a public health problem of importance and *Anopheles*, mainly *A. quadrimaculatus*, are very prevalent in the warm season.

In Reelfoot Lake very little anopheline breeding was found before July 10. *Anopheles* breeding continued until late September, when a definite decline was noted. Late in August a heavy rain and wind, combined with unusually cool weather, caused a decided decrease in *Anopheles* larvæ, but this scarcity lasted only one week.

Many catches of larvæ of both *Anopheles* and non-*Anopheles* were made from time to time and were identified by the entomologist of the Tennessee State Department of Health, stationed at Tiptonville. *A. quadrimaculatus* and *C. inhibitor* were the only species identified from the lake proper.

#### DISCUSSION OF TESTS

A close study of the test notes and the accompanying diagrams shows the main features observed so far in the operation of the device.

Hydrated lime was the principal diluent used. This material was available, it was cheap and comparatively light, and it was thought that it should prove a good vehicle for carrying the Paris green over considerable distances allowing it to deposit uniformly.

The following results of comparative tests were noted:

In tests Nos. 1, 2, 3, 4, and 15, in which measured dust quantities were used, the effective area was surprisingly large. It will be noted that the Paris green used per acre was between one-half and three-fourths of a pound. With this dosage practically 100 per cent destruction of *Anopheles* larvæ in the area was obtained. In almost every instance the dust was wind-conveyed beyond the breeding area, but the total effective area covered by the dust cloud could not be determined.

In all of the tests carried out the effective area covered was considered to be that area within which, to all intents and purposes, 100 per cent destruction of *Anopheles* larvæ was obtained. This destruction was noted as far as 450 feet from point of liberation. The killing distance may be greater; we made no test where breeding extended more than 525 feet from the point of dust liberation.

#### COSTS

For the above-mentioned tests, hydrated lime was used with a Paris green which will be referred to as S. W. The cost of materials used, considering Paris green at 20 cents per pound and lime at 2 cents





Figure 2.—The complete dusting outfit as used in a boat. The gon-  
erator, hopper, and blower are clearly shown



Figure 3.—Inside construction of the hopper. The height and  
density of the vegetation in this area of successful dusting may  
be judged by this picture



Figure 4.—A successfully dusted are of dense water lily growth. Partly submerged stumps exist throughout this area, as well as in the section shown in the background



Figure 5.—This type of vegetation-covered water was effectively dusted from a boat moving along the path cut for the purpose (Main Street area)



Figure 6.—This area of water is covered with tangled growths of *Myriophyllum*, *Lemna*, and water star grass. Although the breeding of *Anopheles* was heavy in these areas, the growths offered no protection to the larvae against the dust cloud (*Quadrifasciatus* Park)

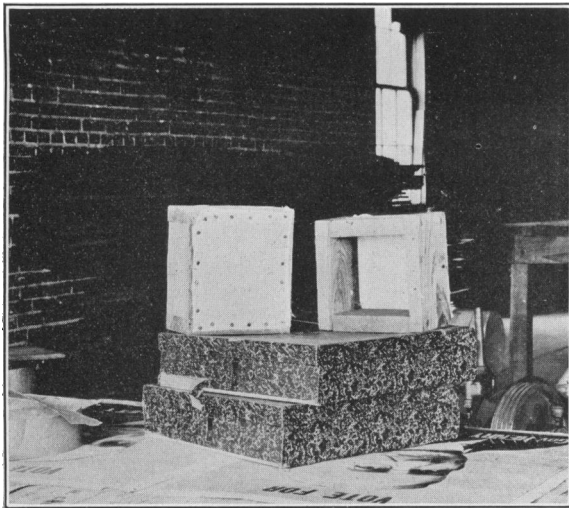


Figure 7.—Floating cages 6 inches square, as shown in this picture, were placed at known intervals in the areas being treated. The killing of *Anopheles* larvae placed in these cages gave additional information as to the effectiveness of dusting



Figure 8.—Liberating the dust cloud in a light breeze. The cloud can be seen almost at the edge of the picture



Figure 9.—The dust cloud being carried by the wind across the area treated

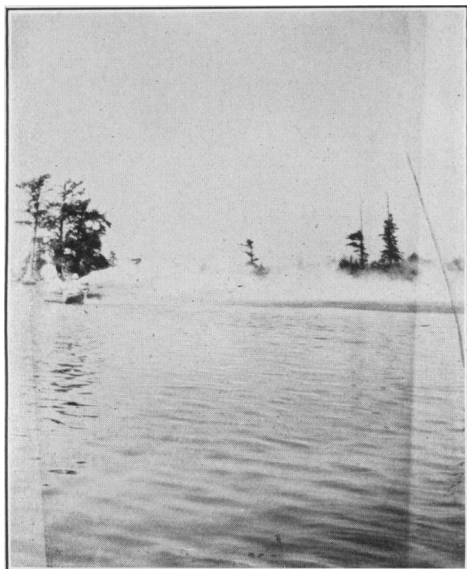


Figure 10.—This picture shows that the dust cloud covers considerable distance and also how it settles on the area being dusted

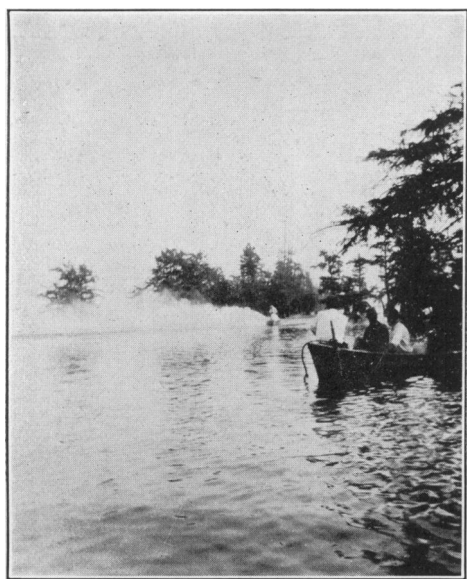


Figure 11.—An effective dust cloud. Note the uniformity in the density of the cloud as it travels outward from the boat

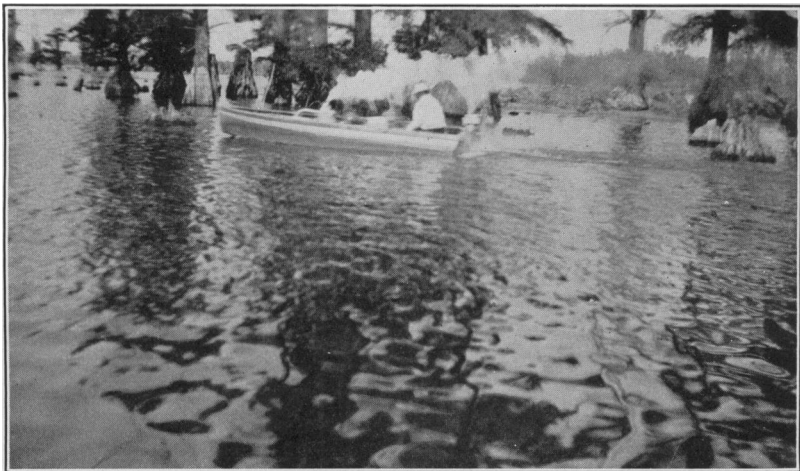


Figure 12.—Dusting a stump-infested lake with a power duster in a boat with an out-board motor. One man can operate the outfit



Figure 13.—Power duster in operation. Note the dust cloud extending to the extreme right of the picture, covering the mat of vegetation

per pound, ranged between 16 and 20 cents per acre. When, at whole-sale prices, Paris green can be obtained at 17 cents per pound and hydrated lime at \$13 per ton, the cost of materials per acre will be as follows:

One-half to three-fourths pound Paris green.....	8½ cents to..	13 cents.
3 pounds lime.....	2 cents .....	2 cents.
		Total cost per acre for materials..... 10½ cents to.. 15 cents.

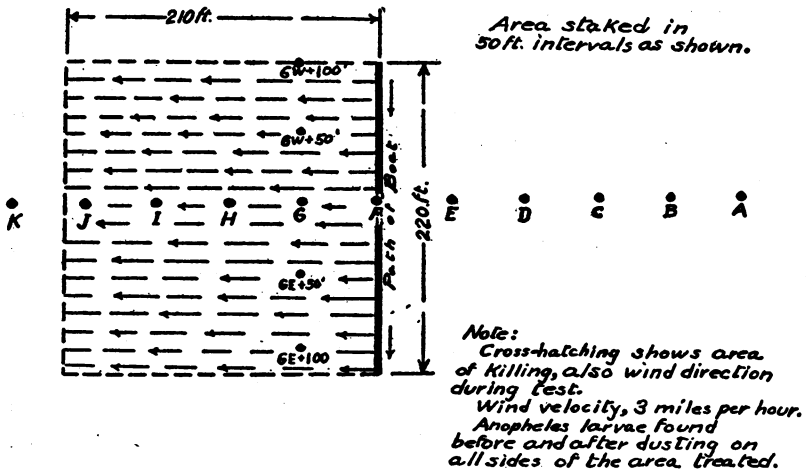
#### RECORD OF TESTS

All materials were mixed by hand before dusting.

#### *Reelfoot Lake Dusting*

##### Test No. 1

July 17, 1928.



#### *Test No. 1, Main Street Area, July 17, 1928*

Dust used: 1 pint S. W. Paris green mixed with 8 pints hydrated lime.

Time of dusting: 1 p. m.

Wind: 3 miles per hour, steady.

Speed of boat: 5 miles per hour.

Before dusting: As a result of a 2-hour search, *Anopheles* larvæ were found at every stopping position of the boat, averaging two to three per dip.

After dusting: A 3-hour check of the area starting two hours after dusting defined the path of effective destruction as shown on diagram of Test No. 1.

Cages: Within the area shown, 100 per cent mortality occurred among *Anopheles* larvæ placed in floating cages.

Conclusions: 11 per cent Paris green mixture by volume, with boat speed 5 miles per hour in 3-mile per hour wind, killed all *Anopheles* larvæ for a distance of 210 feet.

## Test No. 2, Main Street Area, August 3, 1928

Speed of boat: 5 miles per hour.

Dust used: Three-fourths pint S. W. Paris green mixed with 15 pints hydrated lime.

Time of dusting: 11 a. m.

Wind: Moderate light, probably 4 miles per hour.

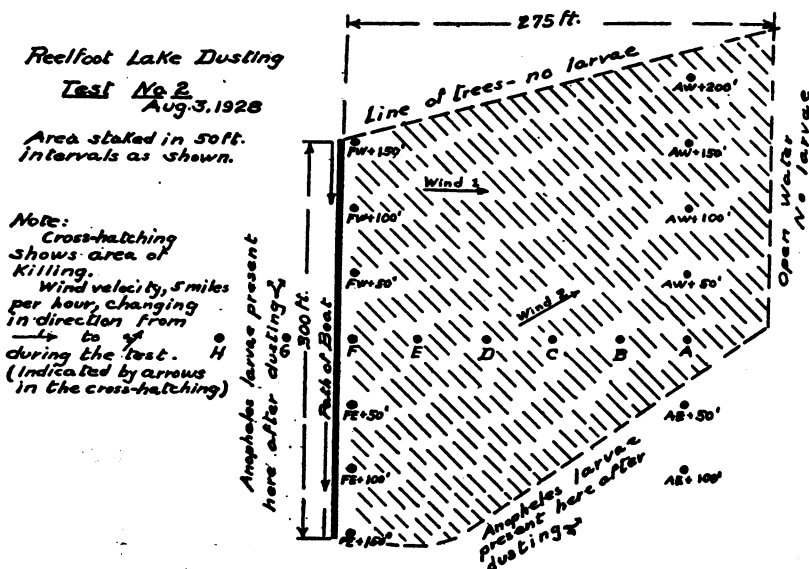
Before dusting: 510 dips over probable area to be dusted gave 51 positive dips.

After dusting: 3 hours after dusting 510 dips gave 1 positive 150 feet from line of dust liberation from boat (i. e., 1 live *Anopheles* larva in 510 dips).

Check area: Check area outside dusted area  $3\frac{1}{2}$  hours after dusting yielded 36 positive dips out of 91 dips.

Cages: Mortality in cages within the area shown was 100 per cent.

Conclusions: 5 per cent Paris green mixture by volume, with boat speed of 5 miles per hour in a 4-mile wind, killed all but 1 *Anopheles* larva for a distance of 275 feet.



## Test No. 3, Quadrimaculatus Park, August 14, 1928

Speed of boat: 5 miles per hour.

Dust used: One-half pint S. W. Paris green mixed with 10 pints hydrated lime.

Time of dusting: 12 noon.

Wind: Approximately 3 to 5 miles per hour.

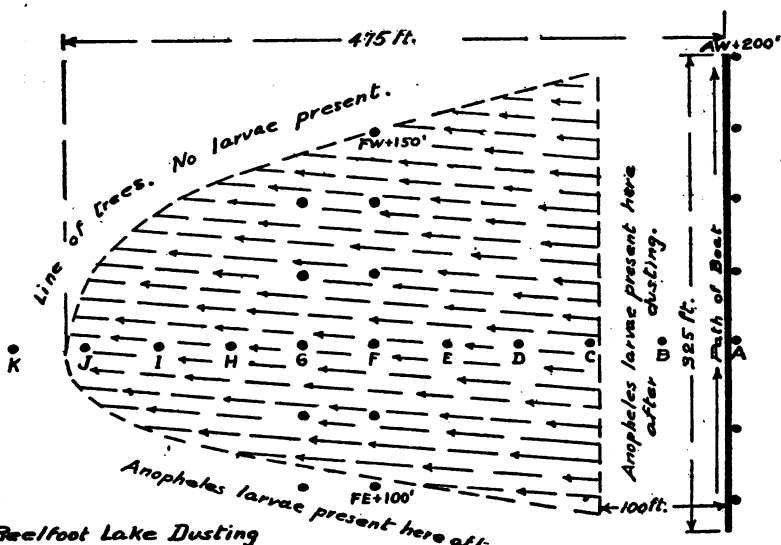
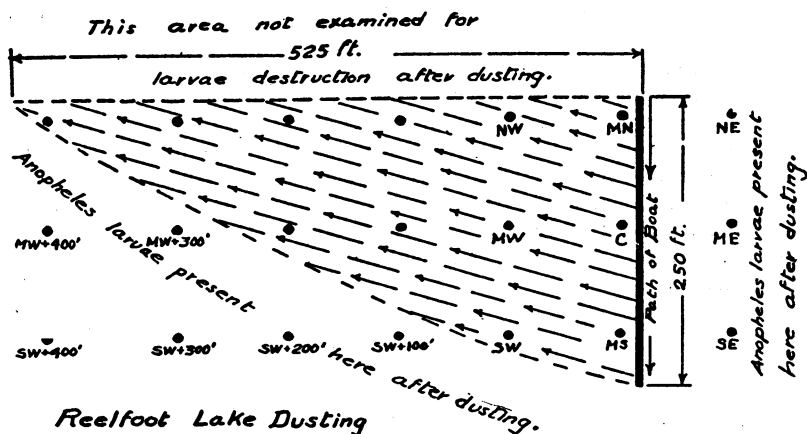
Before dusting: Before dusting *Anopheles* larvae caught from every position of the boat averaging 1 to 3 per dip.

