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## TULARÆMIA.

### XI. TULARÆMIA INFECTION IN TICKS OF THE SPECIES *DERMACENTOR ANDERSONI* STILES IN THE BITTERROOT VALLEY, MONT.

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The occurrence of tularæmia infection has been established in the Bitterroot Valley in western Montana in adult wood ticks of the species *Dermacentor andersoni* Stiles which were collected under natural conditions and were injected into guinea pigs in the course of routine tests for the presence in ticks of the infection of Rocky Mountain spotted fever.

The occurrence of tularæmia infection in ticks was suspected in numerous instances during the seasons of 1922 and 1923 on account of the gross lesions at death in guinea pigs into which such ticks had been injected. Definite confirmation has been furnished by Francis by the cultivation of *Bacterium tularensis* from guinea pigs in which the tick strain of tularæmia was being propagated.

Furthermore, field and experimental data indicate the possible importance of this wood tick in the transmission of tularæmia among rabbits and perhaps other rodents and to man.

The data on which these statements are made are presented below and may be briefly summarized as follows:

On May 19, 1923, unfed adult ticks were collected under natural conditions by dragging an outing-flannel cloth over vegetation; May 21, these ticks fed on a healthy guinea pig which died May 23 (no autopsy); May 31 these same ticks were injected into a guinea pig, causing acute death June 7 with typical lesions of tularæmia; from June 7 to June 23 the infection was carried by inoculation of guinea pig tissue for four transfers in guinea pigs; June 23 a culture of *Bacterium tularensis* was isolated from a fifth transfer guinea pig; July 7 this culture was inoculated into two guinea pigs on which larval ticks (lot 785) reared in the laboratory, fed from date of inoculation (July 7) to July 11-15. On August 21, August 29, and September 5, respectively, nymphal

sublots A, B, and C of lot 785 fed on Belgian hares Nos. 195, 207, and 212, causing acute death in each instance with typical lesions of tularæmia. On September 15, October 15, November 15, and again on December 15, an unfed adult tick from subplot 785-A was injected subcutaneously into a guinea pig causing acute death with typical lesions of tularæmia in each instance, and from these lesions *Bacterium tularensis* was recovered on culture medium. Typical infection was also secured from fed adults of this same lot which were injected subcutaneously into guinea pigs as follows: two lots of 4 ticks each on January 2, 1924; 2 lots of 1 tick each on January 9; 1 tick on January 11; 1 tick on January 13, and 1 tick on January 25. On January 3, incubated adults, also of subplot 785-A, were allowed to feed on three guinea pigs (Nos. 4884, 4885, and 4886), a snowshoe rabbit (No. 151), and a Belgian hare (No. 235). Definite infection resulted in all but guinea pig No. 4886. Incubated adults fed on a guinea pig on January 22 also transmitted the infection. Ten overwintered nymphs placed on guinea pig No. 5232 on March 10, 1924, transmitted fatal infection.

(1) PRODUCTION OF TULARÆMIA IN GUINEA PIGS BY INOCULATION OF UNFED ADULT TICKS COLLECTED IN NATURE.

EXPLANATORY NOTE: Adult *D. andersoni* are active during the spring and early summer, and unfed specimens may be collected by dragging an outing-flannel cloth over vegetation in infested areas. Such ticks are tested for Rocky Mountain spotted fever infection as follows: First by allowing them to feed for 2 days on a guinea pig, next by the inoculation of the same ticks into the same guinea pig 10 days later if no evidence of infection follows the feeding, and finally if a second interval of 10 days gives no evidence of infection, by an immunity test consisting of the injection of this same guinea pig with 1 c. c. of heart blood taken from a guinea pig at the height of infection. Groups of usually not to exceed 25 ticks are used for each test.<sup>1</sup>

LOT 2561.

May 19, 1923. Fifty ticks (lot 2561) were collected by dragging at the foot of a talus slope one-half mile up Roaring Lion Canyon, 6 miles southwest of Hamilton, Mont.

May 21. Twenty-five ticks were permitted to feed on guinea pig No. 3275, this pig dying on May 23. No autopsy was performed.

May 31. Eighteen of the above 25 ticks were inoculated into guinea pig No. 3414. Death occurred on the seventh day, the temperature for the preceding six days having been, 39.2, 40.2, 40.2, 41, 40, and 40.2. Necropsy: Right inguinal buboes, caseous, surrounding tissue hæmorrhagic; right pelvic gland and retropancreatic enlarged and caseous; spleen and liver enlarged and studded with numerous, small, discrete, necrotic foci. Diagnosis: Tularæmia.

<sup>1</sup>For further details not essential to this paper, see Spencer, R. R., and Parker, R. R., Rocky Mountain, Spotted Fever: Infectivity, of Fasting and Recently Fed Ticks. Pub. Health Rep., 88, 8, Feb. 23, 1923, pp. 333-339. (Reprint No. 817.)

June 7. Guinea pigs Nos. 3547 and 3548 were inoculated intraperitoneally and vaccinated,<sup>2</sup> respectively, with a spleen emulsion from guinea pig No. 3414. A Belgian hare was also inoculated. Guinea pig No. 3547 and the Belgian hare were dead on the morning of June 8 and were discarded. Guinea pig No. 3548 died June 11 and showed lesions suggestive of tularæmia.

From guinea pig No. 3547 infection was continued by vaccination and subcutaneous inoculation through four additional transfers to guinea pigs Nos. 2137 and 2138, death occurring in each instance, the last two guinea pigs dying on June 23.

Tubes of serum glucose cystine agar were inoculated June 23 from the spleen and inguinal bubo of guinea pig No. 2138. One of these cultures was subsequently used for the inoculation of guinea pigs Nos. 3945 and 3946 on which larval ticks of lot 785 were fed and were infected as shown by the subsequent nymphal feeding (see p. 1060) and the later recovery of *Bacterium tularensis* from the adult ticks by Francis (see p. 1067), the identity of the infection thus being demonstrated.

While lot 2561 was the only lot of ticks collected in nature in which the presence of *Bacterium tularensis* was actually demonstrated by culture, the possible presence of this organism in numerous other lots was indicated by the occurrence of typical or suggestive lesions of tularæmia in the guinea pigs into which they were inoculated in the course of routine tests for the presence in ticks of the infection of Rocky Mountain spotted fever. Some of these suspected lots consisted of unfed adults, some of fed adults (2 lots from Rocky Mountain goats, 1 from a horse), and some of fed nymphs (2 lots from Columbian ground squirrels, 1 from a mountain rat).

It is significant that the heart blood from a snowshoe rabbit also produced typical lesions of tularæmia in a guinea pig.

## (2) TRANSMISSION OF TULARÆMIA BY LABORATORY INFECTED TICKS.

EXPLANATORY NOTE: Under natural conditions *D. andersoni* seldom completes its cycle from egg to adult under two years; for example, starting in 1923 with an engorged female tick the eggs will be deposited and the larvæ feed that same season, the nymphs will appear in 1924 and the adults in 1925. Under laboratory conditions, however, ticks can be carried through this cycle in a few months, although we have never succeeded in rearing them through more than one generation within a calendar year. The history of such laboratory-reared ticks is accurately known and they are consequently valuable for experimental purposes. They are usually started from engorged female ticks collected under natural conditions. Such a lot (785) of laboratory-reared ticks was fed on tularæmia-infected guinea pigs as larvæ. As nymphs and adults they transmitted the infection to guinea pigs, Belgian hares and snowshoe rabbits and *Bacterium tularensis* was isolated from the adults. The history of this lot and other data relative thereto are given below.

<sup>2</sup> "Vaccinated" means that the shaved, abraded skin of the abdomen was rubbed with infected spleen tissue.

*History.*—This laboratory-reared lot of ticks was started from an engorged female collected from a horse on June 7, 1922. Eggs were deposited and the resultant larvæ fed on two normal Belgian hares beginning July 22. The nymphs were placed on Rocky Mountain spotted fever infected Belgian hares Nos. 67 and 68 on August 14. After molting to adults, the latter were kept in a refrigerator over winter. In April, 1923, a female tick completed engorgement on guinea pig No. 2725 and later deposited eggs. Smears of eggs proved negative for organisms resembling *Dermacentrozeus rickettsi*. Tests for spotted fever in these ticks were made in March and April, 1923, by feeding and inoculation into guinea pigs. These tests were all negative, and no evidence of other infection was found.

*Infection of larvæ with tularæmia.*<sup>3</sup>—On July 7, 1923, the larvæ which hatched from the eggs of the above female (larvæ of second laboratory generation) were placed on guinea pigs Nos. 3945 and 3946 immediately after they had been inoculated with a culture of *Bacterium tularense* isolated June 23, previously noted as secured from unfed adult ticks of lot 2561. The engorged larvæ were collected July 11 to 15. Both host guinea pigs died, one July 13, the other July 16. The necropsy findings were typical of tularæmia.

July 12. Twenty-five engorged larvæ were inoculated intraperitoneally into guinea pig No. 4009. This pig was killed and autopsied on July 30, but showed no evidence of infection.

*Transmission of tularæmia by the feeding of nymphs of lot 785.*—During August and September, 1923, part of the nymphs which molted from the engorged larvæ were fed in three separate lots on Belgian hare No. 195 (785-A), Belgian hare No. 207 (785-B), and Belgian hare No. 212 (785-C), the tick sublots being designated as indicated. Others were kept over winter, and in the spring of 1924 ten of these were fed on guinea pig No. 5232 (Sublot 785-J). The following are the data for these feedings.

SUBLOT 785-A.

August 21. This sublot was used to infest normal Belgian hare No. 195, the latter dying on the sixth day. The autopsy findings gave typical evidence of tularæmia. The following tests were made with engorged nymphs of this sublot.

<sup>3</sup> Infestation of guinea pigs and rabbits with larvæ or nymphs is accomplished by tying the prospective host and the loose ticks in a small muslin bag. This is then placed in a cage made of square mesh (2 meshes to the inch), heavy wire cloth. The cage and its contents are then placed within a framework stand so made that the bottom of the cage will rest several inches above the base of the stand. Just beneath the cage is a sheet of 4-mesh wire cloth which catches and holds the excreta. The stand and its contents are then placed in a larger canvas-bottomed bag and the latter is securely tied. The whole is then placed on three-eighth-inch iron rods 6 inches apart over a galvanized tray containing sawdust. This affords an opportunity for the urine to drain from the outer bag. The host is released from the inner bag at the end of 24 hours. The larvæ or nymphs, when engorged, drop from the host and fall through the meshes of the cage and the wire cloth beneath and are later collected from the bottom and sides of the outer bag.

August 28. Guinea pigs Nos. 4439 and 4451 were each inoculated intraperitoneally with the contents of 5 engorged nymphs. Both died on August 30 with lesions suggestive of tularæmia, but atypical, as, frequently occurs as the result of a more acute infection following inoculation instead of vaccination.

August 31. Normal Belgian hares Nos. 219 and 220 and guinea pigs Nos. 4469 and 4470 were each vaccinated with the contents of a single engorged nymph. The hares both succumbed on the fourth day, the two guinea pigs on the sixth, all with typical lesions of tularæmia.

SUBLOT 785-B.

August 29. The nymphs of this subplot were used to infest normal Belgian hare No. 207, which died on September 4 of typical tularæmia.

September 6. Five engorged nymphs were inoculated intraperitoneally into guinea pig No. 4487. Death from tularæmia occurred September 9.

SUBLOT 785-C.

September 5. The third subplot was placed on Belgian hare No. 212 for engorgement, the hare dying on the seventh day. The lesions were characteristic. Involvement of the neck glands was pronounced, doubtless because ticks usually feed on the head and neck.

September 12. Five engorged nymphs were inoculated intraperitoneally into guinea pig No. 4505, which died with typical lesions September 15.

SUBLOT 785-J.

The unfed nymphs of this subplot were kept over winter in a glass cylinder set in the ground.

March 10, 1924. Ten of these nymphs were secured on normal guinea pig No. 5232 by means of a brass gauze capsule. This guinea pig was dead on March 18 with typical lesions of glands, liver, and spleen. A transfer to guinea pig No. 5267 by the subcutaneous injection of a spleen emulsion resulted in death from typical tularæmia on the fifth day.

*Results.*—Fatal tularæmia in guinea pig No. 5232 following the feeding of ten unfed, over-wintered nymphs of subplot 785-J demonstrates the presence of infection in unfed nymphs 247 days after the ingestion of infected blood by the antecedent larvæ.

*Transmission of tularæmia by the feeding of adult ticks of subplot 785-A.*<sup>4</sup>—On December 12 four adult ticks of subplot 785-A, these ticks having first been incubated<sup>5</sup> for 48 hours at 37° C., were

<sup>4</sup> The ticks used in these experiments were confined in brass gauze capsules secured to the host by means of adhesive tape.

<sup>5</sup> The purpose of incubation was to induce winter feeding, recent experiments having indicated its value. Any effect which such incubation may have on the bacterium in the tick is doubtless comparable to that produced by the warm spring temperatures which precede the spring feeding of ticks which have hibernated.

placed on guinea pig No. 4788. All 4 ticks were feeding when removed on December 17. From December 17 to 23 these same ticks were permitted to feed on snowshoe rabbit No. 150, which died on the latter date.

Guinea pig No. 4788: This guinea pig appeared to be quite ill for several days before and after the removal of the ticks on December 17. It gradually improved, however, and on December 23 was killed and autopsied. The spleen was somewhat enlarged, but otherwise conditions did not appear abnormal. The spleen was forwarded to the Hygienic Laboratory, and 4 days later, on December 27, a portion was inoculated subcutaneously into 3 guinea pigs, causing the death of 2 of them January 7 and January 16, 1924, with typical subacute lesions of tularæmia.

Snowshoe rabbit No. 150: The liver and spleen of this snowshoe rabbit suggested that death had been due to tularæmia. A part of the spleen was used for transfers to guinea pigs Nos. 4850 and 4851, both of which died with definite lesions of tularæmia, the former on the fourth day, the latter on the fifth. The remainder of the spleen was forwarded to the Hygienic Laboratory and was inoculated subcutaneously by Francis into 3 guinea pigs on December 27, which was 4 days after removal from the rabbit. Of these pigs, one with enlarged inguinal glands was killed on January 3 and its tissues were transferred to 6 guinea pigs, all of which died between January 6 and 9 with typical lesions of tularæmia, from which cultures of *Bacterium tularensis* were obtained. Of the other two guinea pigs inoculated December 27, one was killed on January 7 and found with typical tularæmia; the second was well on February 27.

The presence of *Bacterium tularensis* in the ticks used in this experiment was demonstrated by inoculating their body contents, after emulsification in normal salt solution, subcutaneously into guinea pig No. 4878 on January 2. This guinea pig died on January 5 of typical tularæmia, and two guinea pigs to which the infection was transferred by spleen emulsion died in 3 and 4 days, respectively, their lesions also being typical.

*Results.*—The results of this experiment prove the transmission of nonfatal tularæmia to guinea pig No. 4788 by the feeding of infected adult ticks. Snowshoe rabbit No. 150 died of tularæmia at the end of six days, during which period it was infested with the same ticks which had infected guinea pig No. 4788; however, there is a remote possibility that snowshoe rabbit No. 150 might have derived its infection from another source, because on November 10, 37 days before the ticks were attached, this rabbit was vaccinated with the contents of an unfed adult tick of the known infected subplot 785-C. This rabbit did not at any time show evidence of infection following vaccination, as was also true of

another snowshoe rabbit vaccinated on the same date with an engorged nymph of the same subplot. This earlier test somewhat discounts this apparently successful transmission by adult tick feeding, although an incubation of 37 days is unknown in experimental tularæmia.

*Further tests.*—Further tests were made beginning January 3, 1924. As before, the ticks used had been kept in a refrigerator, but were removed and incubated at 37° C., this time for 72 hours. On January 3 one female was placed on snowshoe rabbit No. 151, one male and one female on guinea pigs Nos. 4884 and 4886, respectively, two females on guinea pig No. 4885, and one male and one female on Belgian hare No. 235.

In this series the snowshoe rabbit test was conclusive, snowshoe rabbit No. 151 dying on the sixth day, as did No. 150. The lesions also were identical in nature and apparent severity. A spleen emulsion was used to infect guinea pigs Nos. 4905 and 4906, vaccinated and inoculated subcutaneously, respectively; the former died in five days, the latter in six. Four more guinea pigs used for two further transfers all showed definite and characteristic lesions of tularæmia. As a control, the female tick which fed on this snowshoe rabbit was emulsified in normal salt and inoculated subcutaneously into guinea pig No. 4910 January 9, 1924, causing acute death from tularæmia on the fifth day. Two transfer guinea pigs died on the third and fourth days, respectively, both with pronounced and characteristic lesions.

Guinea pig No. 4884: This guinea pig on which a single male tick was placed had a small but definite enlargement of the inguinal glands on the morning of January 4, less than 18 hours after the placing of the capsule. Death occurred on January 9. The condition of the inguinal and pelvic glands was suggestive of tularæmia, but the spleen and liver were macroscopically negative. Transfers were made to three guinea pigs. No. 4804, inoculated with a spleen emulsion, died of typical tularæmia on January 17, and two guinea pigs to which the infection was transferred also succumbed. No. 4907, inoculated with bubo material, died January 16 with typical but subacute lesions; the latter, however, were acute in three guinea pigs used in two additional transfers. The third guinea pig died of pneumonia. On January 9 the tick which fed on guinea pig No. 4884 was inoculated subcutaneously into guinea pig No. 4909. Acute tularæmia resulted.

Guinea pig No. 4885: This pig appeared droopy for several days, this condition, however, gradually wearing off. On January 14, one of the females being about one-half engorged, the male tick from Belgian hare No. 235 was placed with it in order that fertilization might take place. On January 21, the female having completed

engorgement, the ticks were removed. All were attached, but the second female showed no evidence of feeding. When the engorged female was removed, necrotic tissue from the site of attachment remained clinging to the mouth parts. The surrounding tissue was edematous and of darkened color. The host, however, showed no other evidence of possible infection. On January 22 it was killed and autopsied. The spleen was normal in size, although dark in color. The inguinal glands were slightly enlarged. There was no condition, however, that was particularly suggestive of tularæmia. Nevertheless, transfers to two guinea pigs by means of a mixed emulsion of the spleen and the enlarged inguinal glands resulted in acute death with typical lesions of this infection. A further transfer gave the same result. The engorged female from this guinea pig was saved for egg deposition. On January 25 the male and the unengorged female were each inoculated subcutaneously into guinea pigs. The inoculation of the former caused typical tularæmia and death on the third day. The results of the inoculation of the latter were indefinite and transfers were not made because of the positive results with the male.

Guinea pig No. 4886: While it at first appeared as if the result of tick feeding on this guinea pig was positive, an apparently different infection developed in the transfer guinea pigs and the test has been considered valueless.

Belgian hare No. 235: A male and female tick were placed on this hare. On January 11, eight days after tick attachment, 1 c.c. of heart blood was transferred subcutaneously to guinea pig No. 4914. On January 21, no evidence of illness having developed, this guinea pig was killed and autopsied. Except for an enlarged spleen the tissues appeared normal. A guinea pig inoculated subcutaneously with a spleen emulsion died in 5 days with more suggestive lesions. Two guinea pigs used for an additional transfer, one vaccinated, the other injected subcutaneously with a mixed emulsion of the spleen and pelvic gland, died on the fifth and third days, respectively, both with typical lesions of glands, spleen, and liver. Aside from a loss of weight, the Belgian hare has shown no evidence of sickness.

*Results.*—The results of this series prove (1) the transmission of fatal tularæmia to snowshoe rabbit No. 151 by the feeding of a single infected female *Dermacentor andersoni* (this is especially significant because this rodent is a normal host of this wood tick in nature); (2) the transmission of fatal tularæmia to guinea pig No. 4884 by the feeding of a single infected male *Dermacentor andersoni*; (3) the transmission of tularæmia to guinea pig No. 4885 (killed on the nineteenth day) by the feeding of two females and one male infected *Dermacentor andersoni*; (4) the transmission of nonfatal tularæmia to Belgian



hare No. 235 by the feeding of one male and one female infected *Dermacentor andersoni*.