After dusting: Two hours after dusting a thorough examination of the area lasting into the next day showed the path of effective destruction as given on diagram of test No. 3.

Cages: No cages used in this test.



Conclusions: 5 per cent Paris green mixture by volume with boat speed 5 miles per hour in 3 to 5 mile wind, killed all *Anopheles* larvæ for a distance of 525 feet.



Test No. 4, Main Street Area, August 15, 1928

Speed of boat: 5 miles per hour.

Dust used: 1 pint S. W. Paris green mixed with 10 pints hydrated lime.

Time of dusting: 4.15 p. m.

Wind: Stiff air currents, possibly 15 miles per hour.

Before dusting: *Anopheles* larvæ numerous all over area to be dusted, averaging three to a dip.

After dusting: 100 per cent destruction of larvæ in area shown on diagram of test No. 4. Note that a strip 100 feet wide close to boat was missed by dust, due probably to high wind and raised discharge nozzle.

Cages: Cages with *Anopheles* larvæ were placed throughout the area. The mortality in these was not as high as in the area itself.

Conclusions: 9 per cent Paris green mixture by volume, with boat speed of 5 miles per hour in 15-mile wind, killed all *Anopheles* larvæ for a distance of 475 feet, except for strip 100 feet wide close to boat. In these stronger winds the nozzle must be depressed in order to dust the area close to the boat.

Tests Nos. 5, 7, and 8 were not recorded because of interference by strong wind and wave action.

### Reelfoot Lake Dusting

Test No. 6  
Sept. 1, 1928.

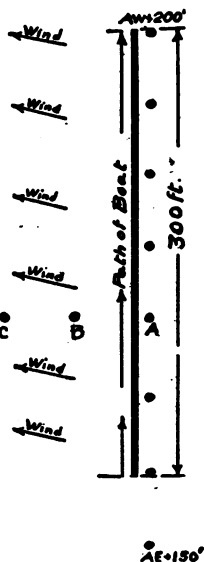
Area staked in 50 ft.  
Intervals as shown.

I H G F E D C B

Note:  
No definite area of  
killing resulted from  
this test.  
Wind direction (average)  
indicated by arrows and was  
"stiff and changeable."  
*Anopheles* larvæ  
numerous over the entire  
staked area.

NW-150'

SE-100'



### Test No. 6, Main Street Area, September 1, 1928

Dust used: One-half pint I. C. C. Paris green mixed with 10 pints hydrated lime.

Time of dusting: 12 noon.

Wind: Changeable and stiff breeze.

Before dusting: Simple check determined that larvæ were plentiful throughout the area.

After dusting: Inspection next day of the dusted area showed some dead larvæ, but it was not uncommon to find two live larvæ per dip anywhere in the area.

Cages: In only one of four cages was the mortality 100 per cent.

Conclusions: This dusting was not effective over any area due to lack of toxicity of I. C. C. Paris green.

*Test No. 9, Main Street Area, September 6, 1928*

Dust used: 10 pounds of dust containing 5 per cent by volume S. B. H. Paris green.

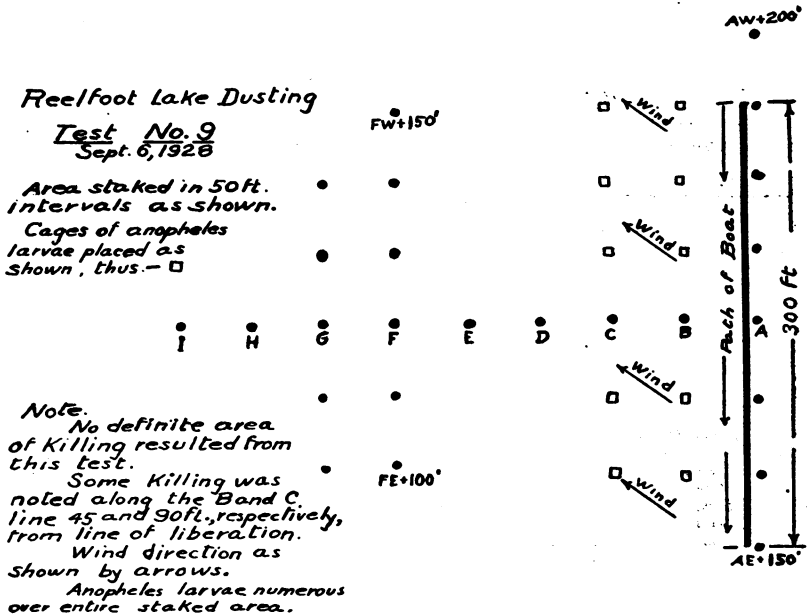
Time of dusting: 11.15 a. m.

Wind: 4 miles per hour, at 45° to path of liberation.

Cages: Two parallel rows placed at 45 feet and 90 feet, respectively, from path of dust liberation.

After dusting: Three hours after dusting approximately 50 per cent of larvæ in the 45-foot line of cages were dead. Slight mortality in the 90-foot line cages. Two small larvæ dipped in nature on 90-foot line 3½ hours after dusting.

Conclusions: There was no area of effective dusting in this experiment. S. B. H. Paris green has low toxicity.

*Test No. 10, Quadrimaculatus Park, September 7, 1928*

Speed of boat: 5 miles per hour.

Dust used: 1 pint S. W. Paris green mixed with 9 pints alberene dust.

Time dusted: 11.15 a. m.

Nozzle elevation: About 45° to water surface.

Wind: 1.7 miles per hour.

Before dusting: Cages placed 50 feet apart up to 500 feet in a line with the wind and at right angles to the path of the boat liberating the dust. *Anopheles* larvæ placed in each cage. Purpose of the test was to observe the distance from point of liberation of effective killing.

After dusting: Four hours after dusting, examination of cages and natural waters in the area dusted showed effective killing 160 feet from the point of liberation. Much of the dust settled on the water close to the boat.

Conclusions: 10 per cent Paris green in low wind with low nozzle elevation gives lethal path less than 200 feet wide. Alberene is too heavy a diluent.

*Test No. 11, near Quadrimaculatus Park, September 10, 1928*

Speed of boat: 5 to 6 miles per hour.

Nozzle elevation:  $45^{\circ}$  from horizontal.

Dusting: Line of cages placed 50 feet apart to study distance of effective killing. *Anopheles* larvæ in each cage.

Time of dusting: 11.20 a. m.

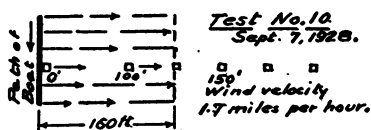
Wind: 4.6 miles per hour approximately parallel to cage line.

Path of dusting: Right angles to cage line.

Dust used: 1 pint S. W. Paris green mixed with 9 pints hydrated lime.

After dusting: 4 hours after dusting 100 per cent mortality was observed up to 260 feet from the path of dust liberation. Control cages placed outside dusted area showed no larval mortality.

Conclusions: 10 per cent Paris green by volume in light breeze gives lethal path 260 feet wide.

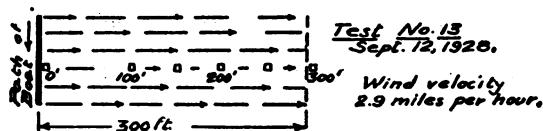
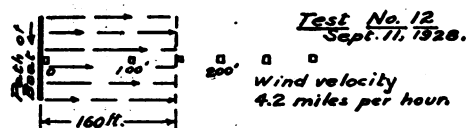
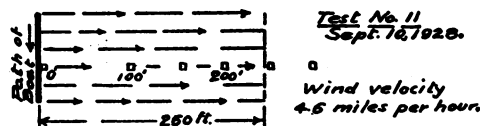
*Reelfoot Lake Dusting**Note.*

Tests 10 to 13, inclusive, were made to determine distance of killing from point of liberation of dust.

Cages of anopheline larvæ were used exclusively and were placed at 50 ft. intervals from path of boat as shown.

Path of boat was sufficient to insure that dust cloud reached all cages.

Average wind direction was in line with cages as shown by arrows.

*Test No. 12, near Quadrimaculatus Park, September 11, 1928*

Speed of boat: 5 miles per hour.

Elevation of nozzle:  $45^{\circ}$  from horizontal.

Dusting: Line of cages placed 50 feet apart to study distance of effective larval killing. *Anopheles* larvæ in each cage.

Time of dusting: 12.42 p. m.

Wind: 4.2 miles per hour parallel to cage line.

Path of dusting: Right angles to cage line.

Dust used: 1 pint S. W. Paris green mixed with 19 pints hydrated lime.

After dusting: 18 hours after dusting (next day) 100 per cent mortality only extended to 160 feet from point of liberation.

Control cage: Placed outside dusted area showed a 50 per cent mortality of the contained larvæ, cause of mortality not determined.

Conclusions: 5 per cent Paris green dust mixture by volume in moderate wind produced 160 feet lethal path.

*Test No. 13, near Quadrimaculatus Park, September 12, 1928*

Dusting: A line of cages placed 50 feet apart to study distance of effective larval killing. *Anopheles* larvæ in each cage.

Time of dusting: 11.30 a. m.

Wind: Parallel to cage line and 2.9 miles per hour.

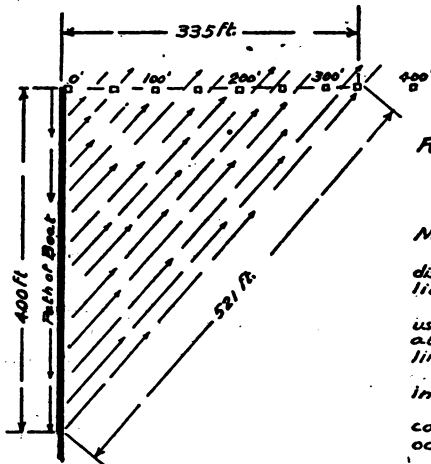
Path of dusting: At right angles to cage line.

Dust used: 5 per cent S. W. Paris green and hydrated lime.

After dusting: 18 hours after dusting (next day) 100 per cent mortality was observed up to 300 feet from the line of dusting.

Control cage: Placed outside dusted area showed no mortality.

Conclusions: At wind velocity of 2.9 miles per hour 5 per cent Paris green mixture gave a 300-foot lethal path.

*Reelfoot Lake Dusting**Test No. 14  
Sept. 13, 1928**Note:*

This test was made to determine distance of killing from point of liberation of dust.

Cages of *Anopheles* larvae were used exclusively. Cages were placed at 50 ft. intervals as shown in a line at 45 degrees to wind direction.

Wind velocity 3.4 miles per hour in direction shown by arrows.

Diagram includes cages in which complete destruction of larvae occurred.

No observations on larvae other than those in cages were made.

*Test No. 14, near Quadrimaculatus Park, September 13, 1928*

Dusting: Line of cages placed 50 feet apart to study distance of effective larval killing. *Anopheles* larvæ caught four days previously used in the cages.

Time of dusting: 3 p. m.

Speed of boat: 5 miles per hour.

Nozzle elevation: 45° from horizontal.

Wind: 3.4 miles per hour at 45° with line of cages.

Path of dusting: At right angles to cage line and 45° to wind.

Dust: 1 pint S. W. Paris green mixed with 9 pints hydrated lime.

After dusting: 15 hours after dusting (next day) all cages showed 100 per cent mortality of larvæ. This would indicate 100 per cent mortality at a distance of 521 feet from line of liberation of dust.

Test cages: 3 test cages (old and with visible signs of Paris green on them) were placed in a near-by nondusted area and after 15 hours approximately two-thirds of the larvæ in them were dead.

Conclusions: At wind velocity of 3.4 miles per hour a 10 per cent Paris green mixture gave a 521-foot lethal path.

## Test No. 15, Quadrimaculatus Park, September 21, 1928

(Demonstration test)

Dust used: 2 pints S. W. Paris green mixed with 11.3 pints hydrated lime.

Time of dusting: 12 noon.

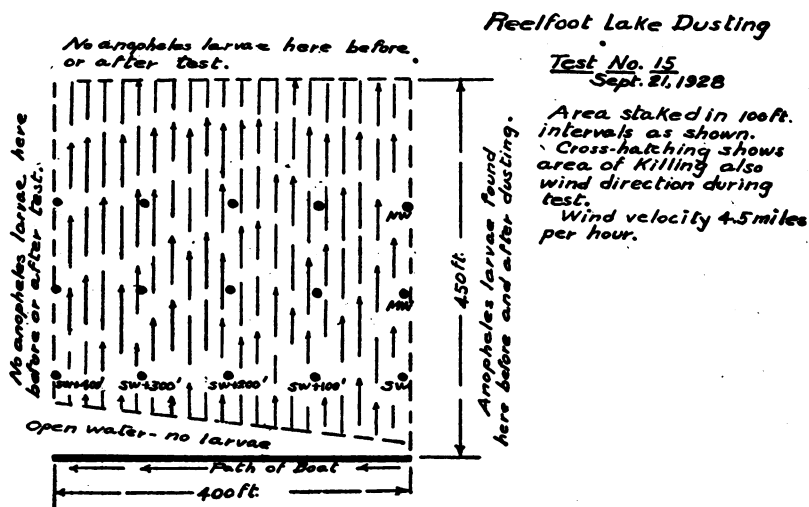
Speed of boat: 5 miles per hour.

Elevation of nozzle: 45° from horizontal.

Wind: 4.5 miles per hour.

Before dusting: 23 people dipping in the area to be dusted reported 70 per cent of their dips positive for *Anopheles* larvæ.After dusting: 1 hour after dusting 23 people dipped in the area for 1 hour, finding only 1 small live *Anopheles* larva but many dead ones in a total area of 3 acres dusted.

Conclusions: A 15 per cent Paris green mixture by volume gave a lethal path 450 feet wide. Two-thirds of a pound of Paris green per acre gave a larval mortality of 100 per cent in the 3-acre tract dusted.