Besides the above tests made by Parker at the field station at Hamilton, Mont., positive results were also secured with adult ticks of subplot 785-A by Spencer and Francis at the Hygienic Laboratory, Washington, D. C., as follows:

Guinea pig A: On January 22, 1924, six adult ticks of subplot 785-A, which had been incubated for 24 hours at 37° C. were placed in capsule on guinea pig A. When removed January 28 two were but slightly attached and none had fed more than slightly. On February 2 this guinea pig was in a dying condition. It was killed and autopsied. The spleen, liver, and glands were typical of tularæmia. The area on which the ticks were attached, about 1 inch in diameter, was edematous, very dark, and the skin thickened. The heart blood was cultured and *Bacterium tularensis* was recovered February 4. The spleen and glands were vaccinated on a guinea pig, which was dead on February 7 with very typical lesions.

Guinea pig B: On January 28 six ticks were transferred from guinea pig A to guinea pig B, which died February 6 with very typical lesions of tularæmia in spleen, liver, and lymphatic glands. As in guinea pig, A, the skin was thickened, dark and edematous in an area about 1 inch in diameter at the site of the bites, but there was no inflammation of the peritoneum beneath. Cultures of heart blood were positive for *Bacterium tularensis* February 8. Dried tick feces collected from the capsule were injected subcutaneously into a guinea pig, which on February 11 was dead with typical lesions of tularæmia in spleen, liver, and lymphatic glands. Five ticks had fed slightly. One tick was dead; this was injected subcutaneously into a guinea pig, which was still well March 5.

Guinea pig C: On February 6 the 5 living ticks were transferred from guinea pig B to guinea pig C in capsule on the abdomino-thoracic region. Guinea pig died on February 13 with typical spleen and liver; all lymphatic glands were typical except the inguinals, which appeared normal. One tick was dead; this was injected subcutaneously into a guinea pig, which was dead February 21 with very typical lesions of tularæmia. Four ticks were living and were slightly engorged.

Guinea pig D: On February 13 three female ticks and one male tick were transferred from guinea pig C to guinea pig D in capsule on the abdomino-thoracic region. Guinea pig D died February 21; the spleen and liver were very typical. The typical glands were the right retroscapular, right axillary, substernals, and retropancreatic; all other lymph glands appeared negative. Cultures of heart blood were positive for *Bacterium tularensis* February 23. The male tick was completely fed and dead, and was injected subcutaneously into

two guinea pigs, one of which was sick February 23 and was killed, showing very typical lesions of spleen, liver, and lymph glands; the other guinea pig was dead February 24 and was typical throughout. One female tick was dead and was injected subcutaneously into a guinea pig, which on March 5 was still well. Two females were living and slightly engorged; these were combined in capsule with 7 unfed adults of subplot 785-A and transferred to guinea pig E.

*Results.*—(1) Fatal tularæmia occurring in guinea pig A following the feeding of 6 unfed adults of subplot 785-A shows transmission of infection from larvæ to adult ticks of the same generation and the presence of infection in those unfed adults 199 days after the ingestion of infected blood by the larvæ, and 154 days after causing fatal tularæmia in Belgian hare No. 195 by nymphal feeding. (2) The data also show the transmission of tularæmia, by feeding, by the above adults in a series of four guinea pigs, the interval elapsing between removal of the ticks from infected guinea pig and their application to a healthy guinea pig of the series being only a few minutes.

LOT 1988-C.

This lot of laboratory-reared ticks began with an engorged female collected from a cow "down with ticks"<sup>6</sup> on May 15, 1923. On July 16 the resultant larvæ were placed on guinea pigs Nos. 4064 and 4065, both of which were inoculated subcutaneously on this same date with a culture of *Bacterium tularensis*. On July 24, the larval engorgement having been completed, the host guinea pigs were killed and autopsied. The findings were indefinite. On July 23, guinea pig No. 4150 was inoculated intraperitoneally with 25 engorged larvæ; and when killed and autopsied on August 9, no evidence of infection was observed. On January 12, 1924, guinea pig No. 4925 was inoculated subcutaneously with 12 flat nymphs which had been incubated for 20 hours at 37° C.; death from typical tularæmia resulted on January 26.

*Results.*—Fatal tularæmia occurring in a guinea pig after subcutaneous inoculation with flat nymphs of lot 1988-C shows transmission of infection from larvæ to nymphs and the presence of infection in the latter 180 days after the infection of the larvæ.

LOT 1988-G.

The engorged female with which lot 1988-G was started was secured from the same host as that used to begin lot 1988-C. On July 23, normal Belgian hare No. 140 was vaccinated with a culture of *Bacterium tularensis* and infested with larvæ of the above female

<sup>6</sup> "Down with ticks" is a local designation for a condition of unknown etiology which occasionally occurs in tick-infested cattle. The animal is found lying down and unable to rise. If the ticks are removed and the animal is given proper care, recovery usually follows.

tick. This hare was killed and autopsied on July 30 but did not show lesions indicative of tularæmia. As flat nymphs, some of this lot (sublot 1988-G(A)) were fed on normal Belgian hare No. 202, beginning August 24. After engorgement of the nymphs the hare was killed, but no autopsy was made. Immediately following the larval feeding, 25 engorged larvæ were tested by intraperitoneal inoculation into a guinea pig; and following the nymphal feeding, 5 engorged nymphs were similarly tested. In neither instance was evidence of infection found, but further transfers were not made. On January 11, 1924, two unfed adults, direct from the refrigerator, were emulsified and injected subcutaneously into guinea pig No. 4915. When killed and autopsied on January 28 a slightly abnormal condition of the spleen was the only indication of possible infection. On January 12, two adults which had been incubated at 37° C. for 20 hours were injected subcutaneously into guinea pig No. 4924. This test resulted in typical tularæmia, death occurring on January 25.

*Results.*—The production of fatal tularæmia in a guinea pig after subcutaneous inoculation with the unfed adults of sublot 1988-G(A) shows transmission of infection from larval to adult ticks of the same generation and the presence of infection in unfed adults 172 days after the ingestion of infected blood by the larvæ.

### (3) ISOLATION OF BACTERIUM TULARENSE FROM ADULT TICKS OF SUBLOT 785-A.

Sublot 785-A, which fed, July 7, as larvæ on infected guinea pigs Nos. 3945 and 3946, and which fed as nymphs, August 21, on a healthy Belgian hare, No. 195, causing the death of the latter with typical lesions of tularæmia, were tested for infectivity September 15, October 15, November 15, and December 15 by injection of a macerated tick subcutaneously into guinea pigs. The guinea pigs all died acutely showing typical lesions of tularæmia. The infection produced in guinea pigs by the injection of September 15 was transferred for several generations in a series of 18 guinea pigs, 4 rabbits, and 14 white mice, all of which died acutely with typical lesions of tularæmia. The heart blood, spleen, or liver of these animals was cultured, either soon after death or after the animal had been killed in the dying hours, upon slants of the following mediums:

(a) *Coagulated egg yolk.*—The heart blood of 10 guinea pigs was planted, of which 1 showed growth at the end of 48 hours, 2 showed growth after 72 hours, and 7 remained negative. The heart blood of 4 rabbits was planted, of which 2 showed growth at the end of 48 hours and 2 remained negative. The heart blood of 13 white mice was planted, all of which showed growth at the end of 48 hours except, 1, which showed growth at the end of 72 hours.

(b) *Serum glucose cystine agar*.—The heart blood of 15 guinea pigs was planted, all of which showed growth after an average of 7 days. The heart blood of 4 rabbits all grew after an average of 7 days. The heart blood of 12 mice all grew after an average of slightly less than 3 days. Cultures of 2 guinea-pig livers showed growth after 6 days and 13 days, respectively. Cultures of 5 guinea-pig spleens showed growth after an average of 5 days.

(c) *Serum glucose cysteine hydrochloride agar*.—The heart blood of 15 guinea pigs was planted, all of which showed growth after an average of 7 days. The heart blood of each of 4 rabbits grew after an average of 6 days. The heart blood of 1 mouse showed no growth, while the heart blood of 11 mice all grew after an average of 3 days. Cultures of 2 guinea-pig livers showed growth after 5 days and 13 days, respectively. Cultures of 5 guinea-pig spleens showed growth after an average of 6 days.

(d) *Plain agar slants and fermentation tubes of glucose bouillon*.—These all remained sterile.

*Identification of tick strain*.—One of the above cultures was compared with three strains of *Bacterium tularensis* carried in stock in the Hygienic Laboratory; one of these strains is of human origin and was obtained from Utah; one is of ground-squirrel origin and was obtained from California; the other is of rabbit origin and was obtained from Washington (D. C.) market. The cultural and morphologic characteristics, fermentation reactions, and gross lesions produced in guinea pigs, rabbits, and white mice were the same for the four strains. The tick strain, moreover, was agglutinated in high dilution by human and animal serums collected after recovery from infection with the Utah human strain and the Washington (D. C.) rabbit strain.

#### (4) SUSCEPTIBILITY OF THE WOODCHUCK, *MARMOTA FLAVIVENTER*.

On December 28 woodchuck No. 4 was inoculated subcutaneously with a liver emulsion from tularæmia guinea pig No. 4850, a first transfer guinea pig from snowshoe rabbit No. 150, infection in the latter having been demonstrated by guinea-pig inoculation and the isolation of *Bacterium tularensis* by Francis from a transfer guinea pig (see p. 1062).

This woodchuck died on January 2, 1924, with lesions definitely characteristic of tularæmia. Typical infection occurred in each of 6 guinea pigs used for 3 transfers at the Hamilton (Mont.) Laboratory, and the results were further verified by transfers made by Francis at the Hygienic Laboratory.

#### DERMACENTOR ANDERSONI AS A POSSIBLE FACTOR IN THE TRANSMISSION AND MAINTENANCE OF TULARÆMIA IN NATURE.

The data for lots 785, 1988-G, and 1988-C clearly demonstrate that larval *D. andersoni* may become infected with *Bacterium*

*tularensis* by ingesting the blood of an infected host and that infection acquired by larvæ (and doubtless by nymphs) can be passed on to the adult ticks of the same generation. These data are not conclusive, however, as regards similar stage to stage transmission under natural conditions. This is because under the experimental conditions the period from larval engorgement to adult ticks was less than 3 months, whereas under natural conditions there is a minimum overwinter period of at least 6 to 7 months between the larval and nymphal feedings and again between those of nymphs and adults, while the total time from larval feeding to adult feeding would normally be from 18 to at least 21 months. These data are, nevertheless, strongly suggestive; for flat nymphs of lot 1988-C were shown to contain the infection on January 12, 1924, the larval feeding having begun July 16, 1923, and flat nymphs of subplot 785-J transmitted the infection on March 10, 1924, the infective larval feed having begun on July 7, 1923. Furthermore, adults of subplot 785-A and subplot 1988-G (A) were shown to be infected on January 22 and January 12, 1924, respectively, the respective nymphal feedings having commenced on August 21 and August 24, 1923. At the present time, therefore, the survival of *Bacterium tularensis* in unfed nymphs of two separately infected lots has been demonstrated under laboratory conditions for periods of 6 and 8 months, respectively (lots 1988-C and 785-J), and in unfed adults for 5 months (sublots 785-A and 1988-G (A)). These experimental data, moreover, are supplemented by the definite recovery of *Bacterium tularensis* from the unfed adults of lot 2561, collected from nature May 19, 1923. Lot 2561 could not have acquired infection subsequent to the nymphal feeding, which could not have occurred later than the summer of 1922, thus showing an overwinter survival of the bacterium in unfed adult ticks for a period of at least 8 months. In view of this fact and the experimental evidence, it can scarcely be doubted that stage to stage transmission actually takes place in this tick under natural conditions.

Transmission of tularæmia to susceptible animals (one of them the snowshoe rabbit, being a natural host of *D. andersoni*) by the feeding of nymphs and adults which were infected as larvæ has been amply demonstrated by the experiments with the nymphs of lot 785 and the adults of subplot 785-A. Single adults were able to transmit the infection.

There is, then strong evidence to indicate that, in nature, the larvæ and nymphs of *D. andersoni* may become infected with *Bacterium tularensis* by ingesting the blood of an infected host, that infection thus acquired can be transmitted to subsequent stages of the same generation, and that these subsequent stages can transmit

the infection to susceptible hosts upon which they may feed. Experiments to determine whether infection present in engorged females can be transmitted through the egg to the larvæ of the next generation are now in progress.

However, since the larva, the nymph, and the adult of *D. andersoni* each feeds on a separate host, transmission from female to progeny is not necessary in order that this tick may be a factor in the natural maintenance of tularæmia. But it is necessary that the tick come into contact with susceptible animals. That such contact occurs must follow from the fact that the infection was recovered from the unfed adult ticks of lot 2561, collected from nature. But even without this evidence the known host relationships of the tick make such contacts certain, since jack, snowshoe, and cottontail rabbits and woodchucks, all known to be susceptible, are important tick hosts. Woodchucks are especially good nymphal hosts. Cottontail rabbits carry both larvæ and nymphs. Jack and snowshoe rabbits are infested by all stages, but particularly by the nymphs and adults, the latter being especially numerous on the jack rabbits. These points of contact between the tick and known susceptible rodents, therefore, complete the chain of evidence necessary to indicate that *D. andersoni* is a possible factor in the natural transmission and maintenance of tularæmia in sections of the United States in which this tick occurs (region of the Rocky Mountains) and in which the infection and the necessary hosts are also present.

It should be stated, however, that wild mammals other than those mentioned may also be concerned. As regards other rodents, of those known to be susceptible—the ground squirrels *Citellus beecheyi*,<sup>7</sup> *C. mollis*,<sup>8</sup> and *Ammospermophilus leucurus*<sup>9</sup>—data are lacking concerning their relationship to the tick, and of those known to be hosts of the tick, data are lacking as regards susceptibility. Of the large mammals—Rocky Mountain goats, elk, deer, coyotes, horses, cattle, sheep, domestic goats, etc., which are the principal adult tick hosts—none is known to be susceptible with the possible exception of the sheep.<sup>10</sup>

The discussion has thus far been confined to the probable transmission of tularæmia in nature by tick feeding. It has been established by Francis and Lake,<sup>11</sup> however, that a susceptible animal can infect itself by the ingestion of infected parasites. Although our

<sup>7</sup> McCoy, George W.: A plague-like disease of rodents. Pub. Health Bull. No. 43. April, 1911.

<sup>8</sup> Francis, Edward: Occurrence of tularæmia in nature as a disease of man. Pub. Health Rep., 36, July, 29, 1921, pp. 1731-1738. Reprinted in Hyg. Lab. Bull. No. 130.

<sup>9</sup> McCoy, George W., and Chapin, Charles W.: Further observations on a plague-like disease of rodents, with a preliminary note on the causative agent, *Bacterium tularense*. Jour. of Infect Dis., 10, 1, January, 1912, pp. 61-72.

<sup>10</sup> McCoy, George W., and Chapin, Charles W., loc. cit.

<sup>11</sup> Francis, Edward, and Lake, G. C.: Transmission of tularæmia by the bedbug, *Cimex lectularius*. Pub. Health Rep., 37, Jan. 20, 1922, pp. 83-95. Reprinted in Hyg. Lab. Bull. No. 130.

observations indicate that the ingestion of ticks by rodents, if it occurs at all, would be an infrequent occurrence of an accidental nature, the existence of this possible mode of infection should be noted.

OTHER TICKS OCCURRING IN THE BITTERROOT VALLEY AS POSSIBLE FACTORS IN THE MAINTENANCE OF TULARÆMIA.

*Dermacentor albipictus* Packard.—*D. albipictus*, the so-called horse, elk, or winter tick, is a one-host tick and is known to occur only on large mammals (horses, elk, deer, and Rocky Mountain goats), which are not known to be susceptible to tularæmia. During the seasons of 1922 and 1923, 645 ticks of this species were inoculated intraperitoneally into 42 guinea pigs. No evidence of tularæmia resulted, although 10 tests were rendered valueless by intercurrent infection or other causes.

*Ixodes* spp.—Several species of *Ixodes* are present in the Bitterroot Valley. Tests by intraperitoneal inoculation have never produced any lesions suggestive of tularæmia.

*Hæmaphysalis leporis-palustris* Packard (rabbit tick).—Because of the country-wide distribution of this tick, its occurrence on all species of rabbits, often in great numbers (several hundred to the individual), and the widespread occurrence of tularæmia in jack and cottontail rabbits as shown by Francis<sup>12</sup> the possibility that this tick may be capable of transmitting the infection is a point of some importance.

During the seasons of 1922 and 1923 a total of 3,867 rabbit ticks from 70 snowshoe and cottontail rabbits were inoculated intraperitoneally into 81 guinea pigs, as routine procedure in tests for Rocky Mountain spotted fever infection. Of these tests, 24 (an unusually high percentage) proved valueless because of intercurrent infection. We do not know, unfortunately, to what extent, if any, tularæmia may have been responsible.

In the hope that definite data might be secured, a Belgian hare, No. 222, was vaccinated on September 5, 1923, with an engorged nymph of infected subplot 785-B (*D. andersoni*), and at the same time infested with rabbit tick larvæ of lot 2593-1 (hatched from eggs deposited by a female taken from a snowshoe rabbit on May 28). This hare died on September 13 with pronounced and typical lesions. On September 14 five of the engorged rabbit-tick larvæ were inoculated intraperitoneally into guinea pig No. 4525, which died 2 days later with typical lesions of tularæmia, thus demonstrating the presence of the bacterium in the recently engorged larvæ. On October 25, guinea pig No. 4627 was vaccinated with a single

<sup>12</sup> Francis, Edward, loc. cit.; and also, Tularæmia in the Washington (D. C.) Market. Pub. Health Rep., 38, June 22, 1923, pp. 1391-1396.

engorged larva from the refrigerator. Acute death from typical tularæmia occurred on the sixth day, and *Bacterium tularensis* was recovered from the spleen by Francis. On November 28, guinea pig No. 4741 was similarly vaccinated. This guinea pig was killed and autopsied on December 19. A spleen twice enlarged was the only evidence of possible infection; the spleen was removed and, 8 days later, on December 27, was used by Francis to inoculate 3 guinea pigs subcutaneously. One of these guinea pigs died January 26, 1924, of typical tularæmia; one died January 6, the lesions becoming typical in a transfer pig which died January 27. The third guinea pig was still well on February 29. On December 28 a larva which had been incubated for 24 hours at 37° C. (previously kept outdoors and frozen) was injected subcutaneously into guinea pig No. 4861. Death occurred January 2, 1924. Typical lesions and acute death in 4 to 6 days resulted in 4 guinea pigs used for two subsequent transfers. These tests have demonstrated infection in engorged rabbit-tick larvæ 114 days after the infective feeding and comprise the total of present evidence against this tick.

#### D. ANDERSONI AS A POSSIBLE AGENT OF HUMAN INFECTION WITH TULARÆMIA.

It has been shown that infection with *Bacterium tularensis* which is acquired by immature ticks can be passed on to adult ticks of the same generation; also that unfed adult ticks collected in the field contained organisms virulent for guinea pigs, the infection having survived the winter in the body of the tick. Since the adult tick is a frequent accidental parasite of man (nymphs are occasionally found on young children), the question of human infection through its agency is suggested. This will certainly depend to some extent on the virulence of the bacterium for man after its long residence in the tick. Data relative to this question consist of reports from physicians of cases of prostration, fever, and glandular involvement following tick bites, without specific information as to the exciting cause; such cases are now being investigated.

#### SUMMARY.

1. The occurrence of tularæmia in the Bitterroot Valley in western Montana has been demonstrated by the recovery of *Bacterium tularensis* from ticks of the species *Dermacentor andersoni*, collected from nature.

2. Virulent organisms were recovered from unfed adult ticks collected May 19, 1923. Since infection must have been acquired from an infected host by an antecedent stage, which could not have fed later than the summer of 1922, overwinter survival in the tick during a period of at least 8 months is indicated.