## Summary of tests

Test No.	Area effectively covered (acres)	Cost of materials per acre	Greatest distance effective dusting	Time of dusting	Wind velocity (miles per hour)
1	1.0	\$0.196	210	1 p. m.	3.0
2	1.87	.175	275	11 a. m.	5.0
3	1.12	.193	525	12 m.	3.0
4	1.91	.153	475	4.15 p. m.	15.0
5					
6				12 m.	
7					
8					
9					
10				11.15 a. m.	4.0
11			160	11.15 a. m.	1.7
12			260	11.20 a. m.	4.6
13			160	12.42 a. m.	4.2
14			300	11.30 a. m.	2.9
15			521	3 p. m.	3.4
16	3.25	.170	450	11.45 a. m.	4.5

## STRENGTH OF PARIS GREEN USED

Paris green strengths ranging with the S. W. product from 5 to 15 per cent by volume were employed. Results which we considered very satisfactory were obtained in all instances when lime was used as a carrier with this Paris green. There is no doubt that a relation exists between the speed of the boat and distance of effectiveness of destruction of larvæ from the boat which may determine the most feasible percentage of Paris green to use. In all of our experiments the boat speed was between 5 and 6 miles per hour.

In test No. 6 a Paris green which we will refer to as I. C. C. Paris green was substituted, and while some killing of *Anopheles* occurred, there was no definite area in which the mixture was effective. It seems reasonable to conclude that this brand of Paris green is not highly toxic to *Anopheles* larvæ. Also, during the hydroglider tests this Paris green did not kill even where a green scum of dust covered the larvæ.

Test No. 9, made with 10 pounds of the S. B. H. mixture containing 5 per cent Paris green gave no definite effective area of *Anopheles* larvæ destruction. This brand of Paris green was only slightly toxic.

## DILUTING DUST

Aside from lime, only one other diluting dust was tried in combination with S. W. Paris green. This was alberene, or soapstone. Test No. 10 was made with this diluent, and the heavy settling of a large part of the mixture close to the path of delivery was disappointing. Although a very heavy volume of dust was liberated, the effective area did not extend over 160 feet from the boat.

It is quite probable that the greater specific gravity of alberene, while an advantage when used in airplane dusting, is not suitable where it is necessary to float the relatively heavy Paris green over an area and hold it in the air as long as possible. With our apparatus the dust is liberated quite close to the water, and quick settling is a disadvantage.

The following weights of materials used at Reelfoot Lake are given for purposes of comparison:

- 1 pint measure of lime  $\text{Ca(OH)}_2$  = 9 ounces.
- 1 pint measure of alberene = 13 ounces.
- 1 pint measure S. W. Paris green = 17 ounces.
- 1 pint measure I. C. C. Paris green = 22 ounces.

## EFFECTS OF WIND ON DISTANCES COVERED

It was our observation that gentle steady breezes were most satisfactory for dusting and that stiff or gusty winds tended to make the destruction of *Anopheles* larvæ distinctly "spotty" or as though

some parts of the water area had not been treated as well as others. In general, a wind velocity of 6 miles per hour or less was found to be the most satisfactory for dusting.

Tests Nos. 8, 11, 12, 13, and 14 were made to determine the distance that larvæ killing would occur with average wind velocities. Control cages were mainly relied upon to determine the results. Owing to wind shifts and other factors beyond our control, these tests do not give additional information.

It should be stated, however, that where larvæ cages were employed, the larvæ killing in the natural habitat occurred more distant from the point of dust liberation than the results in the cages would lead one to believe.

#### RESULTS

We believe the excellent results obtained with this duster are due, in a large measure, to the following factors:

1. Use of a highly toxic Paris green.
2. Use of hydrated lime as a diluent.
3. Passage of the dust through the impeller whereby it was thoroughly disintegrated, broken up, and mixed.
4. Extremely high discharge velocity of the blower, also insuring a well broken up dust.

#### SUMMARY

Although experimental work with this boat duster is not considered complete at this time and probably will be continued another season, it has shown itself to be especially adaptable to many phases of *Anopheles* larvæ destruction work. It can be economically used where no other known method of larval control is feasible. It is easily portable and can be depended upon to dust effectively up to at least 525 feet from the path of liberation.

The generator is sufficiently large to operate several blowers of the type described; and as these could be added without entailing additional operators, the entire device is sufficiently flexible to meet almost any condition of possible boat speed.

As already mentioned, this dusting unit consists of a power generator, an electric blower, and a small dust hopper. We found it practicable to load these items into an auto together with the out-board motor and a supply of mixed dust. On arrival at the pond to be treated, these items could be quickly transferred to and installed in the rowboat and made ready for dusting operations. The dusting activity and the guiding of boat were successfully accomplished by one man.

The work at Reelfoot Lake has brought out vividly a serious defect in the use of Paris green against *Anopheles* larvæ that has been reported many times. Paris green varies greatly in its larvicidal



power, and in the experiments two of the three kinds used were unsatisfactory. With the increasing use of this larvicide throughout the world, this is a matter of great importance and should be thoroughly investigated in order that Paris green may be purchased under specifications which will assure high toxicity against anopheline larvæ. In ordering Paris green as an anopheline larvicide, a sample should be secured before purchase, tested with larvæ, and its toxicity demonstrated.

#### CONCLUSIONS

1. A light, portable power blower has been developed.
2. The blower can be operated by one man.
3. The whole unit can be quickly set in a small boat.
4. Material costs are as low as 15 cents per acre per dusting.
5. Hydrated lime is the most satisfactory diluent tested for use with Paris green in the power blower.
6. Fifteen per cent Paris green mixture gives most uniform results.
7. Moderate breeze velocities, not over 7 or 8 miles per hour, are most satisfactory.
8. In breezes less than 2 miles per hour the nozzle should be well elevated.
9. In moderate breezes a 15 per cent Paris green mixture gives a lethal path at least 525 feet wide.
10. Toxicity for *Anopheles* larvæ should be tested for each lot of Paris green.

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#### COURT DECISIONS RELATING TO PUBLIC HEALTH

*Possession of narcotic drugs by physician.*—(Kansas Supreme Court; *State v. Miller*, 274 P. 245; decided February 9, 1929.) The defendant, a licensed physician, was convicted in the trial court of unlawful possession of morphine. On appeal one of the defendant's contentions was that the statute (Laws 1927, ch. 241) did not condemn mere possession of narcotics by a physician. After examining the pertinent provisions of the act, the supreme court declared as follows:

\* \* \* We think the following conclusions may fairly be deduced as to the legislative intent:

First. It shall be unlawful for any person to possess narcotics, except certain designated classes under certain named regulations.

Second. Certain designated classes may possess such drugs, but to do so they must comply with specific regulations, including the use of Federal forms.

Third. If these regulations are complied with, physicians, as one of the excepted classes, may lawfully possess narcotics.

Fourth. But the possession by a physician, even after he has complied with the regulations and used Federal forms, is not lawful unless for the purpose of use in the course of his practice.

The defendant also maintained that he did not have a fair opportunity to meet the charges on which he was convicted. Respecting this the court said:

The information charged the unlawful possession of opium derivatives. The defendant attempted to meet the charge by denying possession of the can and by showing that he was a licensed physician. The State made a prima facie case, and it then devolved upon the defendant to show some reason why he should come under an exception to the general prohibition because possession or control is presumptive evidence of a violation. Three conditions had to be met before his possession was lawful:

- (1) That the drug had been regularly obtained by the use of Federal forms.
- (2) That the defendant was a licensed physician.
- (3) That the morphine was owned for the purpose of use in defendant's medical practice.

The defendant attempted to prove only the second condition, and in that respect failed to rebut the presumption created by his possession. \* \* \*

The judgment of the lower court was affirmed.

*Municipalities held liable for nuisance caused by sewer and sewage-disposal plant.*—(New Jersey Court of Errors and Appeals; *Ennever et ux. v. Borough of Bergenfield et al.*, 144 A. 809; decided February 14, 1929.) An action was brought against certain municipal corporations to recover damages for injuries to plaintiffs' property, resulting from the construction and operation by the defendants of a joint sewage-disposal plant and a joint sewerage system. A jury found that the disposal by the municipalities of sewage into a small stream which flowed through plaintiffs' land created a nuisance, and returned a verdict for the plaintiffs. The court of errors and appeals affirmed the judgment of the lower court, basing the liability of the defendants on the fact that, although they "were performing a public duty in constructing and operating the sewers and the disposal plant," they "were committing an active wrong, thereby causing special damage to the plaintiffs' property."

## DEATHS FROM INFLUENZA AND PNEUMONIA IN LARGE CITIES

*Deaths from influenza and from pneumonia (all forms) in 78 large cities during 22 weeks, October 28, 1928, to March 30, 1929, with death rates per 100,000 population. (From the Weekly Health Index, April 18, 1929, issued by the Bureau of the Census, Department of Commerce)*

	Influenza		Pneumonia (all forms)	
	Number of deaths	Annual death rate per 100,000 population	Number of deaths	Annual death rate per 100,000 population
Total .....	10,755	77.3	30,897	222.0
Akron .....	57	( <sup>1</sup> )	292	( <sup>1</sup> )
Albany .....	50	116.1	201	305.7
Atlanta .....	247	229.5	354	236.0
Baltimore .....	273	77.9	1,014	286.4
Birmingham .....	351	374.1	247	263.2

<sup>1</sup> Mortality rates are omitted, pending the establishment of more satisfactory estimates of population.

*Deaths from influenza and from pneumonia (all forms) in 78 large cities during 23 weeks, October 28, 1928, to March 30, 1929, with death rates per 100,000 population—Continued*

	Influenza		Pneumonia (all forms)	
	Number of deaths	Annual death rate per 100,000 population	Number of deaths	Annual death rate per 100,000 population
Boston.....	122	36.2	996	295.4
Bridgeport.....	67	( <sup>1</sup> )	141	( <sup>1</sup> )
Buffalo.....	80	34.1	654	278.9
Cambridge.....	23	43.3	127	239.3
Camden.....	49	85.8	149	260.8
Canton.....	65	131.9	117	237.4
Chicago.....	533	40.0	2,235	167.8
Cincinnati.....	214	( <sup>1</sup> )	493	( <sup>1</sup> )
Cleveland.....	344	80.7	828	194.2
Columbus.....	197	156.2	225	178.4
Dallas.....	157	170.8	199	216.6
Dayton.....	36	46.2	135	173.4
Denver.....	278	224.0	336	270.7
Des Moines.....	61	95.2	111	173.2
Detroit.....	393	67.6	1,235	212.3
Duluth.....	41	83.2	45	91.3
El Paso.....	156	313.9	130	261.6
Erie.....	100	( <sup>1</sup> )	68	( <sup>1</sup> )
Fall River.....	58	102.4	101	178.2
Flint.....	69	109.9	161	256.4
Fort Worth.....	149	207.0	124	172.3
Grand Rapids.....	73	105.4	72	103.9
Houston.....	78	( <sup>1</sup> )	267	( <sup>1</sup> )
Indianapolis.....	106	65.8	479	297.1
Jersey City.....	77	56.2	374	273.0
Kansas City, Kans.....	58	116.2	153	306.5
Kansas City, Mo.....	127	77.0	390	236.4
Knoxville.....	95	213.6	151	339.6
Los Angeles.....	412	( <sup>1</sup> )	729	( <sup>1</sup> )
Louisville.....	52	37.4	434	312.3
Lowell.....	6	( <sup>1</sup> )	120	( <sup>1</sup> )
Lynn.....	18	40.4	84	188.7
Memphis.....	213	265.4	199	248.0
Milwaukee.....	141	61.4	394	171.6
Minneapolis.....	138	71.7	266	138.3
Nashville.....	145	246.2	143	242.8
New Bedford.....	13	( <sup>1</sup> )	150	( <sup>1</sup> )
New Haven.....	28	35.3	171	215.7
New Orleans.....	403	222.4	423	233.5
New York.....	1,063	42.7	6,145	242.0
Newark, N. J.....	93	46.5	419	209.7
Oakland.....	77	66.6	137	118.5
Oklahoma City.....	80	( <sup>1</sup> )	219	( <sup>1</sup> )
Omaha.....	0	0.0	296	314.9
Paterson.....	40	65.4	150	245.4
Philadelphia.....	496	57.0	1,965	225.6
Pittsburgh.....	675	237.4	1,090	383.4
Portland, Oreg.....	86	( <sup>1</sup> )	192	( <sup>1</sup> )
Providence.....	59	48.8	258	213.6
Richmond.....	107	130.5	143	174.3
Rochester.....	33	23.8	205	148.0
St. Louis.....	52	14.5	864	241.5
St. Paul.....	62	( <sup>1</sup> )	223	( <sup>1</sup> )
Salt Lake City.....	88	151.1	80	137.4
San Antonio.....	179	194.5	190	206.5
San Diego.....	78	154.4	87	172.3
San Francisco.....	130	52.6	280	113.4
Schenectady.....	41	104.2	69	175.3
Seattle.....	134	82.9	192	118.8
Somerville.....	9	20.8	92	212.3
Spokane.....	65	141.2	86	186.8
Springfield, Mass.....	13	20.6	145	229.4
Syracuse.....	44	52.3	202	240.2
Tacoma.....	31	66.5	51	109.4
Toledo.....	206	155.9	194	146.8
Trenton.....	41	69.9	142	242.1
Utica.....	35	79.6	142	323.0
Washington, D. C.....	121	52.0	460	197.5
Waterbury.....	14	( <sup>1</sup> )	66	( <sup>1</sup> )
Wilmington, Del.....	27	49.8	137	252.7
Worcester.....	10	12.0	75	90.0
Yonkers.....	18	35.2	125	244.2
Youngstown.....	166	225.9	159	216.3

<sup>1</sup> Mortality rates are omitted, pending the establishment of more satisfactory estimates of population.