3. Larvæ of *D. andersoni* (the progeny of one female) were infected with *Bacterium tularensense* by permitting them to engorge on infected guinea pigs. Under laboratory conditions these ticks were reared to the adult stage in less than three months. Three nymphal sublots infected the hosts upon which they were placed for engorgement. From the adults, infection was repeatedly recovered by subcutaneous injection or intraperitoneal inoculation into guinea pigs and successful transmission by the feeding of the adult ticks was secured in 4 of 5 trials begun on January 3, 1924, and in a further test made January 22, the last test demonstrating the presence of the infection in these ticks 199 days after the infecting larval feed or 154 days after the nymphal feed. From another lot of adults, also infected as larvæ, infection was recovered by subcutaneous injection into a guinea pig 172 days after the infecting feed. From a lot of nymphs infected as larvæ, infection was similarly recovered 180 days after infection; and from another lot also infected as larvæ, infection was recovered by feeding 247 days after infection.

4. Snowshoe rabbits (*Lepus bairdi*) and woodchucks (*Marmota flaviventer*) have been shown to be susceptible to tularæmia.

5. Jack, snowshoe, and cottontail rabbits and woodchucks, all known to be susceptible to tularæmia, are important hosts of *D. andersoni*. The above rabbits are also hosts of the rabbit tick, *Hæmaphysalis leporis-palustris*, the engorged larvæ of which have been shown to contain virulent *Bacterium tularensense* 114 days after the infective larval feeding. Actual stage to stage transmission, however, has not yet been established as occurring in this tick.

6. It is probable that *D. andersoni* is a factor in the maintenance of tularæmia, because (1) infection acquired by immature ticks can be passed on to subsequent stages of the same generation, (2) nymphs and adults are able to transmit infection by feeding, (3) *Bacterium tularensense* is able to survive in the tick during hibernation, and (4) the tick infests rodent hosts known to be susceptible.

7. It is likely that some of the adults of *D. andersoni* which feed on man are infected with *Bacterium tularensense*. There is as yet no definite evidence, however, to indicate what part this tick may play in human infection.

## REPORT OF A CASE OF *DIBOTHRIOCEPHALUS LATUS* (*DIPHYLLOBOTHRIMUM LATUM*).

By T. B. H. ANDERSON, Surgeon, United States Public Health Service.

The following report of a case of infection by *Dibothriocephalus latus* (*Diphyllobothrium latum*), or broad Russian tapeworm, is made because of its relatively rare occurrence in this country. The patient, F. R., 31 years of age, a native of Sweden, for the last 10 years a seaman in the United States Merchant Marine, was admitted to United States Marine Hospital No. 9, Fort Stanton, N. Mex., September 18, 1923, having been transferred from United States Marine Hospital No. 21, Stapleton, N. Y. The diagnosis on admission was tuberculosis, pulmonary, chronic, active, far advanced. The entire left lung and middle and lower lobes of the right lung were involved, with a large cavity in the right base.

The patient had been ill since December, 1922, having had an acute respiratory attack at that time. He sought hospital care in June, 1923, and was admitted to hospital at Stapleton, N. Y., June 16, 1923.

A fecal examination made on admission at this hospital was reported as negative for ova. In November the patient complained to the ward surgeon of passing segments of tapeworm. A fecal examination was made on November 20, and large numbers of ova were found. The patient was treated on November 24 with oleoresin aspidium. After the usual preliminary preparation, a moderate dose of the drug was given and the worm was expelled. The expelled portion was carefully examined, but its head was not found. The patient was not treated again at this time because of his poor physical condition. Fecal examinations made December 26, 1923, and January 29, 1924, were both negative for ova. A blood examination was made December 8, 1923, showing only a mild anemia, and slight leucocytosis.

This patient never improved from the time of his admission to the hospital, and the expulsion of the tapeworm did not cause any noticeable change in his condition. He developed a septic pneumonia on February 29, 1924, and died March 2, 1924.

As *Dibothriocephalus latus* (*Diphyllobothrium latum*) is a frequent parasite in Scandinavia, it is very likely that this patient was infected in early life. However, this case demonstrates very forcibly the possible spread of this very dangerous parasite in this country through immigrants coming from Scandinavia, Switzerland, Bavaria, and Russia.

## SCHOOL MEDICAL INSPECTION IN HAGERSTOWN AND WASHINGTON COUNTY, MARYLAND.<sup>1</sup>

By C. V. AXIN, Surgeon, United States Public Health Service, Medical Officer in Charge.

### FOREWORD.

The existing system of school medical inspection and the related activities incident to school health work were inaugurated in 1921, with the assignment of a physician and one assistant by the United States Public Health Service.

This personnel was attached to the Washington County health demonstration, a cooperative effort undertaken jointly by the State Department of Health of Maryland, the United States Public Health Service, the Johns Hopkins School of Hygiene, and the Washington County Public Health Association.

During the period from December, 1921, to September, 1922, the following activities were being carried on:

(1) Physical examination of all children in the first and second grades of the Hagerstown public schools. Approximately 1,500 children were inspected.

(2) Follow-up to secure correction of defects.

(3) Monthly census of all Hagerstown school children (approximately 6,000) to determine causes and rates of morbidity resulting in absenteeism.

(4) A limited oral hygiene survey, with demonstrations during May and June, 1922.

(5) Nutrition work among mal-nourished children identified through school medical inspection. Nutrition classes were organized, and through lectures and demonstrations a widespread interest in the subject was created in all sections of Washington County.

As the work increased and the need for this type of child health work became better understood in the community the scope of child hygiene activities was greatly extended.

In September, 1922, a commissioned officer of the Public Health Service was assigned to Hagerstown, with instructions to develop a practicable program of school inspection and, within the limits of the group handled, to undertake certain investigations of the problems of child health as related to children of school age.

This summary deals particularly with the accomplishments of the school year, September, 1922, to June, 1923.

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<sup>1</sup> From the Annual Report of the Public Schools of Washington County, Maryland, for the School Year Ending July 31, 1923. Issued by the Washington County Board of Education, November, 1923.

PERSONNEL.

- (1) A commissioned officer of the Public Health Service in administrative charge.
- (2) A physician experienced in school physical examinations.
- (3) A trained school hygiene nurse.
- (4) A nutrition worker.
- (5) A technical assistant for the investigation of special problems in physical and mental health.
- (6) A physician to perform special measurements in connection with special studies in the physical development of American children.
- (7) A record clerk.

ACTIVITIES.

SCHOOL MEDICAL INSPECTION.

The original group of 1,500 children, first examined during the last school session, were reexamined. The majority of this group were in the second and third grades.

In addition to these, children in the first and fourth grades were given physical examination, making in all grades a total of 2,951.

The present program contemplates keeping this group under continued observation over a period of several years.

Incoming first-grade children will be examined each year.

Each child was given a complete physical examination, special attention being paid to eyes, ears, nose, throat, mouth, and chest, and muscular and osseous systems.

In evidence of the necessity for routine physical inspection, it should be stated that only 85 children out of a total of 2,951 were without recognizable defects.

Among outstanding deficiencies the following were noted:

	Per cent.
Vision defects.....	31. 00
Serious.....	12. 43
Minor.....	18. 57
Hearing defects.....	2. 90
Nasal obstruction.....	20. 80
Tonsils defective.....	59. 70
Teeth defective.....	88. 76
Parasitic infections.....	4. 30
Enlarged thyroids.....	6. 33
Organic heart lesions.....	2. 58
Malnutrition.....	17. 00

Other defects occurring with significant frequency are improper posture and orthopedic deformity; functional irregularities of the heart; and oral sepsis.

## CORRECTION OF DEFECTS FOUND AT EXAMINATION.

On completion of examination, all children are immediately divided into two groups on the basis of physical findings:

- (1) Children with significant defects.
- (2) Children with relatively minor defects.

The systems of follow-up for correction of defects are applied as indicated below.

Four types of follow up were undertaken with considerable success, namely—

(a) Visits by district nurse to home of each child with "significant" defect.

(b) Written notification of parent in case of child with minor defect.

(c) "Health scores" posted in each classroom, showing physical record of each child by means of stars and symbols. (Nonremediable defects are not included in this record.)

(d) Utilization of the classroom teacher as one of the most important factors in securing corrective work.

During the school year 1921-22 a total of 1,377 corrections were secured. Chief among these in number and in importance were the following:

	Number.
Glasses fitted and eye inflammations improved.....	176
Impacted wax, affecting hearing, removed.....	35
Adenoids and other nasal obstructions removed.....	70
Tonsils removed and inflamed throats improved.....	170
Dental corrections (complete).....	242
Parasitic conditions corrected.....	120
Vaccinations against smallpox.....	218
Children restored to proper weight.....	217
Braces applied to orthopedic deformities.....	12

NOTE: Home visits were made by the district nurses of the Washington County Health Demonstration. One thousand two hundred and sixty-five cases were referred to the nursing service, an average of four calls being paid in each case.

## CONTROL OF COMMUNICABLE DISEASES.

The control of communicable diseases and contagious conditions among school children in Hagerstown rests principally on the prompt exclusion of home contacts with known cases.

The following instances of exclusion are typical:

(a) All children residing in a home where a case of communicable disease occurs. The home quarantine procedure is under the direction of the county health officer, who, by arrangement, reports all cases placarded each day to the office of the school medical inspector. A list of such cases, giving name, age, address, and diagnosis, is placed in the hands of each school principal before the opening of school the following morning. Any child found in school from a listed

address is immediately sent home and is not permitted to enter school until the case has recovered and all necessary control measures have been effected in the instance of the well contact.

(b) Children with contagious (parasitic, etc.) conditions recognized at the time of physical examination.

(c) Children with positive nose or throat cultures detected in a classroom after the occurrence of a case of diphtheria in the school, or children with an elevation of temperature, desquamation, etc., after the occurrence of scarlet fever among members of a class.

Any child remaining out of school for five days or longer from any cause whatever can not be returned to school prior to the presentation of a proper medical certificate.