*Deaths from influenza and pneumonia in 78 large cities during eight weeks ended March 30, 1929.<sup>1</sup> (From the Weekly Health Index, April 18, 1929, issued by the Bureau of the Census, Department of Commerce)*

## INFLUENZA DEATHS

City	Week ended—							
	Feb. 9, 1929	Feb. 16, 1929	Feb. 23, 1929	Mar. 2, 1929	Mar. 9, 1929	Mar. 16, 1929	Mar. 23, 1929	Mar. 30, 1929
Total.....	391	371	268	249	226	218	184	100
Akron.....	1	0	1	0	1	2	1	1
Albany.....	4	3	0	0	2	1	0	0
Atlanta.....	10	9	7	9	6	5	2	3
Baltimore.....	18	13	9	10	5	3	8	3
Birmingham.....	2	14	2	8	3	5	6	5
Boston.....	9	5	3	3	1	5	2	1
Bridgeport.....	6	3	3	0	0	1	0	0
Buffalo.....	6	4	0	1	4	0	1	2
Cambridge.....	4	1	1	0	2	2	1	0
Camden.....	0	2	1	4	1	1	3	1
Canton.....	1	1	1	1	1	0	1	0
Chicago.....	8	12	15	13	12	11	7	7
Cincinnati.....	7	9	5	4	4	4	7	3
Cleveland.....	7	8	6	4	5	4	3	5
Columbus.....	3	6	7	6	6	4	3	3
Dallas.....	4	9	9	3	5	2	6	0
Dayton.....	1	11	0	0	0	0	1	0
Denver.....	6	10	4	6	5	3	5	5
Des Moines.....	0	1	1	1	0	0	0	0
Detroit.....	8	10	9	11	11	9	6	3
Duluth.....	1	3	4	1	1	3	0	0
El Paso.....	9	15	5	5	3	4	2	1
Erie.....	6	6	1	1	4	1	2	1
Fall River.....	7	6	3	0	1	1	0	0
Flint.....	2	2	2	2	1	0	0	1
Fort Worth.....	4	3	3	3	4	6	3	2
Grand Rapids.....	0	1	0	1	0	0	0	0
Houston.....	2	2	0	4	0	1	2	1
Indianapolis.....	4	4	3	1	1	2	1	0
Jersey City.....	5	5	4	3	2	0	2	0
Kansas City, Kans.....	1	0	2	1	0	0	0	0
Kansas City, Mo.....	5	1	3	4	1	2	2	2
Knoxville.....	3	1	0	1	2	2	0	2
Los Angeles.....	5	3	7	5	1	3	7	2
Louisville.....	1	1	2	4	2	0	1	0
Lowell.....	0	1	0	0	0	0	1	0
Lynn.....	2	0	1	0	0	0	0	1
Memphis.....	10	6	5	5	2	6	2	2
Milwaukee.....	4	6	0	2	2	0	1	1
Minneapolis.....	7	1	2	2	2	2	2	0
Nashville.....	3	6	4	5	2	4	2	0
New Bedford.....	2	0	0	1	0	0	0	0
New Haven.....	3	5	1	0	0	1	0	0
New Orleans.....	10	15	19	5	12	7	6	3
New York.....	74	61	47	23	24	35	26	13
Newark, N. J.....	3	5	2	1	0	0	0	0
Oakland.....	0	2	1	1	5	5	1	1
Oklahoma City.....	4	3	6	2	6	3	1	0
Omaha.....	0	0	0	0	0	0	0	0
Paterson.....	1	0	1	1	0	1	1	0
Philadelphia.....	14	19	12	15	13	19	9	2
Pittsburgh.....	19	6	5	11	8	8	7	6
Portland, Oreg.....	3	0	3	3	3	4	3	1
Providence.....	7	2	4	1	3	2	0	0
Richmond.....	1	4	5	3	4	4	2	0
Rochester.....	2	2	1	3	0	0	0	0
St. Louis.....	1	2	1	1	1	0	0	2
St. Paul.....	2	0	2	0	0	1	5	0
Salt Lake City.....	1	0	2	0	1	0	2	0
San Antonio.....	8	10	5	10	9	12	4	5
San Diego.....	4	1	1	3	2	1	2	2
San Francisco.....	4	5	3	4	1	0	3	1
Schenectady.....	2	2	0	2	0	2	0	1
Seattle.....	4	1	1	5	5	2	3	1
Somerville.....	1	0	0	1	0	0	1	0
Spokane.....	3	2	2	1	3	2	1	1
Springfield, Mass.....	1	1	0	1	2	0	0	0
Syracuse.....	2	1	0	2	0	1	0	1
Tacoma.....	1	2	0	0	1	0	0	0

<sup>1</sup> Tables showing influenza and pneumonia deaths in these cities for the 14 weeks ended Feb. 2, 1929, will be found in the Public Health Reports for Jan. 11, 1929, p. 63, and Feb. 15, 1929, p. 350.

*Deaths from influenza and pneumonia in 78 large cities during eight weeks ended March 30, 1929—Continued*

INFLUENZA DEATHS—Continued

City	Week ended—							
	Feb. 9, 1929	Feb. 16, 1929	Feb. 23, 1929	Mar. 2, 1929	Mar. 9, 1929	Mar. 16, 1929	Mar. 23, 1929	Mar. 30, 1929
Toledo.....	8	5	1	2	7	1	8	1
Trenton.....	1	0	2	3	1	0	0	0
Utica.....	3	1	1	3	1	2	0	0
Washington, D. C.....	7	4	4	1	4	1	0	0
Waterbury.....	1	0	0	1	1	1	2	0
Wilmington, Del.....	2	3	1	1	0	2	2	0
Worcester.....	1	2	0	1	1	0	0	0
Yonkers.....	0	0	0	0	0	1	0	0
Youngstown.....	4	1	0	2	2	1	2	1

DEATHS FROM PNEUMONIA (ALL FORMS)

Total.....	1,526	1,413	1,255	1,433	1,280	1,219	1,104	999
Akron.....	8	3	10	5	4	6	11	7
Albany.....	11	10	3	10	9	3	7	10
Atlanta.....	12	8	7	12	13	7	6	6
Baltimore.....	54	51	49	62	48	47	33	29
Birmingham.....	7	6	5	14	10	8	9	7
Boston.....	87	67	46	64	45	35	39	34
Bridgeport.....	9	5	8	4	7	4	5	7
Buffalo.....	29	33	24	18	24	21	23	24
Cambridge.....	10	4	7	4	3	9	2	6
Camden.....	7	5	2	5	7	6	2	3
Canton.....	4	6	1	3	4	3	4	4
Chicago.....	73	92	85	104	87	82	83	61
Cincinnati.....	14	18	23	20	25	19	16	10
Cleveland.....	28	45	34	31	27	27	21	33
Columbus.....	8	9	11	9	9	10	3	6
Dallas.....	7	7	10	7	9	15	4	8
Dayton.....	5	7	4	6	6	3	3	7
Denver.....	15	16	15	15	14	16	10	5
Des Moines.....	3	2	6	6	2	2	5	3
Detroit.....	24	59	60	44	53	58	42	51
Duluth.....	3	2	2	4	2	4	5	1
El Paso.....	7	15	8	5	6	12	6	3
Erie.....	3	2	4	1	4	4	1	0
Fall River.....	11	0	5	5	4	2	3	2
Flint.....	4	9	8	3	5	4	4	3
Fort Worth.....	3	3	5	7	13	6	7	1
Grand Rapids.....	2	1	5	4	1	3	1	3
Houston.....	9	5	9	8	16	8	4	3
Indianapolis.....	18	21	15	31	21	16	17	14
Jersey City.....	28	17	15	14	13	18	10	14
Kansas City, Kans.....	8	10	8	7	1	5	6	4
Kansas City, Mo.....	23	17	17	22	13	24	17	19
Knoxville.....	1	0	2	8	1	3	2	6
Los Angeles.....	31	18	29	34	25	32	47	38
Louisville.....	28	15	16	29	21	15	15	9
Lowell.....	16	8	4	4	5	7	2	3
Lynn.....	12	4	3	1	5	2	5	2
Memphis.....	7	8	6	6	7	9	3	8
Milwaukee.....	23	18	9	22	13	14	24	16
Minneapolis.....	4	9	19	6	8	9	8	5
Nashville.....	10	3	8	13	6	6	5	4
New Bedford.....	12	6	7	7	5	10	6	2
New Haven.....	16	14	10	9	10	9	8	9
New Orleans.....	10	11	22	13	16	18	16	14
New York.....	404	353	236	293	282	225	225	211
Newark, N. J.....	19	14	6	23	17	18	14	13
Oakland.....	5	6	5	10	7	6	7	2
Oklahoma City.....	9	8	12	9	10	10	7	3
Omaha.....	15	9	7	14	10	9	12	10
Paterson.....	10	6	12	6	3	4	6	7
Philadelphia.....	73	66	71	94	74	72	70	67
Pittsburgh.....	40	31	30	37	46	38	38	30
Portland, Oreg.....	3	12	13	6	7	11	7	9
Providence.....	22	17	11	19	13	13	9	8
Richmond.....	3	5	14	8	7	5	4	7
Rochester.....	21	10	10	8	9	11	7	7
St. Louis.....	34	46	39	50	29	47	48	27
St. Paul.....	12	9	9	9	11	5	8	8

*Deaths from influenza and pneumonia in 78 large cities during eight weeks ended March 30, 1929—Continued*

DEATHS FROM PNEUMONIA (ALL FORMS)—Continued

City	Week ended—							
	Feb. 9, 1929	Feb. 16, 1929	Feb. 23, 1929	Mar. 2, 1929	Mar. 9, 1929	Mar. 16, 1929	Mar. 23, 1929	Mar. 30, 1929
Salt Lake City.....	4	3	4	4	3	8	3	4
San Antonio.....	10	17	15	15	10	10	4	2
San Diego.....	2	3	2	3	3	2	6	2
San Francisco.....	12	18	9	11	11	9	4	11
Schenectady.....	0	5	2	5	2	0	1	2
Seattle.....	8	10	12	8	13	6	5	2
Somerville.....	9	6	7	6	3	2	2	2
Spokane.....	1	4	6	4	4	2	2	3
Springfield, Mass.....	8	8	5	7	5	6	3	4
Syracuse.....	6	6	10	6	10	12	10	9
Tacoma.....	1	3	3	2	2	2	0	2
Toledo.....	8	11	9	8	9	7	4	3
Trenton.....	12	8	4	7	9	1	5	6
Utica.....	4	3	4	5	2	4	3	6
Washington, D. C.....	36	18	15	24	25	22	17	8
Waterbury.....	6	7	6	8	2	4	4	0
Wilmington, Del.....	5	11	4	4	5	5	7	10
Worcester.....	6	3	3	7	6	7	3	1
Yonkers.....	6	2	5	2	7	7	3	0
Youngstown.....	8	6	9	5	3	7	6	10

DEATHS DURING WEEK ENDED APRIL 13, 1929

*Summary of information received by telegraph from industrial insurance companies for the week ended April 13, 1929, and corresponding week of 1928. (From the Weekly Health Index, April 18, 1929, issued by the Bureau of the Census, Department of Commerce)*

	Week ended Apr. 13, 1929	Corresponding week, 1928
Policies in force.....	73, 575, 593	70, 936, 640
Number of death claims.....	15, 307	17, 006
Death claims per 1,000 policies in force, annual rate.....	10. 8	12. 5

*Deaths from all causes in certain large cities of the United States during the week ended April 13, 1929, infant mortality, annual death rate, and comparison with corresponding week of 1928. (From the Weekly Health Index, April 18, 1929, issued by the Bureau of the Census, Department of Commerce)*

City	Week ended Apr. 13, 1929		Annual death rate per 1,000 corre- sponding week, 1928	Deaths under 1 year		Infant mortality rate, week ended Apr. 13, 1929 <sup>1</sup>
	Total deaths	Death rate <sup>1</sup>		Week ended Apr. 13, 1929	Corre- sponding week, 1928	
Total (64 cities).....	7, 585	13. 5	14. 6	723	978	62
Akron.....	47			8	10	83
Albany.....	36	15. 6	17. 8	3	5	59
Atlanta.....	77	15. 8	17. 0	4	11	42
White.....	40			4	4	
Colored.....	37	( <sup>5</sup> )	( <sup>9</sup> )	0	7	
Baltimore.....	223	14. 0	17. 9	18	31	58
White.....	168			11	22	44
Colored.....	55	( <sup>5</sup> )	( <sup>9</sup> )	7	9	111
Birmingham.....	61	14. 3	14. 6	6	11	54
White.....	29			3	3	45
Colored.....	32	( <sup>5</sup> )	( <sup>9</sup> )	3	8	60

Footnotes at end of table.

*Deaths from all causes in certain large cities of the United States during the week ended April 13, 1929, infant mortality, annual death rate, and comparison with corresponding week of 1928—Continued*

City	Week ended Apr. 13, 1929		Annual death rate per 1,000 corresponding week, 1928	Deaths under 1 year		Infant mortality rate, week ended Apr. 13, 1929 <sup>2</sup>
	Total deaths	Death rate <sup>1</sup>		Week ended Apr. 13, 1929	Corresponding week, 1928	
Boston.....	231	15.1	16.0	29	30	80
Bridgeport.....	24			2	5	35
Buffalo.....	133	12.5	16.6	18	22	78
Cambridge.....	28	11.6	12.1	5	4	90
Camden.....	40	15.4	18.1	5	3	86
Canton.....	27	12.1	10.3	2	1	47
Chicago <sup>4</sup> .....	780	12.9	13.0	89	108	79
Cincinnati.....	139			13	20	76
Cleveland.....	222	11.5	11.0	21	22	62
Columbus.....	63	11.0	14.5	4	8	37
Dallas.....	54	13.0	12.5	11	9	
White.....	42			9	7	
Colored.....	12	( <sup>5</sup> )	( <sup>5</sup> )	2	2	
Dayton.....	49	13.9	12.5	5	5	79
Denver.....	83	14.8	17.1	10	10	97
Des Moines.....	46	15.8	10.7	4	1	72
Detroit.....	359	13.6	13.6	37	58	59
Duluth.....	27	12.1	10.7	3	5	72
El Paso.....	34	15.1	20.0	7	14	
Erie.....	22			1	2	20
Fall River <sup>4</sup> .....	29	11.3	12.5	5	7	94
Flint.....	37	13.0	12.6	5	9	61
Fort Worth.....	28	8.6	13.8	4	6	
White.....	22			2	3	
Colored.....	6	( <sup>5</sup> )	( <sup>5</sup> )	2	3	
Grand Rapids.....	31	9.9	13.7	5	6	76
Houston.....	55			6	12	
White.....	40			4	9	
Colored.....	15	( <sup>5</sup> )	( <sup>5</sup> )	2	3	
Indianapolis.....	99	13.5	16.1	4	15	32
White.....	84			3	14	28
Colored.....	15	( <sup>5</sup> )	( <sup>5</sup> )	1	1	60
Jersey City.....	75	12.1	14.7	5	9	39
Kansas City, Kans.....	29	12.8	16.4	1	4	22
White.....	22			0	1	0
Colored.....	7	( <sup>5</sup> )	( <sup>5</sup> )	1	3	179
Knoxville.....	45	22.3	9.9	4	2	87
White.....	37			4	2	98
Colored.....	8	( <sup>5</sup> )	( <sup>5</sup> )	0	0	0
Los Angeles.....	232			21	25	62
Louisville.....	102	16.2	13.5	3	5	24
White.....	85			3	5	28
Colored.....	17	( <sup>5</sup> )	( <sup>5</sup> )	0	0	0
Lowell.....	33			5	4	113
Lynn.....	28	13.9	13.9	3	2	82
Memphis.....	83	22.8	20.3	8	13	94
White.....	43			3	4	57
Colored.....	40	( <sup>5</sup> )	( <sup>5</sup> )	5	9	156
Milwaukee.....	133	12.8	14.2	24	25	105
Minneapolis.....	107	12.3	15.8	7	14	43
Nashville.....	51	19.1	20.6	4	7	65
White.....	32			2	3	43
Colored.....	19	( <sup>5</sup> )	( <sup>5</sup> )	2	4	126
New Bedford.....	25			3	4	64
New Haven.....	38	10.6	7.0	2	3	31
New Orleans.....	135	16.4	16.8	11	14	55
White.....	78			7	8	49
Colored.....	57	( <sup>5</sup> )	( <sup>5</sup> )	4	6	67
New York.....	1,562	13.6	15.3	156	199	64
Bronx Borough.....	193	10.6	12.9	20	19	59
Brooklyn Borough.....	548	12.4	12.8	67	79	68
Manhattan Borough.....	653	19.5	21.8	59	81	72
Queens Borough.....	120	7.3	10.6	7	14	29
Richmond Borough.....	48	16.7	20.8	3	6	54
Newark, N. J.....	116	12.8	12.8	14	11	74
Oakland.....	55	10.5	9.2	4	6	44
Oklahoma City.....	30			1	3	20
Omaha.....	59	13.8	12.0	3	2	35
Paterson.....	28	10.1	9.7	4	2	71
Philadelphia.....	571	14.5	16.7	43	64	61
Pittsburgh.....	145	11.3	16.0	15	26	52

Footnotes at end of table.

*Deaths from all causes in certain large cities of the United States during the week ended April 13, 1929, infant mortality, annual death rate, and comparison with corresponding week of 1928—Continued*

City	Week ended Apr. 13, 1929		Annual death rate per 1,000, corresponding week, 1928	Deaths under 1 year		Infant mortality rate, week ended Apr. 13, 1929 <sup>1</sup>
	Total deaths	Death rate <sup>1</sup>		Week ended Apr. 13, 1929	Corresponding week, 1928	
Portland, Oreg.....	62			1	4	11
Providence.....	66	12.1	16.8	9	10	79
Richmond.....	56	15.1	12.6	9	4	126
White.....	35			2	3	42
Colored.....	21	( <sup>2</sup> )	( <sup>2</sup> )	7	1	287
Rochester.....	83	13.2	15.8	9	12	76
St. Louis.....	228	14.1	14.5	15	23	51
St. Paul.....	60			4	1	41
Salt Lake City <sup>4</sup> .....	34	12.9	9.1	5	4	77
San Antonio.....	78	18.7	18.0	11	21	
San Diego.....	55	24.0	22.3	1	5	19
San Francisco.....	168	15.0	16.6	8	10	51
Schenectady.....	14	7.8	12.9	1	4	32
Seattle.....	72	9.8	11.9	6	2	64
Somerville.....	27	13.7	7.6	5	2	180
Spokane.....	20	9.6	11.0	1	5	26
Springfield, Mass.....	37	12.9	12.9	5	4	83
Syracuse.....	48	12.6	14.2	3	8	31
Tacoma.....	39	18.5	12.3	2	1	57
Toledo.....	80	13.4	9.2	4	5	36
Trenton.....	34	12.8	22.2	1	10	18
Washington, D. C.....	150	14.2	13.4	4	7	23
White.....	91			3	4	25
Colored.....	59	( <sup>2</sup> )	( <sup>2</sup> )	1	3	19
Waterbury.....	21			0	4	0
Wilmington, Del.....	26	10.6	12.6	3	5	78
Worcester.....	60	15.9	19.1	2	8	25
Yonkers.....	18	7.8	9.1	1	4	23
Youngstown.....	33	9.9	12.0	3	6	43

<sup>1</sup> Annual rate per 1,000 population.

<sup>2</sup> Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.

<sup>3</sup> Data for 71 cities.

<sup>4</sup> Deaths for week ended Friday.

<sup>5</sup> In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: 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; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.



# 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 April 13, 1929, and April 14, 1928

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 13, 1929, and April 14, 1928*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928
<b>New England States:</b>								
Maine.....	9	7	1	1	257	42	0	0
New Hampshire.....	1	1	8		78		0	0
Vermont.....		1			3	40	0	0
Massachusetts.....	98	90	22	25	423	1,573	6	2
Rhode Island.....	12	15			97	236	0	0
Connecticut.....	15	23	10	13	620	369	3	0
<b>Middle Atlantic States:</b>								
New York.....	280	363	123	117	1,095	2,723	36	37
New Jersey.....	92	113	6	23	286	1,582	5	3
Pennsylvania.....	154	169			1,939	1,885	12	9
<b>East North Central States:</b>								
Ohio.....	89	142	65	84	2,691	1,034	20	6
Indiana.....	5	21		18	616	435	0	0
Illinois.....	183	103	128	219	1,922	164	20	11
Michigan.....	81	49	11	16	891	1,472	77	0
Wisconsin.....	14	22	19	412	1,293	101	5	9
<b>West North Central States:</b>								
Minnesota.....	20	17	1	44	529	93	3	4
Iowa.....	9	9			83	31	0	1
Missouri.....	32	27	5	52	368	89	17	4
North Dakota.....	4	5		44	125	15	4	1
South Dakota.....	10	5		16	17	45	7	3
Nebraska.....	9	6		63	72	30	2	1
Kansas.....	9	2	13	7	471	78	1	2

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

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 13, 1929, and April 14, 1928—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928
<b>South Atlantic States:</b>								
Delaware.....	1				18	27	0	0
Maryland <sup>1</sup> .....	25	31	23	26	68	1,074	1	0
District of Columbia.....	8	14	1	4	24	157	0	1
Virginia.....							2	
West Virginia.....	11	15	25	13	376	328	0	0
North Carolina.....	31	22			42	1,959	0	0
South Carolina.....	11	17	344	657	10	553	0	0
Georgia.....	6	11	31	106	39	134	2	0
Florida.....	5	16	3	40	58	81	0	0
<b>East South Central States:</b>								
Kentucky.....				21		321	2	0
Tennessee.....	6	6	55	199	38	250	1	1
Alabama.....	11	15	46	286	200	408	1	1
Mississippi.....	8	5					1	
<b>West South Central States:</b>								
Arkansas.....	1	2	19	256	25	426	18	1
Louisiana.....	17	32	23	35	57	116	2	0
Oklahoma <sup>1</sup> .....	7	29	69	437	60	353	10	3
Texas.....	47	28	84	141	333	267	1	2
<b>Mountain States:</b>								
Montana.....	6	16	1		87	6	4	1
Idaho.....	1		6		4	9	3	3
Wyoming.....	3		1	1	27	21	2	3
Colorado.....	4	13	4	2	18	86	8	2
New Mexico.....	7	1	29			107	1	0
Arizona.....	6	14	27		7	34	8	2
Utah <sup>1</sup> .....	2	3	3	3	9	4	7	1
<b>Pacific States:</b>								
Washington.....	5	11	11	1	192	183	15	1
Oregon.....	9	14	58	34	242	68	2	2
California.....	51	78	74	52	54	118	27	2

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928
<b>New England States:</b>								
Maine.....	1	0	44	22	3	0	9	0
New Hampshire.....	0	0	16	7	0	0	0	0
Vermont.....	0	0	9	1	5	0	0	1
Massachusetts.....	0	0	308	294	1	0	7	4
Rhode Island.....	0	0	22	28	0	0	1	0
Connecticut.....	0	0	67	57	1	0	2	3
<b>Middle Atlantic States:</b>								
New York.....	2	1	483	724	1	3	20	15
New Jersey.....	0	0	180	285	0	3	0	3
Pennsylvania.....	0	1	378	578	0	2	9	6
<b>East North Central States:</b>								
Ohio.....	5	4	285	206	52	34	9	8
Indiana.....	0	0	180	111	48	138	12	1
Illinois.....	1	1	401	236	75	23	10	5
Michigan.....	1	0	585	237	63	45	4	6
Wisconsin.....	1	3	130	183	6	7	0	2
<b>West North Central States:</b>								
Minnesota.....	0	1	90	145	2	2	8	2
Iowa.....	4	0	120	51	46	57	4	1
Missouri.....	0	0	96	71	26	57	4	1
North Dakota.....	0	2	51	79	17	4	1	3
South Dakota.....	0	0	7	36	18	4	0	4
Nebraska.....	0	0	117	145	60	38	0	1
Kansas.....	0	0	181	159	64	60	2	2

<sup>1</sup> Week ended Friday.<sup>2</sup> Figures for 1929 are exclusive of Oklahoma City and Tulsa.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 13, 1929, and April 14, 1928—Continued*

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928	Week ended Apr. 13, 1929	Week ended Apr. 14, 1928
<b>South Atlantic States:</b>								
Delaware.....	0	0	2	3	0	1	0	0
Maryland.....	0	0	63	78	0	0	6	12
District of Columbia.....	0	0	12	27	0	1	0	0
Virginia.....								
West Virginia.....	2	0	9	48	22	54	7	6
North Carolina.....	0	0	47	24	17	58	2	3
South Carolina.....	0	0	14	7	6	12	12	11
Georgia.....	0	0	16	12	0	0	11	3
Florida.....	4	1	5	21	1	6	8	9
<b>East South Central States:</b>								
Kentucky.....	0	0	212	44	52	17	4	9
Tennessee.....	0	0	28	18	5	12	9	4
Alabama.....	1	2	16	8	11	11	11	6
Mississippi.....	0	2	8	11	2	5	4	5
<b>West South Central States:</b>								
Arkansas.....	0	0	10	12	3	13	10	2
Louisiana.....	0	0	47	7	5	20	11	12
Oklahoma.....	0	1	24	89	75	189	7	6
Texas.....	0	0	75	65	144	24	1	5
<b>Mountain States:</b>								
Montana.....	0	0	29	21	14	25	6	0
Idaho.....	0	0	21	6	15	5	0	5
Wyoming.....	1	0	35	28	10	3	1	0
Colorado.....	0	0	53	94	18	9	3	1
New Mexico.....	0	1	20	33	1	3	0	0
Arizona.....	0	0	11	5	8	43	0	0
Utah.....	0	0	11	4	9	15	0	0
<b>Pacific States:</b>								
Washington.....	0	0	34	27	37	36	3	5
Oregon.....	0	0	41	6	28	47	0	2
California.....	0	5	476	114	36	28	1	4

<sup>1</sup> Week ended Friday.

<sup>2</sup> Figures for 1929 are exclusive of Oklahoma City and Tulsa.

## SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports 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	Meas- les	Pel- lagra	Polio- mye- litis	Scarlet fever	Small pox	Ty- phoid fever
<i>January, 1929</i>										
Hawaii Territory.....	10	40	79		10		0	12	0	9
<i>February, 1929</i>										
Florida.....	1	62	181	122	72	4	1	47	4	24
<i>March, 1929</i>										
Arizona.....	40	14	9		58		1	27	74	7
Arkansas.....	14	30	648	93	446	29	0	66	69	12
Colorado.....	38	34	22		74		3	140	86	4
Connecticut.....	14	90	5, 159		2, 122		0	279	21	3
District of Columbia.....	2	56	18		84		0	110	0	1
Maine.....	4	20	79		1, 359		1	234	35	4
Nebraska.....	9	73	24		189		1	510	256	3
New Hampshire.....		7	79				0	105	0	0
New Jersey.....	20	462	130		1, 214		2	809	0	11
North Dakota.....	16	33	5		321		2	246	15	4
Porto Rico.....		70	72	1, 201	1, 008	3	0		0	71
Tennessee.....	11	71	1, 234	54	63	23	1	284	9	22
Vermont.....		11			154		0	74	5	

## January, 1929

	Cases
Hawaii Territory:	
Chicken pox.....	20
Conjunctivitis, follicular.....	108
Hookworm disease.....	2
Impetigo contagiosa.....	3
Leprosy.....	4
Mumps.....	9
Tetanus.....	1
Trachoma.....	206
Whooping cough.....	242

## February, 1929

Florida:	
Chicken pox.....	98
Dengue.....	1
Dysentery.....	6
Leprosy.....	1
Lethargic encephalitis.....	2
Mumps.....	10
Paratyphoid fever.....	1
Typhus fever.....	1
Whooping cough.....	82

## March, 1929

Anthrax:	
New Jersey.....	2
Chicken pox:	
Arizona.....	59
Arkansas.....	222
Colorado.....	434
Connecticut.....	358
District of Columbia.....	152
Maine.....	113
Nebraska.....	116
New Jersey.....	1,235
North Dakota.....	13
Tennessee.....	294
Vermont.....	41
Colibacillosis:	
Porto Rico.....	4
Conjunctivitis:	
Maine.....	1
Dukes' fourth disease:	
Arizona.....	1
Dysentery:	
New Jersey.....	5
Porto Rico.....	178
Tennessee.....	6
Filariasis:	
Porto Rico.....	7
German measles:	
Colorado.....	36
Connecticut.....	801
Maine.....	150
Nebraska.....	7
New Jersey.....	86
Hookworm disease:	
Arkansas.....	26
Impetigo contagiosa:	
Colorado.....	14
Lead poisoning:	
New Jersey.....	10
Lethargic encephalitis:	
Connecticut.....	4
North Dakota.....	5
Tennessee.....	3

Mumps:	Cases
Arizona.....	12
Arkansas.....	110
Colorado.....	176
Connecticut.....	431
Maine.....	88
Nebraska.....	148
North Dakota.....	132
Porto Rico.....	10
Tennessee.....	331
Vermont.....	274
Ophthalmia neonatorum:	
New Jersey.....	3
Porto Rico.....	2
Paratyphoid fever:	
Arizona.....	1
Maine.....	1
Puerperal fever:	
Porto Rico.....	24
Rabies in animals:	
Connecticut.....	4
Rabies in man:	
Tennessee.....	2
Scabies:	
Colorado.....	34
North Dakota.....	19
Septic sore throat:	
Connecticut.....	11
Maine.....	7
Nebraska.....	30
Tetanus:	
Porto Rico.....	10
Tennessee.....	1
Tetanus (infantile):	
Porto Rico.....	27
Trachoma:	
Arizona.....	4
Arkansas.....	3
Porto Rico.....	4
Tennessee.....	3
Trichinosis:	
New Jersey.....	1
Typhus fever:	
Arkansas.....	1
Undulant fever:	
Tennessee.....	1
Vincent's angina:	
Colorado.....	6
Maine.....	5
North Dakota.....	11
Whooping cough:	
Arizona.....	21
Arkansas.....	102
Colorado.....	45
Connecticut.....	115
District of Columbia.....	120
Maine.....	108
Nebraska.....	64
New Jersey.....	830
North Dakota.....	83
Porto Rico.....	73
Tennessee.....	200
Vermont.....	162

# PLAGUE-INFECTED GROUND SQUIRRELS IN CALIFORNIA

The director of public health of the State of California reports that on April 5, 1929, plague infection was proved in two lots of ground squirrels from a ranch 37 miles east of Monterey, Calif.