#### PERIODIC WEIGHING OF CHILDREN THROUGHOUT THE SCHOOL GROUP.

The regular monthly weighing of all children in the Hagerstown schools was made possible by a generous gift of a set of standard scales for each of the 9 schools. When the need for scales was presented publicly, the Hagerstown Kiwanis Club promptly assumed the entire expense. The whole program of medical inspection and scientific investigation would have been handicapped had it not been for this contribution.

During the session 1922-23 the classroom teachers weighed children at intervals of one month, the findings being recorded on weight charts prepared for each room. This procedure served most effectively to interest the teachers in their children as individual physical units and stimulated among the children a high regard for physical advancement.

#### SUPPLEMENTARY ACTIVITIES.

As a direct result of the investigations conducted by the school medical inspector during the session 1921-22, the Women's Civic League of Hagerstown instituted a system of milk distribution in certain local schools.

Through the agency of this organization, milk of the highest sanitary quality was made available at the rate of 3 cents per half pint. Inability to pay for milk did not deprive indigent children of its benefits, as the Civic League furnished milk without cost to deserving cases.

In further evidence of cooperation, members of the Civic League personally attended to the distribution in schools.

No statement regarding school health work in Washington County would be complete if lacking some mention of the valuable cooperation and assistance freely and continuously given by the school authorities.

## STUDIES ON OXIDATION-REDUCTION—A CORRECTION.

In the article entitled Studies on Oxidation-Reduction—A Preliminary Study of Indophenols, published in Public Health Reports April 18, 1924, the numbering of the pH divisions along the abscissa axis of Figure 1, page 806, was incorrect, each number being one unit too low. Thus, instead of pH 5, 6, 7, 8, etc., it should have been pH 6, 7, 8, 9, etc. This error, which will be corrected in the reprint of the article, in no way alters the comments found in the text.

### DEATHS DURING WEEK ENDED APRIL 19, 1924.

*Summary of information received by telegraph from industrial insurance companies for week ended April 19, 1924, and corresponding week of 1923. (From the Weekly Health Index, April 22, 1924, issued by the Bureau of the Census, Department of Commerce.)*

	Week ended April 19, 1924.	Corresponding week, 1923.
Policies in force.....	57, 297, 605	53, 122, 035
Number of death claims.....	10, 951	11, 441
Death claims per 1,000 policies in force, annual rate..	10. 0	11. 2

*Deaths from all causes in certain large cities of the United States during the week ended April 19, 1924, infant mortality, annual death rate, and comparison with corresponding week of 1923. (From the Weekly Health Index, April 22, 1924, issued by the Bureau of the Census, Department of Commerce.)*

City.	Week ended Apr 19, 1924.		Annual death rate per 1,000, corre- sponding week, 1923.	Deaths under 1 year.		Infant mortal- ity rate, week ended Apr. 19, 1924. <sup>2</sup>
	Total deaths.	Death rate. <sup>1</sup>		Week ended Apr. 19, 1924.	Corre- sponding week, 1923.	
Total (65 cities).....	7, 285	14. 0	<sup>3</sup> 13. 9	945	<sup>3</sup> 882	-----
Akron.....	40			5	7	53
Albany.....	43	18. 9	17. 8	5	3	110
Atlanta.....	83	19. 0	18. 9	6	5	-----
Baltimore.....	210	14. 0	16. 4	16	34	46
Birmingham.....	65	16. 9	14. 4	9	9	-----
Boston.....	248	16. 6	16. 5	31	43	86
Bridgeport.....	37			2	8	31
Buffalo.....	153	14. 6	14. 9	30	23	127
Cambridge.....	29	13. 5	15. 9	3	4	52
Camden.....	44	18. 2	13. 0	9	4	142
Chicago.....	705	12. 5	13. 0	104	90	96
Cincinnati.....	141	18. 0	16. 9	10	11	63
Cleveland.....	213	12. 2	11. 3	24	24	63
Columbus.....	74	14. 5	16. 8	11	9	105
Dallas.....	48	13. 3	12. 0	6	3	-----
Dayton.....	56	17. 3	13. 9	6	4	101
Denver.....	94			8	4	-----
Des Moines.....	38	13. 7	10. 7	2	3	-----
Detroit.....	291			46	52	86
Duluth.....	23	11. 1	16. 7	5	3	107
Erie.....	18			2	2	41
Fall River.....	27	11. 6	11. 2	6	6	84
Flint.....	25			5	3	86
Fort Worth.....	23	8. 1	6. 9	4	0	-----
Grand Rapids.....	37	13. 0	16. 8	9	7	140

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

<sup>2</sup> Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1923. Cities left blank are not in the registration area for births.

<sup>3</sup> Data for 64 cities.

<sup>4</sup> Deaths for week ended Friday, April 18, 1924.

*Deaths from all causes in certain large cities of the United States during the week ended April 19, 1924, infant mortality, annual death rate, and comparison with corresponding week of 1923—Continued.*

City.	Week ended Apr. 19, 1924.		Annual death rate per 1,000, corresponding week, 1923.	Deaths under 1 year.		Infant mortality rate, week ended Apr. 19, 1924.
	Total deaths.	Death rate.		Week ended Apr. 19, 1924.	Corresponding week, 1923.	
Indianapolis.....	94	14.0	16.7	9	10	68
Jacksonville, Fla.....	46	23.4	12.5	3	0	-----
Jersey City.....	85	14.2	12.0	9	11	65
Kansas City, Kans.....	41	18.2	16.7	5	6	100
Kansas City, Mo.....	110	15.9	16.5	14	9	-----
Los Angeles.....	240	-----	-----	31	23	97
Louisville.....	92	18.6	20.4	7	12	67
Lowell.....	26	11.7	18.1	4	9	71
Lynn.....	25	12.6	14.2	2	2	51
Memphis.....	73	22.1	19.3	10	7	-----
Milwaukee.....	103	10.9	12.3	19	19	87
Minneapolis.....	99	12.4	12.6	20	13	107
Nashville <sup>1</sup> .....	49	20.7	24.7	4	3	-----
New Bedford.....	20	7.9	12.4	5	9	78
New Haven.....	34	10.1	13.3	1	7	13
New Orleans.....	141	18.0	15.6	18	12	-----
New York.....	1,518	13.2	12.1	211	175	85
Bronx Borough.....	189	11.3	9.7	19	23	67
Brooklyn Borough.....	497	11.8	11.4	73	65	79
Manhattan Borough.....	677	15.6	14.2	101	73	98
Queens Borough.....	163	9.7	9.0	11	9	60
Richmond Borough.....	52	20.7	16.4	7	5	128
Newark, N. J.....	118	13.8	14.0	16	17	75
Norfolk.....	30	9.5	10.5	2	4	36
Oakland.....	57	12.0	8.3	6	2	75
Oklahoma City.....	19	9.5	-----	4	-----	-----
Omaha.....	76	19.0	14.0	14	4	150
Paterson.....	40	14.8	13.4	1	6	16
Philadelphia.....	661	15.0	15.3	68	65	86
Pittsburgh.....	269	17.4	16.3	31	25	105
Portland, Oreg.....	63	11.8	11.4	6	3	62
Providence.....	73	15.6	15.1	12	4	98
Richmond.....	55	15.6	19.3	5	13	59
Rochester.....	75	12.0	15.9	6	11	47
St. Louis.....	253	16.2	15.2	20	27	-----
St. Paul.....	55	11.8	12.5	7	5	69
Salt Lake City <sup>1</sup> .....	32	13.0	14.5	9	3	159
San Antonio.....	68	18.5	14.7	11	8	-----
San Francisco.....	129	12.3	13.4	11	7	66
Schenectady.....	27	14.0	7.4	3	0	85
Seattle.....	76	-----	-----	5	6	48
Somerville.....	20	10.4	11.1	1	2	27
Spokane.....	17	-----	-----	5	3	106
Springfield, Mass.....	37	12.0	10.8	4	4	68
Syracuse.....	51	14.1	13.3	8	12	99
Tacoma.....	20	10.1	10.8	7	4	161
Toledo.....	61	11.5	13.4	7	6	66
Trenton.....	33	13.3	16.4	7	2	115
Utica.....	26	12.9	15.6	2	3	43
Washington, D. C.....	128	13.7	17.9	15	26	86
Waterbury.....	22	-----	-----	4	6	89
Wilmington, Del.....	39	17.0	14.6	7	8	152
Worcester.....	59	15.7	14.1	4	11	48
Yonkers.....	21	10.0	14.5	4	3	87
Youngstown.....	34	11.4	14.9	10	8	145

<sup>1</sup>Deaths for week ended Friday, April 18, 1924.



## DEATHS DURING WEEK ENDED APRIL 26, 1924.

Summary of information received by telegraph from industrial insurance companies for week ended April 26, 1924, and corresponding week of 1923. (From the Weekly Health Index, April 29, 1924, issued by the Bureau of the Census, Department of Commerce.)

Policies in force.....	Week ended April 26, 1924.	Corresponding week, 1923.
Number of death claims.....	57, 399, 419	53, 256, 814
Death claims per 1,000 policies in force, annual rate.....	12, 192	11, 268
	11.1	11.0

Deaths from all causes in certain large cities of the United States during the week ended April 26, 1924, infant mortality, annual death rate, and comparison with corresponding week of 1923. (From the Weekly Health Index, April 29, 1924, issued by the Bureau of the Census, Department of Commerce.)