## 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 31,460,000. The estimated population of the 90 cities reporting deaths is more than 29,920,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

*Weeks ended April 6, 1929, and April 7, 1928*

	1929	1928	Estimated expectancy
<i>Cases reported</i>			
Diphtheria:			
46 States.....	1,379	1,574	
96 cities.....	796	800	883
Measles:			
45 States.....	13,877	20,596	
96 cities.....	5,098	7,569	
Meningococcus meningitis:			
46 States.....	320	157	
96 cities.....	131	81	
Poliomyelitis:			
46 States.....	15	27	
Scarlet fever:			
46 States.....	5,431	4,810	
96 cities.....	1,758	1,635	1,436
Smallpox:			
47 States.....	1,081	1,343	
96 cities.....	67	109	88
Typhoid fever:			
46 States.....	182	202	
96 cities.....	28	27	35
<i>Deaths reported</i>			
Influenza and pneumonia:			
90 cities.....	975	1,427	
Smallpox:			
90 cities.....	2	0	
Boston, Mass.....	1	0	
Fort Worth, Tex.....	1	0	

## City reports for week ended April 6, 1929

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1920 is included. In obtaining the estimated expectancy the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1928, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	78,600	1	1	0		0	38	0	0
New Hampshire:									
Concord	(1)	0	0	1	1	0	0	0	0
Manchester	85,700	0	1	2		0	0	0	0
Nashua	(1)	0	0	0		0	0	0	1
Vermont:									
Barre	(1)	0	0	1		0	0	6	0
Burlington	(1)	0	1	0		0	0	2	0
Massachusetts:									
Boston	799,200	62	37	29	7	0	21	35	11
Fall River	134,300	1	3	3	2	1	3	0	1
Springfield	149,800	3	3	5		0	12	2	2
Worcester	197,600	8	4	1	1	0	10	0	6
Rhode Island:									
Pawtucket	73,100		1						
Providence	286,300	0	8	13	1	3	82	0	13
Connecticut:									
Bridgeport	(1)	1	5	5	1	1	29	0	1
Hartford	172,300	2	6	1	2	0	33	8	5
New Haven	187,900	9	2	1	1	0	4	0	5
MIDDLE ATLANTIC									
New York:									
Buffalo	555,800	11	11	8		1	22	2	28
New York	6,017,500	278	252	275	35	17	134	198	232
Rochester	328,200	14	10	11	2	0	36	14	3
Syracuse	199,300	24	6	0		4	3	7	10
New Jersey:									
Camden	135,400	1	7	9	1	1	4	1	3
Newark	473,600	41	14	44	4	0	8	33	13
Trenton	139,000	5	3	1		0	3	0	4
Pennsylvania:									
Philadelphia	2,064,200	138	67	37	6	7	79	12	49
Pittsburgh	673,800	23	17	7	2	3	15	9	26
Reading	115,400	4	2	2		0	56	1	1
Scranton	144,700								
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	413,700	7	9	4		3	6	0	14
Cleveland	1,010,300	86	28	15	10	3	636	12	20
Columbus	299,000	6	4	0	1	1	56	0	4
Toledo	313,200	14	4	4	1	1	51	13	6
Indiana:									
Fort Wayne	105,300	5	2	4		0	26	0	3
Indianapolis	382,100	16	4	4		1	154	3	8
South Bend	86,100	1	1	0		0	11	0	1
Terre Haute	73,500	0	0	0		0	2	0	1
Illinois:									
Chicago	3,157,400	116	73	113	17	11	937	14	75
Springfield	67,200	1	1	0	2	0	3	0	1

<sup>1</sup> No estimate of population made.

## City reports for week ended April 6, 1929—Continued

Division, State, and city	Population July 1, 1928, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Michigan:									
Detroit.....	1,378,900	51	47	50	11	4	66	9	54
Flint.....	148,800	11	3	0		0	13	4	1
Grand Rapids.....	164,200	12	3	0		1	162	5	7
Wisconsin:									
Kenosha.....	58,500	8	1	0		0	47	2	1
Milwaukee.....	544,200	33	15	6	3	3	691	7	18
Racine.....	74,400	13	2	0		1	67	0	3
Superior.....	(1)	1	0	0		0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth.....	116,800	10	0	0		2	0	90	3
Minneapolis.....	455,900	56	14	6		0	250	86	4
St. Paul.....	(1)	17	11	3		1	370	42	8
Iowa:									
Davenport.....	(1)	3	1	0			0	0	
Des Moines.....	151,900	2	1	0			2	0	
Sioux City.....	80,000	7	1	1			10	0	
Waterloo.....	37,100	5	0	0			18	30	
Missouri:									
Kansas City.....	391,000	28	5	2		2	250	1	17
St. Joseph.....	78,500	1	1	0		0	10	0	3
St. Louis.....	848,100	44	40	24	1	1	8	11	
North Dakota:									
Fargo.....	(1)	3	0	0		1	45	0	0
Grand Forks.....	(1)	0	0	0			0	0	
South Dakota:									
Aberdeen.....	(1)	4	0	3			3	5	
Sioux Falls.....	(1)	0	0	0			6	0	
Nebraska:									
Omaha.....	222,800	13	2	1		0	32	2	8
Kansas:									
Topeka.....	62,800	6	1	0		2		1	1
Wichita.....	99,300	21	2	2		0	27	40	5
SOUTH ATLANTIC									
Delaware:									
Wilmington.....	128,500	2	2	3		0	11	0	6
Maryland:									
Baltimore.....	830,400	64	27	13	21	2	7	150	38
Cumberland.....	(1)	1	1	0		0	3	2	0
Frederick.....	(1)	0	0	0		0	0	1	0
District of Columbia:									
Washington.....	552,000	36	11	18	1	0	21	0	8
Virginia:									
Lynchburg.....	38,600	4	1	0		0	2	132	0
Norfolk.....	184,200	31	0	2		0	6	31	3
Richmond.....	194,400	4	2	0		2	1	4	3
Roanoke.....	64,600	4	0	2		2	1	0	1
West Virginia:									
Charleston.....	55,200	3	0	0	1	0	190	0	1
Wheeling.....	(1)	0	0	1		0	103	0	4
North Carolina:									
Raleigh.....	(1)	10	1	0		0	3	0	0
Wilmington.....	39,100	8	0	0		0	0	1	1
Winston-Salem.....	80,000	13	0	0		0	0	0	0
South Carolina:									
Charleston.....	75,900	0	0	2	23	0	0	0	2
Columbia.....	50,600	13	0	0		0	0	1	3
Greenville.....	(1)	4	0	0		0	0	0	0
Georgia:									
Atlanta.....	255,100	4	3	3	14	2	5	1	7
Brunswick.....	(1)	0	0	0		0	0	1	1
Savannah.....	99,900	1	0	1	2	0	0	0	0
Florida:									
Miami.....	156,700	8	3	1	1	0	70	0	4
St. Petersburg.....	53,300		0						
Tampa.....	113,400	3	1	1	1	1	0	0	2

<sup>1</sup> No estimate of population made.

## City reports for week ended April 6, 1929—Continued

Division, State, and city	Population July 1, 1928, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington.....	59,000	0	1	0	-----	0	0	0	0
Tennessee:									
Memphis.....	190,200	20	3	0	-----	2	0	2	6
Nashville.....	139,600	1	1	1	-----	4	1	0	5
Alabama:									
Birmingham.....	222,400	1	2	2	4	4	0	2	5
Mobile.....	69,600	1	0	1	1	0	12	0	3
Montgomery.....	63,100	9	0	0	-----	-----	0	0	-----
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith.....	( <sup>1</sup> )	-----	0	-----	-----	-----	-----	-----	-----
Little Rock.....	79,200	1	0	0	-----	2	0	0	2
Louisiana:									
New Orleans.....	429,400	3	7	8	8	5	7	0	16
Shreveport.....	81,300	10	0	1	-----	1	9	1	3
Oklahoma:									
Tulsa.....	170,500	19	1	1	-----	-----	11	1	-----
Texas:									
Dallas.....	217,800	9	4	11	1	1	39	1	5
Fort Worth.....	170,600	5	2	3	-----	3	16	2	1
Galveston.....	50,600	0	1	0	-----	1	0	0	2
Houston.....	( <sup>1</sup> )	0	2	6	-----	0	9	0	6
San Antonio.....	218,100	2	1	4	-----	2	1	0	1
MOUNTAIN									
Montana:									
Billings.....	( <sup>1</sup> )	13	1	1	-----	1	0	1	0
Great Falls.....	( <sup>1</sup> )	4	0	0	-----	0	40	1	1
Helena.....	( <sup>1</sup> )	4	0	0	-----	0	2	0	1
Missoula.....	( <sup>1</sup> )	0	0	0	-----	0	0	0	1
Idaho:									
Boise.....	( <sup>1</sup> )	1	0	0	-----	0	1	0	0
Colorado:									
Denver.....	294,200	64	10	2	1	4	12	45	4
Pueblo.....	44,200	27	1	0	-----	0	6	0	4
New Mexico:									
Albuquerque.....	( <sup>1</sup> )	11	0	0	-----	1	0	0	0
Utah:									
Salt Lake City.....	138,000	10	3	2	-----	0	8	110	2
Nevada:									
Reno.....	( <sup>1</sup> )	0	0	0	-----	0	2	0	1
PACIFIC									
Washington:									
Seattle.....	383,200	49	4	1	-----	-----	2	23	-----
Spokane.....	109,100	4	1	4	-----	-----	98	0	-----
Tacoma.....	110,500	14	1	0	-----	1	2	9	3
Oregon:									
Portland.....	( <sup>1</sup> )	6	8	5	-----	2	60	6	10
Salem.....	( <sup>1</sup> )	0	0	0	-----	0	2	1	0
California:									
Los Angeles.....	( <sup>1</sup> )	102	41	8	28	4	7	46	20
Sacramento.....	75,700	9	2	0	1	0	0	4	6
San Francisco.....	585,300	16	20	11	10	1	4	5	11

<sup>1</sup> No estimate of population made.



## City reports for week ended April 6, 1929—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		
NEW ENGLAND											
Maine:											
Portland.....	3	12	0	0	0	0	0	1	0	2	14
New Hampshire:											
Concord.....	1	0	0	0	0	0	0	0	0	1	7
Manchester.....	3	2	0	0	0	2	0	0	0	0	11
Nashua.....	1	0	0	0	0	0	0	0	0	0	9
Vermont:											
Barre.....	0	0	0	0	0	2	0	0	0	4	3
Burlington.....	1	0	0	2	0	0	0	0	0	4	-----
Massachusetts:											
Boston.....	77	89	0	1	1	10	1	1	0	38	227
Fall River.....	5	7	0	0	0	2	0	0	0	8	33
Springfield.....	7	6	0	0	0	3	0	0	0	0	41
Worcester.....	10	4	0	0	0	4	0	0	0	17	69
Rhode Island:											
Pawtucket.....	2	-----	0	-----	-----	-----	0	-----	-----	-----	-----
Providence.....	11	17	0	0	0	2	1	0	0	0	80
Connecticut:											
Bridgeport.....	12	6	0	0	0	1	1	0	0	0	27
Hartford.....	5	5	0	0	0	2	0	0	0	13	43
New Haven.....	11	3	0	0	0	2	0	0	0	0	41
MIDDLE ATLANTIC											
New York:											
Buffalo.....	26	30	0	0	0	6	0	0	0	14	153
New York.....	334	317	0	0	0	110	9	5	1	38	1,588
Rochester.....	15	5	0	0	0	5	0	0	0	11	73
Syracuse.....	14	18	0	0	0	1	1	0	0	16	52
New Jersey:											
Camden.....	6	11	0	0	0	3	0	0	0	0	34
Newark.....	36	23	0	0	0	5	1	0	0	25	122
Trenton.....	4	5	0	0	0	5	0	0	0	1	44
Pennsylvania:											
Philadelphia.....	105	77	0	0	0	37	2	0	0	78	552
Pittsburgh.....	30	12	0	0	0	9	0	0	0	25	194
Reading.....	4	7	0	0	0	0	0	0	0	4	27
EAST NORTH CENTRAL											
Ohio:											
Cincinnati.....	19	88	1	7	0	8	0	0	0	18	129
Cleveland.....	36	23	0	0	0	24	1	0	0	61	198
Columbus.....	11	1	1	0	0	8	0	0	0	12	67
Toledo.....	13	13	1	0	0	6	1	0	0	65	67
Indiana:											
Fort Wayne.....	7	0	1	0	0	1	0	9	0	0	15
Indianapolis.....	9	68	10	0	0	4	0	1	0	20	112
South Bend.....	4	3	0	1	0	0	0	1	0	0	9
Terre Haute.....	2	4	1	0	0	1	0	0	0	0	20
Illinois:											
Chicago.....	127	169	2	1	0	67	2	0	0	47	757
Springfield.....	3	8	0	2	0	1	0	0	0	1	21
Michigan:											
Detroit.....	97	227	1	1	0	30	1	0	0	82	367
Flint.....	8	36	1	5	0	5	1	0	0	4	34
Grand Rapids.....	8	10	0	7	0	1	0	0	0	21	44
Wisconsin:											
Kenosha.....	3	0	0	0	0	1	0	0	0	13	6
Milwaukee.....	28	28	1	0	0	8	1	0	0	72	139
Racine.....	4	2	0	0	0	0	0	0	0	2	8
Superior.....	4	1	1	0	0	1	0	0	0	3	9
WEST NORTH CENTRAL											
Minnesota:											
Duluth.....	9	4	0	0	0	2	0	0	0	3	21
Minneapolis.....	50	23	3	0	0	2	0	0	0	95	90
St. Paul.....	33	9	0	0	0	4	0	0	0	46	58
Iowa:											
Davenport.....	2	2	2	0	-----	-----	0	1	-----	6	-----
Des Moines.....	5	37	3	0	-----	-----	0	0	-----	0	31
Sioux City.....	2	0	1	0	-----	-----	0	0	-----	3	-----
Waterloo.....	2	19	0	3	-----	-----	0	2	-----	5	-----

## City reports for week ended April 6, 1929—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 NORTH CENTRAL—CON.											
Missouri:											
Kansas City...	17	33	4	1	0	5	0	0	0	9	106
St. Joseph.....	3	3	0	0	0	1	0	0	0	1	17
St. Louis.....	38	19	3	0	0	11	2	0	1	57	249
North Dakota:											
Fargo.....	2	1	0	0	0	0	0	0	0	1	13
Grand Forks...	1	1	3	0	—	—	0	0	—	0	—
South Dakota:											
Aberdeen.....	2	0	0	4	—	—	0	0	—	0	—
Sioux Falls.....	2	3	0	1	—	—	0	0	—	0	8
Nebraska:											
Omaha.....	4	7	4	3	0	2	0	0	0	2	64
Kansas:											
Topeka.....	3	0	1	0	0	1	0	0	0	5	20
Wichita.....	4	25	1	2	0	0	0	0	0	3	32
SOUTH ATLANTIC											
Delaware:											
Wilmington.....	5	1	0	0	0	2	0	0	0	1	39
Maryland:											
Baltimore.....	33	11	0	0	0	22	2	0	1	142	250
Cumberland.....	0	0	0	0	0	0	0	0	0	0	5
Frederick.....	3	0	0	0	0	0	0	0	0	0	1
District of Colum- bia:											
Washington.....	24	22	1	0	0	10	0	0	0	25	125
Virginia:											
Lynchburg.....	0	0	0	0	0	0	0	0	0	0	10
Norfolk.....	2	2	0	0	0	1	0	0	0	34	—
Richmond.....	3	3	0	0	0	1	0	0	0	6	56
Roanoke.....	1	0	0	0	0	1	0	0	0	5	23
West Virginia:											
Charleston.....	0	0	0	0	0	1	0	1	0	16	20
Wheeling.....	2	0	0	0	0	0	0	0	0	2	20
North Carolina:											
Raleigh.....	0	0	0	0	0	2	0	0	0	6	5
Wilmington.....	0	0	0	0	0	0	0	0	0	3	5
Winston-Salem	1	3	2	0	0	2	0	0	0	29	8
South Carolina:											
Charleston.....	0	0	0	0	0	1	0	0	0	0	24
Columbia.....	0	2	1	0	0	1	0	0	0	1	20
Greenville.....	0	0	0	0	0	0	0	0	0	4	8
Georgia:											
Atlanta.....	4	8	3	2	0	7	0	0	1	9	83
Brunswick.....	0	0	0	0	0	0	0	0	0	0	4
Savannah.....	0	0	0	0	0	1	0	1	0	2	24
Florida:											
Miami.....	1	0	0	0	0	1	0	1	0	32	27
St. Petersburg	0	—	0	—	—	—	0	—	—	—	—
Tampa.....	0	0	0	0	0	5	1	0	0	6	28
EAST SOUTH CENTRAL											
Kentucky:											
Covington.....	2	3	0	0	0	0	0	0	0	0	16
Tennessee:											
Memphis.....	6	15	3	0	0	5	0	0	0	7	74
Nashville.....	1	8	1	1	0	4	0	1	0	3	54
Alabama:											
Birmingham...	2	2	9	0	0	7	1	0	0	9	70
Mobile.....	0	2	0	0	0	0	1	0	0	0	18
Montgomery...	0	1	0	0	—	—	0	0	—	0	—
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith.....	0	—	0	—	—	—	0	—	—	—	—
Little Rock.....	1	2	0	0	0	2	0	1	0	2	—
Louisiana:											
New Orleans...	6	40	1	0	0	9	2	1	1	1	149
Shreveport.....	1	1	0	0	0	1	0	0	0	0	31



## City reports for week ended April 6, 1929—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
<b>MIDDLE ATLANTIC—CON.</b>									
New Jersey:									
Newark.....	0	1	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia.....	4	2	2	2	0	0	0	0	0
Pittsburgh.....	2	3	0	1	0	0	0	0	0
<b>EAST NORTH CENTRAL</b>									
Ohio:									
Cincinnati.....	0	0	1	0	0	0	0	0	0
Cleveland.....	4	1	1	0	0	0	0	1	0
Columbus.....	0	0	0	0	0	0	0	1	1
Toledo.....	4	2	0	0	0	0	0	0	0
Illinois:									
Chicago.....	16	3	1	0	0	0	0	0	0
Michigan:									
Detroit <sup>1</sup> .....	16	10	0	0	0	0	0	0	0
Flint.....	2	2	0	0	0	0	0	0	0
Grand Rapids.....	0	1	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee.....	2	1	0	0	0	0	0	0	0
Superior.....	0	1	0	0	0	0	0	0	0
<b>WEST NORTH CENTRAL</b>									
Minnesota:									
St. Paul.....	0	0	1	0	0	0	0	0	0
Iowa:									
Sioux City.....	0	0	0	0	0	0	0	1	0
Missouri:									
Kansas City.....	5	4	0	1	0	0	0	0	0
St. Joseph.....	1	0	0	0	0	0	1	0	0
St. Louis.....	15	5	0	0	0	0	1	0	0
<b>SOUTH ATLANTIC</b>									
Maryland:									
Baltimore.....	0	0	1	1	0	0	0	0	0
District of Columbia:									
Washington.....	1	1	0	0	1	1	0	0	0
Virginia:									
Lynchburg.....	0	0	0	0	0	1	0	0	0
West Virginia:									
Charleston.....	0	0	0	0	0	0	0	1	0
North Carolina:									
Raleigh.....	0	0	0	0	0	1	0	0	0
Georgia:									
Atlanta.....	1	0	0	0	0	0	0	0	0
Brunswick.....	0	0	0	1	0	0	0	0	0
Florida: <sup>2</sup>									
Tampa.....	0	0	0	0	1	0	0	0	0
<b>EAST SOUTH CENTRAL</b>									
Tennessee:									
Nashville.....	1	1	0	0	0	0	0	0	0
Alabama:									
Birmingham.....	0	0	0	0	1	2	0	0	0
Montgomery.....	0	0	0	0	1	0	0	0	0
<b>WEST SOUTH CENTRAL</b>									
Arkansas:									
Little Rock.....	0	0	0	0	0	1	0	0	0
Louisiana:									
New Orleans.....	8	3	1	1	4	1	0	0	0
Oklahoma:									
Tulsa.....	4	0	0	0	0	0	0	0	0
Texas:									
Dallas.....	1	1	0	0	0	0	0	0	0
Fort Worth.....	0	0	0	0	0	2	0	0	0
Houston.....	0	0	0	0	0	1	0	0	0

<sup>1</sup> Rabies (in man); 1 death at Detroit, Mich.<sup>2</sup> Typhus fever; 1 case at Miami, Fla.

## City reports for week ended April 6, 1929—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
<b>MOUNTAIN</b>									
Colorado:									
Denver.....	2	1	0	0	0	0	0	0	0
Pueblo.....	0	0	0	1	0	0	0	0	0
Utah:									
Salt Lake City.....	4	4	0	0	0	0	0	0	0
<b>PACIFIC</b>									
Washington:									
Seattle.....	1	0	0	0	0	0	0	0	0
California:									
Los Angeles.....	5	1	0	0	3	1	1	0	0
Sacramento.....	1	1	0	0	0	0	0	0	0
San Francisco.....	1	3	0	0	0	0	0	0	0

The following table gives the rates per 100,000 population for 98 cities for the 5-week period ended April 6, 1929, compared with those for a like period ended April 7, 1928. The population figures used in computing the rates are approximate estimates, authoritative figures for many of the cities not being available. The 98 cities reporting cases have estimated aggregate populations of more than 31,000,000. The 91 cities reporting deaths have nearly 30,000,000 estimated population. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

*Summary of weekly reports from cities, March 3 to April 6, 1929—Annual rates per 100,000 population compared with rates for the corresponding period of 1928*<sup>1</sup>

## DIPHTHERIA CASE RATES

	Week ended—									
	Mar. 9, 1929	Mar. 10, 1928	Mar. 16, 1929	Mar. 17, 1928	Mar. 23, 1929	Mar. 24, 1928	Mar. 30, 1929	Mar. 31, 1928	Apr. 6, 1929	Apr. 7, 1928
98 cities.....	134	174	127	160	135	161	129	140	132	135
New England.....	109	145	136	136	120	124	102	110	140	126
Middle Atlantic.....	185	214	159	213	180	223	187	181	190	189
East North Central.....	130	171	120	135	142	148	119	146	125	121
West North Central.....	144	131	152	115	131	133	138	84	75	102
South Atlantic.....	67	132	84	151	60	122	66	128	82	96
East South Central.....	68	84	54	119	41	56	41	70	27	35
West South Central.....	119	170	99	138	123	118	123	109	142	134
Mountain.....	61	97	44	106	35	80	44	115	44	44
Pacific.....	37	171	67	125	70	105	30	74	60	77

<sup>1</sup> 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, 1929 and 1928, respectively.

<sup>2</sup> Pawtucket, R. I., and Fort Smith, Ark., not included.

<sup>3</sup> Pawtucket, R. I., not included.

<sup>4</sup> Fort Smith, Ark., not included.

Summary of weekly reports from cities, March 3 to April 6, 1929—Annual rates per 100,000 population compared with rates for the corresponding period of 1928—Continued

## MEASLES CASE RATES

	Week ended—									
	Mar. 9, 1929	Mar. 10, 1928	Mar. 16, 1929	Mar. 17, 1928	Mar. 23, 1929	Mar. 24, 1928	Mar. 30, 1929	Mar. 31, 1928	Apr. 6, 1929	Apr. 7, 1928
98 cities .....	539	1,120	681	1,356	760	1,325	719	1,375	845	1,275
New England.....	428	1,656	622	2,267	568	1,536	471	2,014	542	1,874
Middle Atlantic.....	162	973	135	1,216	179	1,397	154	1,495	174	1,508
East North Central.....	982	864	1,385	1,061	1,593	1,008	1,590	1,021	1,834	1,033
West North Central.....	1,698	491	1,965	593	1,880	728	1,782	751	1,961	765
South Atlantic.....	234	2,830	380	3,105	452	3,021	414	3,008	650	2,366
East South Central.....	61	1,227	41	1,824	136	1,361	88	1,354	88	596
West South Central.....	107	1,309	146	1,346	198	1,135	99	847	264	442
Mountain.....	819	283	636	346	766	505	409	753	618	709
Pacific.....	147	906	137	832	247	809	239	581	282	448

## SCARLET FEVER CASE RATES

98 cities .....	299	299	326	301	346	309	319	303	291	276
New England.....	310	377	371	402	366	412	394	405	348	331
Middle Atlantic.....	228	359	266	353	308	375	264	399	244	367
East North Central.....	410	282	417	296	496	305	452	266	426	252
West North Central.....	356	291	367	272	292	293	310	258	275	264
South Atlantic.....	155	245	146	216	159	226	167	230	94	186
East South Central.....	197	173	231	63	306	154	265	77	210	91
West South Central.....	281	130	379	211	281	126	285	146	284	150
Mountain.....	157	195	157	248	113	177	78	186	104	239
Pacific.....	424	192	459	217	379	202	322	207	324	133

## SMALLPOX CASE RATES

98 cities .....	12	23	12	21	11	25	16	25	11	18
New England.....	0	0	5	0	7	0	11	0	2	0
Middle Atlantic.....	0	0	0	0	0	0	0	0	0	0
East North Central.....	18	14	20	26	12	18	17	24	15	24
West North Central.....	6	92	31	65	12	125	25	65	17	84
South Atlantic.....	6	25	6	36	0	25	13	75	7	15
East South Central.....	7	21	7	21	7	35	41	35	7	14
West South Central.....	99	36	43	45	103	36	95	36	81	4
Mountain.....	44	115	17	53	44	62	44	142	26	106
Pacific.....	17	69	22	38	15	61	22	23	17	18

## TYPHOID FEVER CASE RATES

98 cities .....	5	4	5	5	7	5	10	6	5	5
New England.....	5	2	2	7	7	9	5	5	5	2
Middle Atlantic.....	4	3	4	2	6	4	5	4	2	1
East North Central.....	3	4	2	3	4	3	17	2	7	3
West North Central.....	4	2	2	4	6	0	8	2	4	6
South Atlantic.....	6	10	7	11	6	11	13	23	4	13
East South Central.....	7	7	7	14	27	7	27	14	7	21
West South Central.....	20	4	12	12	8	8	20	12	8	16
Mountain.....	0	0	26	0	9	0	0	0	0	0
Pacific.....	17	3	10	5	20	5	0	3	7	8

<sup>1</sup> Pawtucket, R. I., and Fort Smith, Ark., not included.

<sup>2</sup> Pawtucket, R. I., not included.

<sup>3</sup> Fort Smith, Ark., not included.

*Summary of weekly reports from cities, January 27 to March 2, 1929—Annual rates per 100,000 population compared with rates for the corresponding period of 1928—Continued*

## INFLUENZA DEATH RATES

	Week ended—									
	Mar. 9, 1929	Mar. 10, 1928	Mar. 16, 1929	Mar. 17, 1928	Mar. 23, 1929	Mar. 24, 1928	Mar. 30, 1929	Mar. 31, 1928	Apr. 6, 1929	Apr. 7, 1928
91 cities.....	33	23	33	26	27	33	18	30	20	35
New England.....	16	21	25	7	5	9	5	11	12	16
Middle Atlantic.....	25	20	31	26	23	22	12	29	16	31
East North Central.....	31	16	23	12	20	35	16	24	18	40
West North Central.....	21	18	27	24	30	24	18	28	27	24
South Atlantic.....	47	27	37	21	30	42	22	23	17	21
East South Central.....	74	54	118	123	89	100	89	115	74	92
West South Central.....	122	75	106	117	77	100	37	87	49	108
Mountain.....	61	62	35	80	78	133	52	53	44	80
Pacific.....	23	20	16	10	33	7	16	13	20	7

## PNEUMONIA DEATH RATES

91 cities.....	204	196	185	227	169	218	158	225	150	218
New England.....	219	205	201	239	188	182	172	225	103	179
Middle Atlantic.....	233	221	197	259	190	245	180	265	178	244
East North Central.....	159	156	155	197	141	211	132	206	134	240
West North Central.....	195	144	180	208	189	178	150	196	147	184
South Atlantic.....	234	212	199	216	185	239	159	239	144	187
East South Central.....	237	306	200	268	170	222	170	161	141	283
West South Central.....	235	258	239	266	81	279	130	246	142	187
Mountain.....	183	266	253	204	165	168	131	106	122	97
Pacific.....	144	121	141	125	170	101	157	118	131	104

<sup>1</sup> Pawtucket, R. I., not included.