City.	Week ended Apr. 26, 1924.		Annual death rate per 1,000, corre- sponding week, 1923.	Deaths under 1 year.		Infant mortality rate, week ended Apr. 26, 1924. <sup>2</sup>
	Total deaths.	Death rate. <sup>1</sup>		Week ended Apr. 26, 1924	Corre- sponding week, 1923.	
Total (63 cities).....	7, 188	14.3	<sup>3</sup> 14.4	896	<sup>3</sup> 893	-----
Akron.....	32			5	4	53
Albany <sup>4</sup> .....	30	13.2	17.8	5	7	110
Atlanta.....	87	19.9	16.4	12	17	
Baltimore <sup>4</sup> .....	269	17.9	16.5	32	33	93
Birmingham.....	71	18.4	21.0	9	10	
Boston.....	225	15.1	17.9	28	30	78
Bridgeport.....	36			1	12	16
Cambridge.....	49	22.8	18.7	4	4	69
Camden.....	38	15.7	18.5	9	8	142
Chicago <sup>4</sup> .....	715	12.7	13.1	94	106	87
Cincinnati.....	122	15.6	16.6	13	8	82
Cleveland.....	215	12.3	10.6	29	29	76
Columbus.....	63	12.3	14.8	8	7	76
Dallas.....	58	16.1	10.9	12	7	
Dayton.....	36	11.1	13.2	3	3	50
Denver.....	88			10	13	
Des Moines.....	28	10.1	11.8	1	3	
Detroit.....	291			54	48	101
Duluth.....	21	10.1	13.7	6	4	128
Erie.....	30			8	2	165
Fall River <sup>4</sup> .....	23	9.9	14.7	7	7	99
Flint.....	21			3	6	52
Fort Worth.....	33	11.6	9.8	2	1	
Grand Rapids.....	31	10.9	12.5	3	3	47
Houston.....	55			7	2	
Indianapolis.....	83	12.4	11.4	7	9	53
Jacksonville, Fla.....	32	16.3	16.7	3	3	
Jersey City.....	85	14.2	14.3	14	15	101
Kansas City, Kans.....	33	14.6	18.0	6	1	120
Kansas City, Mo.....	108	15.7	18.1	15	16	
Los Angeles.....	227			20	23	62
Louisville.....	71	14.3	16.0	6	14	58
Lowell.....	41	18.5	20.8	4	6	71
Lynn.....	15	7.5	13.7	4	5	101
Memphis.....	67	20.3	23.6	8	6	
Milwaukee.....	97	10.3	14.1	16	24	73
Minneapolis.....	94	11.7	14.0	11	13	59
Nashville <sup>4</sup> .....	53	22.4	24.2	3	9	
New Bedford.....	40	15.7	15.2	7	4	109
New Haven.....	37	11.0	10.9	6	6	78
New Orleans.....	122	15.5	16.8	14	14	
New York.....	1, 600	13.9	13.7	198	207	80
Bronx Borough.....	180	10.8	10.8	22	20	78
Brooklyn Borough.....	531	12.6	11.5	74	74	80
Manhattan Borough.....	701	16.2	17.3	82	93	80
Queens Borough.....	147	13.8	10.9	18	17	98
Richmond Borough.....	41	16.4	18.4	2	3	36

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

<sup>2</sup> Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1923. Cities left blank are not in the registration area for births.

<sup>3</sup> Data for 64 cities.

<sup>4</sup> Deaths for week ended Friday, Apr. 25, 1924.

*Deaths from all causes in certain large cities of the United States during the week ended April 26, 1924, infant mortality, annual death rate, and comparison with corresponding week of 1923—Continued.*

City.	Week ended Apr. 26, 1924.		Annual death rate per 1,000, corre- sponding week, 1923.	Deaths under 1 year.		Infant mor- tality rate, week ended Apr. 26, 1924.
	Total deaths.	Death rate.		Week ended Apr. 26, 1924.	Corre- sponding week, 1923.	
Newark, N. J.....	120	14.0	15.2	25	20	117
Norfolk.....	44	14.0		4		73
Oakland.....	54	11.4	11.1	14	6	175
Oklahoma City.....	26	13.0		2		
Omaha.....	54	13.5	16.3	5	9	54
Paterson.....	42	15.6	15.7	6	5	98
Philadelphia.....	575	15.4	15.9	66	65	84
Pittsburgh.....	213	17.7	16.7	14	37	47
Portland, Oreg.....	59	11.1	11.2	7	4	72
Providence.....	73	15.6	17.6	13	10	106
Richmond.....	55	15.6	14.1	10	9	118
St. Louis.....	265	17.0	14.5	23	16	
St. Paul.....	68	14.5	10.1	12	2	103
Salt Lake City <sup>1</sup> .....	42	17.0	11.2	10	2	166
San Antonio.....	60	16.3	16.9	10	10	
San Francisco.....	150	15.1	14.7	9	11	54
Schenectady.....	20	10.4	7.4	4	2	113
Seattle.....	68			3	8	29
Somerville.....	26	13.5	10.6	1	0	27
Spokane.....	39			6	1	127
Springfield, Mass.....	35	12.3	13.4	3	5	51
Syracuse.....	43	11.9	15.8	7	6	87
Tacoma.....	20	10.1	8.7	4	1	92
Toledo.....	80	15.1	9.9	14	3	133
Trenton.....	44	17.7	16.0	5	4	82
Utica.....	22	10.9	16.1	1	0	22
Washington, D. C.....	146	15.6	14.7	7	11	40
Waterbury.....	22			4	9	89
Wilmington, Del.....	29	12.6	12.8	4	4	87
Worcester.....	61	16.3	12.8	7	9	84
Yonkers.....	22	10.5	11.6	1	1	22
Youngstown.....	39	13.1	8.3	9	2	130

<sup>1</sup>Deaths for week ended Friday, April 25, 1924.





## KANSAS—continued.

	Cases.
Measles.....	607
Mumps.....	319
Pellagra.....	1
Pneumonia.....	258
Scarlet fever.....	52
Smallpox.....	60
Tetanus.....	4
Trachoma.....	1
Tuberculosis.....	70
Typhoid fever.....	5
Whooping cough.....	85

## LOUISIANA.

Diphtheria.....	20
Hookworm disease.....	17
Influenza.....	7
Malaria.....	10
Measles.....	124
Pellagra.....	9
Pneumonia.....	51
Scarlet fever.....	14
Smallpox.....	11
Tuberculosis.....	29
Typhoid fever.....	13

## MAINE.

Chicken pox.....	26
Diphtheria.....	4
German measles.....	7
Influenza.....	8
Measles.....	130
Mumps.....	17
Pneumonia.....	19
Scarlet fever.....	39
Tetanus.....	1
Tuberculosis.....	9
Whooping Cough.....	28

MARYLAND.<sup>1</sup>

Cerebrospinal meningitis.....	1
Chicken pox.....	100
Diphtheria.....	26
German measles.....	67
Influenza.....	52
Lethargic encephalitis.....	1
Malaria.....	2
Measles.....	314
Mumps.....	56
Paratyphoid fever.....	1
Pneumonia (all forms).....	83
Scarlet fever.....	125
Tuberculosis.....	52
Typhoid fever.....	8
Whooping cough.....	47

## MASSACHUSETTS.

Cerebrospinal meningitis.....	5
Chicken pox.....	167
Conjunctivitis (suppurative).....	19
Diphtheria.....	126
German measles.....	77
Influenza.....	6
Lethargic encephalitis.....	2
Malaria.....	2
Measles.....	917
Mumps.....	293

## MASSACHUSETTS—continued.

	Cases.
Ophthalmia neonatorum.....	32
Pneumonia (lobar).....	140
Scarlet fever.....	323
Septic sore throat.....	4
Trachoma.....	3
Trichinosis.....	1
Tuberculosis (all forms).....	157
Typhoid fever.....	3
Whooping cough.....	77

## MICHIGAN.

Diphtheria.....	147
Measles.....	760
Pneumonia.....	144
Scarlet fever.....	321
Smallpox.....	216
Tuberculosis.....	306
Typhoid fever.....	10
Whooping cough.....	103

## MINNESOTA.

Chicken pox.....	136
Diphtheria.....	45
Lethargic encephalitis.....	2
Measles.....	144
Pneumonia.....	2
Scarlet fever.....	214
Smallpox.....	64
Tuberculosis.....	103
Typhoid fever.....	5
Whooping cough.....	22

## MISSISSIPPI.

Cerebrospinal-meningitis.....	1
Diphtheria.....	10
Scarlet fever.....	3
Smallpox.....	33
Typhoid fever.....	12

## MISSOURI.

Chicken pox.....	48
Diphtheria.....	49
Influenza.....	6
Measles.....	293
Mumps.....	144
Ophthalmia neonatorum.....	1
Pneumonia.....	13
Scarlet fever.....	104
Smallpox.....	17
Trachoma.....	3
Tuberculosis.....	54
Typhoid fever.....	4
Whooping cough.....	100

## MONTANA.

Diphtheria.....	15
Rocky Mountain spotted fever:	
Bearmouth.....	1
Billings.....	1
Billings, R. F. D. No. 1.....	1
Bridger.....	1
Darby.....	1
Forsyth.....	1
Scarlet fever.....	42
Smallpox.....	34
Typhoid fever.....	5

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





*Measles.*—Reports from both State and city health officers indicated a decrease in the prevalence of measles from the preceding week. Thirty States reported 13,833 cases for the week ended April 19, 1924. These States reported 19,669 cases for the corresponding week of 1923. The figures for 102 cities for the week were 5,175 cases in 1924, and 10,699 cases in 1923.

*Scarlet fever.*—Thirty-six States reported 3,398 cases of scarlet fever for the week ended April 19, 1924. For the corresponding week of 1923 these States reported 3,423 cases. Reports from 102 cities for the week were as follows: 1924, 1,634 cases; 1923, 1,668 cases; estimated expectancy, 1,004 cases.

*Smallpox.*—Thirty-six States reported smallpox for the week, as follows: This year, 1,425 cases; last year, 463 cases. The cities for which comparative figures are given reported 471 cases for the week ended April 19, 1924, and only 100 cases for the corresponding week of 1923. The estimated expectancy for these cities was 189 cases. Considering the large number of cases of smallpox, very few deaths from this disease have been reported since January 1, 1924, in the United States.

*Influenza and pneumonia.*—Deaths for the weeks ended April 19, 1924, and April 21, 1923, were reported by 102 cities, as follows: Influenza, 1924, 80 deaths; 1923, 124 deaths. Pneumonia, 1924, 1,096 deaths; 1923, 900 deaths.