*Number of cities included in summary of weekly reports, and aggregate population of cities of each group, approximated as of July 1, 1929 and 1928, respectively*

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1929	1928	1929	1928
Total.....	98	91	31,568,400	31,052,700	29,995,100	29,498,600
New England.....	12	12	2,305,100	2,273,900	2,305,100	2,273,900
Middle Atlantic.....	10	10	10,809,700	10,702,200	10,809,700	10,702,200
East North Central.....	16	16	8,181,900	8,001,300	8,181,900	8,001,300
West North Central.....	12	9	2,712,100	2,673,300	1,736,900	1,708,100
South Atlantic.....	19	19	2,783,200	2,732,900	2,783,200	2,732,900
East South Central.....	6	5	767,900	745,500	704,200	682,400
West South Central.....	8	7	1,319,100	1,289,900	1,285,000	1,256,490
Mountain.....	9	9	598,800	590,200	598,800	590,200
Pacific.....	6	4	2,090,600	2,043,500	1,590,300	1,551,200

## FOREIGN AND INSULAR

### BRAZIL

*Quarantine by Argentina against Brazilian ports—Yellow fever.*—Sanitary measures imposed by the Argentine Government against all vessels touching at Brazilian ports and destined for any port in Argentina consist of quarantine observation of six days in the roads of Buenos Aires for all vessels without distinction. However, passenger vessels which embark an Argentine sanitary inspector in a Brazilian port diminish their sanitary observation period by as many days as they carry said inspector.

The Government of Argentina is said to be furnishing inspectors for passenger vessels, sending them to Brazilian ports at the expense of the interested companies. The delay in the roads at Buenos Aires should not exceed two days if an inspector boards the steamer at Rio de Janeiro.

### CANADA

*Provinces—Communicable diseases—Week ended March 30, 1929.*—The department of pensions and national health reports cases of certain communicable diseases from eight Provinces of Canada for the week ended March 30, 1929, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				3					3
Influenza	5		2	12				11	30
Lethargic encephalitis				1					1
Poliomyelitis								1	1
Smallpox			2	14	3	2	7	18	46
Typhoid fever			13	6	5		1		25

*Quebec Province—Communicable diseases—Week ended April 6, 1929.*—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended April 6, 1929, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	3	Ophthalmia neonatorum	1
Chicken pox	83	Scarlet fever	130
Diphtheria	54	Smallpox	9
German measles	6	Tuberculosis	22
Influenza	7	Typhoid fever	11
Measles	185	Whooping cough	26
Mumps	28		



## CUBA

*Provinces—Communicable diseases—December 16, 1928–March 2, 1929.*—During the 11 weeks from December 16, 1928, to March 2, 1929, cases of communicable diseases were reported from the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cerebrospinal meningitis.....	1						1
Chicken pox.....	1	51	10	21	8	96	187
Diphtheria.....	3	33	13	12	6	9	76
Malaria.....	5	63	1	6	95	433	603
Measles.....	36	914	27	18	13	1	1,009
Paratyphoid fever.....	7	3	4	21	2	21	58
Scarlet fever.....	5	21	4		1		31
Tetanus (infantile).....						1	1
Typhoid fever.....	47	66	17	60	12	97	299

*Habana—Communicable diseases—March, 1929.*—During the month of March, 1929, communicable diseases were reported from Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis.....	1	1	Measles.....	360	3
Chicken pox.....	22		Scarlet fever.....	6	
Diphtheria.....	16		Typhoid fever <sup>1</sup> .....	19	5
Malaria <sup>1</sup> .....	20	1			

<sup>1</sup> Many of these cases from the interior.

## CZECHOSLOVAKIA

*Communicable diseases—February, 1929.*—During the month of February, 1929, communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis.....	18	3	Scarlet fever.....	1,312	57
Diphtheria.....	1,029	120	Trachoma.....	209	
Dysentery.....	7		Typhoid fever.....	318	41
Paratyphoid fever.....	10		Typhus fever.....	7	1
Puerperal fever.....	53	26			

## FRANCE

*Passengers from Great Britain required to be vaccinated.*—A report from London, England, states that, beginning April 17, 1929, passengers from Great Britain would not be admitted to France unless they have certificates of vaccination within two months or consent to vaccination on arrival in France.

## VIRGIN ISLANDS

*Communicable diseases—March, 1929.*—During the month of March, 1929, communicable diseases were reported in the Virgin Islands, as follows:

St. Thomas and St. John:		St. Thomas and St. John—Continued	
Gonorrhea.....	2	Tuberculosis.....	2
Malaria.....	1	Uncinariasis.....	2
Syphilis.....	5	St. Croix:	
Tetanus.....	2	Pellagra.....	1
		Syphilis.....	4

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

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries for which the figures for the particular countries for which reports are given:

## CHOLERA

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

Place	Sept. 23- Oct. 20, 1928	Oct. 21- Nov. 19, 1928	Nov. 20- Dec. 18, 1928	Week ended—												
				December, 1928			January, 1929					February, 1929				
				22	29		5	12	19	26	2	9	16	23	2	9
Ceylon.....	C	D			5		2								2	2
Colombo.....	C	D			2		2								2	2
Ingliya Province.....	C	D						3	1	1						
China:																
Canton.....	C	D	2		2			1								1
Shanghai.....	D	D	1		1											
India.....	17,028	20,087	23,528	4,602	4,507	4,128	3,801	4,173	3,739	3,032	2,622	2,193				
Basseln.....	10,187	12,480	14,960	2,839	2,673	2,589	2,406	2,358	2,233	1,758	1,563	1,280			1	2
Bombay.....	15	1	4					1	4						1	1
Calcutta.....	7	1	4													
Madras.....	41	210	247	28	12	33	30	23	43	34	29	43	56	72	90	1
Madras Presidency.....	39	140	155	15	13	13	20	13	30	19	23	30	31	40	43	56
Moulmein.....	73	203	102	6	4	6	3	1	1	4	2	2	3	1	3	3
Negapatam.....		115	42			8						1				
Rangoon.....																
Tuticorin.....																
India (French):																
Chandernagor.....	16	43	25	2	1	1		1								1
Karikal.....	7	34	10	2	1	1										1
Pondicherry Province.....	9	111	7	4	9	20	21	40	61	31	18	28	10	28	22	14
	8	85	4	8	13	16	34	46	31	31	7	16	5	1	4	1
	31	6	5	25	37	26	27	58	32	22	29	18	29	10	21	12
	19	5	30	3	12	21	19	21	45	22	16	24	18	24	24	8



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

[illegible]



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

## PLAGUE—Continued

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

Place	Sept. 23- Oct. 20, 1928	Oct. 21- Nov. 17, 1928	Nov. 18- Dec. 15, 1928	Dec. 16- 1928	Week ended—											
					January, 1929			February, 1929			March, 1929			April, 1929		
					19 26 23			9 16 23			9 16 23			30 6 13		
					19	26	23	9	16	23	9	16	23	30	6	13
India.....	C 6,209	8,710	7,767	7,841	2,592	3,117	130	3,224	3,667	3,767						
Bassén.....	D 3,225	4,428	4,893	5,254	1,834	2,166	2,227	2,588	2,586							
Bombay.....	C 4	5	4	1	1	1	2	1	1		2	1	2			
Plague-infected rats.....	D 13	7	32	35	11	10	11	6	1		1	1	3			
Cochin.....	D			10							8	18	9	17		
Madras Presidency.....	D 196	539	686	500	120	107	66	77	103	90						
Rangoon.....	D 97	235	307	231	65	1	2	44	49	58						
Plague-infected rats.....	D 7	2	1	1	1	1	2	1	1	1	2	2	3			
Indo-China (see also table below):	C 5	3	1	2	1	1	2	5	1	4	3	3	2	2		
Pnompenh.....	C 1	1	4	8	2	4	1	3	2		1	2	3	2		
Saigon.....	D 1	1	4	6	2	4	1	2	1		1	1	3	2		
Tourane.....	C 1	1	1													
Iraq:	C								5							
Baghdad.....	C	9	10	9	2	1	3				1	6	3	4	5	2
Plague-infected rats.....	D 5	5	5	8		1	2				3	3	2	1		
Naudham.....	C					2	1	5	6	6	5	5	3	2	2	7
Plague-infected rats.....	D 1															
Madagascar (see also table below):	C								1							
Tamatave.....	C 13	7		2	1											
Morocco.....	D 10	3	1													
Nigeria:	D															
Lagos.....	C 88	83	43	12	1	4	2	7	2	4	5		1	1		
Plague-infected rats.....	D 88	77	41	11	1	3	1	7	2	4	5		1	1		
Paraguay, Asuncion.....	C 91	145	30	28		14	12	22	10	15	15					

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

## PLAGUE—Continued

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

Place	Sep-tem-ber, 1928	Octo-ber, 1928	No-ven-ber, 1928	De-cem-ber, 1928	Janu-ary, 1929	Feb-ru-ary, 1929	Place	Sep-tem-ber, 1928	Octo-ber, 1928	No-ven-ber, 1928	De-cem-ber, 1928	Janu-ary, 1929	Feb-ru-ary, 1929
British East Africa (see also table above):							Madagascar—Continued.						
Kenya.....	15	37	16	15	7	4	Tananarive Province.....	C	75	100	159	208	---
Uganda.....	128	134	---	---	---	---	Peru.....	D	62	95	144	192	---
Ecuador: Guayaquil.....	3	2	21	20	25	---	Senegal.....	D	3	10	18	26	37
Plague-infected rats.....	8	8	8	7	12	54	Baol <sup>1</sup> .....	D	1	4	6	6	---
Greece (see also table above).....	27	21	29	75	29	27	Cayor <sup>1</sup> .....	D	199	---	---	---	---
Indo-China (see also table above).....	---	---	1	1	1	---	Fatick <sup>1</sup> .....	D	127	---	---	---	---
Madagascar (see also table above).....	6	2	---	---	11	---	Louga <sup>1</sup> .....	D	73	39	18	4	---
Ambositra Province.....	59	88	---	282	---	---	Rufisque <sup>1</sup> .....	D	40	14	6	2	---
Antsirabe Province.....	51	84	14	79	109	---	Thies <sup>1</sup> .....	D	20	17	14	14	---
Itasy Province.....	---	8	14	4	15	---	Tivouane <sup>1</sup> .....	D	8	6	10	---	---
Moramanga Province.....	10	2	6	6	4	---	Syria: Beirut.....	C	---	35	---	---	---
Tamslave.....	2	5	6	11	3	---							
	2	2	0	1	3	---							
	20	38	32	28	23	---							
	18	35	32	27	21	---							
	18	9	2	2	4	---							
	10	7	2	2	4	---							

<sup>1</sup> Reports incomplete.



## SMALLPOX

Place	Sept. 23- Oct. 20, 1928	Oct. 21- Nov. 17, 1928	Nov. 18- Dec. 15, 1928	Dec. 16- 1928- Jan. 12, 1929	Week ended—											
					January, 1929			February, 1929			March, 1929					
					19	26	2	9	16	23	2	9	16	23	30	April, 1929
					19	26	2	9	16	23	2	9	16	23	30	6 13
Algeria:																
Algiers.....	4	2	1													
Cherchell.....																
Oran.....	21	1	1	1						4	11	6	11			
Arabis: Aden.....					1	1					1		1	11		
Brazil (see table below).																
British East Africa (see also table below), Kenya—																
Mombasa.....	1			3												
British South Africa:																
Northern Rhodesia.....	105	342	67	173												
Southern Rhodesia.....	7	14	8	23												
Tanganyika.....	9	1	5				1	12	1	16	1					
Canada:																
Alberta.....	4	4	21	3	3						2	1	1			
Calgary.....																
Edmonton.....				14	2						2					10
British Columbia—Vancouver.....	16	21	25	51	24	16	16	10	17	14	21	18	22	17		
Manitoba.....	1	14	29	23	3		12	6	2	5	3	5				
Winnipeg and vicinity.....			17													
New Brunswick.....															3	
Nova Scotia.....				5	1		1									
Ontario.....	15	12	15	36	7	4	25	47	38	23	15	7	21			
Kingston.....																
Niagara Falls.....		1														
North Bay.....			1						1	2			1			
Ottawa.....	2	6	2							1						
Sarnia.....		1														
Toronto.....														1		
Prince Edward Island.....																
Quebec.....	75	118	125	37	9	5	5	5	6	14	3	5	4	3	2	5
Montreal.....	4	10	3	8	5	2	2	1	3	10	2	1	3		1	
Quebec.....	12	12	6	4	4	2		2						1		
Riviere du Loup.....																1
Saskatchewan:																
Saskatoon.....	1	10	52	14	3	2	13	17	13	22	31	4		13		
Moose Jaw.....		2	1													
Regina.....			2	1	2	4										
Saskatoon.....							3	1						1		







[illegible]









Turkey (see table below).

Union of South Africa:

Cape Province.....

East London.....

Natal.....

Orange Free State.....

Transvaal.....

Yugoslavia (see table below).

Place	Octo-ber, 1928	De-cem-ber, 1928	Janu-ary, 1929	Feb-ru-ary, 1929	March, 1929	Place	Octo-ber, 1928	De-cem-ber, 1928	Janu-ary, 1929	Feb-ru-ary, 1929	March, 1929
Chosen:											
Chemulpo.....	1	1				Mexico: Sonora (see also table above).....	D				
Seoul.....	3	3				Peru.....	C	3	1		
Greece: Athens.....	1	1	13			Turkey.....	C	4	19	1	3
Lithuania.....			5			Yugoslavia.....	D	17	7	16	13
		4	22	24	63			1			
		11	3	3	1						

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

## YELLOW FEVER

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

Place	Week ended—															
	Sept. 23- Oct. 20, 1928	Oct. 21- Nov. 17, 1928	Nov. 18- Dec. 15, 1928	Dec. 16, 1928- Jan. 12, 1929	February, 1929								March, 1929			Apr. 6, 1929
					January, 1929		2	9	16	23	2	9	16	23	30	
					19	26										
Brazil:																
Bahia.....	C	1		2												
Guaratingueta.....	D			1												
Para.....	D			2												
Rio de Janeiro.....	C	6	2	2		1	7	19	13	11	21	47	59	61		
Sao Paulo.....	D	4	1	2			4	13	9	6	18	27	30	38		
Dahomey: Ouidah Military Camp.....	C															
Gambia: Bathurst.....	C		1	1												
Liberia: Monrovia.....	D		4	3												
On vessel:																
S. S. Bernini, at Santos, Brazil.....	C	4														
S. S. Victoria, at Manaus, from Para, Brazil.....	D	1		1												

120 cases of yellow fever with 14 deaths were reported at Rio de Janeiro during January, 1929, mostly suburban.  
 : Imported  
 : Suspected cases.