*City reports for week ended April 19, 1924.*

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid ever is the result of an attempt to ascertain from previous occurrence how many cases of the disease under consideration 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 week 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 nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1915 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations 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.	Chicken pox, cases reported.	Diphtheria.		Influenza.		Measles, cases reported.	Mumps, cases reported.	Pneumonia, deaths reported.	Scarlet fever.	
		Cases, estimated expectancy.	Cases reported.	Cases reported.	Deaths reported.				Cases, estimated expectancy.	Cases reported.
NEW ENGLAND.										
Maine:										
Lewiston.....	1	1	1	0	0	8	0	1	3	0
Portland.....	2	1	6	0	0	1	39	2	3	0
New Hampshire:										
Concord.....	0	0	0	0	0	50	0	0	1	0
Manchester.....	0	2	0	0	0	11	0	3	2	8
Nashua.....	0	0	0	0	0	0	0	1	2	1
Vermont:										
Barre.....	0	0	0	0	0	0	1	0	1	1
Burlington.....	1	1	0	0	0	7	0	1	1	2



## City reports for week ended April 19, 1924—Continued.

Division, State, and city.	Chick- en pox, cases re- ported.	Diphtheria.		Influenza.		Meas- les, cases re- ported.	Mumps, cases re- ported.	Pneu- monia, deaths re- ported.	Scarlet fever.	
		Cases, esti- mated expect- ancy.	Cases re- ported.	Cases re- ported.	Deaths re- ported.				Cases, esti- mated expect- ancy.	Cases re- ported.
NEW ENGLAND— continued.										
Massachusetts:										
Boston.....	40	58	67	5	0	156	24	30	54	85
Fall River.....	1	4	4	0	0	32	6	1	4	13
Springfield.....	3	4	2	0	0	59	2	1	5	25
Worcester.....	6	5	11	0	0	10	32	4	7	14
Rhode Island:										
Pawtucket.....	10	2	0	0	0	1	10	2	1	8
Providence.....	0	11	5	-----	1	1	0	14	8	56
Connecticut:										
Bridgeport.....	3	6	0	3	2	1	3	3	5	11
Hartford.....	-----	6	3	0	0	34	-----	0	4	30
New Haven.....	3	4	1	0	0	8	40	4	6	10
MIDDLE ATLANTIC.										
New York:										
Buffalo.....	0	10	15	0	0	28	0	22	20	23
New York.....	1,228	302	234	59	15	1,948	278	251	199	281
Rochester.....	3	6	0	0	0	22	12	12	11	20
Syracuse.....	20	7	11	0	0	35	14	8	12	34
New Jersey:										
Camden.....	-----	3	6	0	0	2	-----	8	2	1
Newark.....	36	18	8	6	0	125	97	11	23	27
Trenton.....	4	4	2	-----	1	29	0	3	4	0
Pennsylvania:										
Philadelphia.....	72	64	73	1	4	105	-----	60	67	5
Pittsburgh.....	43	18	25	2	8	38	91	60	19	31
Reading.....	3	2	0	-----	3	15	49	3	3	4
Scranton.....	3	3	0	0	0	2	0	9	2	1
E. NORTH CENTRAL.										
Ohio:										
Cincinnati.....	11	9	4	-----	1	118	15	14	13	11
Cleveland.....	74	20	20	2	3	93	361	29	22	17
Columbus.....	9	4	3	0	0	9	0	6	6	13
Toledo.....	43	4	0	-----	2	56	0	4	14	15
Indiana:										
Fort Wayne.....	-----	3	8	0	0	8	-----	3	2	4
Indianapolis.....	-----	5	7	0	0	43	-----	9	17	3
South Bend.....	0	1	3	0	0	1	0	4	3	11
Terre Haute.....	4	1	0	0	0	8	0	3	1	1
Illinois:										
Chicago.....	115	103	84	17	5	155	148	84	106	120
Cicero.....	4	1	2	0	0	1	44	2	3	0
Springfield.....	16	1	1	3	0	3	1	7	2	7
Michigan:										
Detroit.....	53	62	52	3	5	186	59	56	70	71
Flint.....	13	3	7	0	0	21	37	8	7	9
Grand Rapids.....	13	4	8	0	0	3	34	4	6	16
Saginaw.....	2	1	1	0	0	9	2	3	2	19
Wisconsin:										
Madison.....	20	0	1	0	0	1	1	0	2	5
Milwaukee.....	38	13	8	5	0	25	8	0	30	32
Racine.....	12	1	2	0	0	0	0	3	4	13
Superior.....	1	1	1	0	0	0	0	0	1	1
W. NORTH CENTRAL.										
Minnesota:										
Duluth.....	1	2	0	0	(	7	0	5	3	12
Minneapolis.....	72	15	7	-----	1	51	6	14	25	48
St. Paul.....	-----	14	4	0	0	26	-----	7	17	42
Iowa:										
Davenport.....	-----	1	0	0	-----	0	-----	-----	2	7
Des Moines.....	1	3	1	0	0	4	0	-----	12	4
Sioux City.....	0	2	0	0	-----	1	0	-----	2	0
Waterloo.....	6	0	0	0	-----	4	9	-----	2	3
Missouri:										
Kansas City.....	10	7	7	3	3	77	22	15	9	14
St. Joseph.....	4	1	0	0	0	4	4	3	2	3
St. Louis.....	26	48	35	2	0	60	57	-----	58	84

City reports for week ended April 19, 1924—Continued.

Division, State, and city.	Chick- en pox, cases re- ported.	Diphtheria.		Influenza.		Meas- les, cases re- ported.	Mumps, cases re- ported.	Pneu- monia, deaths re- ported.	Scarlet fever.	
		Cases, es- timated ex- pectancy.	Cases re- ported.	Cases re- ported.	Deaths re- ported.				Cases, es- timated ex- pectancy.	Cases re- ported.
<b>W. NORTH CENTRAL—contd.</b>										
North Dakota:										
Fargo.....	0	0	0	0	0	0	0	3	3	0
Grank Forks.....	1	0	0	0	0	11	0	0	0	1
South Dakota:										
Aberdeen.....	1		0	0	0	27	0	0		1
Sioux Falls.....	7	1	0	0	0	0	0	1	1	8
Nebraska:										
Lincoln.....		2	4	0	0	7			2	0
Omaha.....	7	4	2	0	0	57	0	12	12	1
Kansas:										
Topeka.....	8	1	2	0	0	46	4	1	3	3
Wichita.....	1	1	3	0	0	15	70	3	3	3
<b>SOUTH ATLANTIC.</b>										
Delaware:										
Wilmington.....		2	1	0	0	1		4	3	9
Maryland:										
Baltimore.....	94	20	33	15	1	222	29	37	27	78
Cumberland.....		1	0	0	0	0		3	1	2
Frederick.....		0	0	0	0	6		0	0	16
District of Col.:										
Washington.....	49	11	4	1	1	17		13	18	40
Virginia:										
Lynchburg.....	0	0	3	0	0	1	0	1	0	0
Norfolk.....		0	1	0	0	47		4	2	1
Richmond.....	8	2	2	3	0	84	1	3	2	0
Roanoke.....	4	1	0	0	0	1	6	2	1	2
West Virginia:										
Charleston.....		0	1	0	0	1		0	1	0
Huntington.....	0	0	0	0	0	0	0	1	1	0
Wheeling.....	8	1	1	0	0	3	2	3	2	4
North Carolina:										
Raleigh.....	18	0	0	0	0	10	0	2	0	0
Wilmington.....	9	1	1	0	0	21	6	1	1	1
Winston-Salem.....	4	1	0	0	0	23	0	4	1	29
South Carolina:										
Charleston.....	1	1	0	0	0	0	0	3	1	0
Columbia.....	9	0	0	0	0	11	0	2	0	0
Greenville.....	0	0	0	0	0	13	10	3	1	0
Georgia:										
Atlanta.....	3	2	2	9	1	5	5	27	3	2
Brunswick.....	0	1	0	0	0	3	0	0	0	0
Savannah.....		1	1	1	0	10		2	1	0
Florida:										
St. Petersburg.....	5		1	0	0	2	0	0		5
Tampa.....	0	2	1	0	0	6	0	4	0	0
<b>E. SOUTH CENTRAL</b>										
Kentucky:										
Covington.....	2	1	5		1	9	4	0	1	4
Lexington.....	0	0	0	0	0	25	0	0	0	1
Louisville.....	4	5	4	7	0	9	5	16	5	4
Tennessee:										
Memphis.....	26	3	5		3	45	26	15	3	6
Nashville.....	2	0	0		7	17	0	6	2	0
Alabama:										
Birmingham.....		1	0	3	0	48		13	1	2
Mobile.....	1	0	0	0	0	19	0	5	1	0
Montgomery.....		0	0	0	0	12		2	1	0
<b>W. SOUTH CENTRAL</b>										
Arkansas:										
Fort Smith.....		1							0	
Little Rock.....	0	1	1	0		20	0		1	0
Louisiana:										
New Orleans.....	4	7	18	7	3	74	0	18	2	14
Shreveport.....	0		1	0	0	0	2	3		

## City reports for week ended April 19, 1924—Continued.

Division, State, and city.	Chick- en pox, cases re- ported.	Diphtheria.		Influenza.		Mea- sles, cases re- ported.	Mumps, cases re- ported.	Pneu- monia, deaths re- ported.	Scarlet fever.	
		Cases, esti- mated expect- ancy.	Cases re- ported.	Cases re- ported.	Deaths re- ported.				Cases, esti- mated expect- ancy.	Cases re- ported.
<b>W. SOUTH CEN- TRAL—continued.</b>										
Oklahoma:										
Oklahoma.....	2	2	0	0	0	4	17	1	3	0
Tulsa.....	1	1	1	0		15	0		2	2
Texas:										
Dallas.....	9	3	5		1	17	12	3	1	6
Galveston.....	0	0	0	0	0	0	0	1	0	1
Houston.....		2	3	0	0	1		4	1	0
San Antonio.....	1	2	2	0	0	17	3	14	1	1
<b>MOUNTAIN.</b>										
Montana:										
Billings.....	3	1	0	0	0	2	0	1	1	3
Great Falls.....	0	1	4		1	7	0	2	1	0
Helena.....	0		0	0	0	0	0	0		0
Missoula.....	1	1	0	0	0	17	0	0	1	0
Idaho:										
Boise.....	2	0	0	0	0	23	2	0	2	0
Colorado:										
Denver.....	27	10	43		3	73	0	13	9	15
Pueblo.....	2	1	1	0	0	10	1	2	2	1
New Mexico:										
Albuquerque.....	0	2	0	0	0	30	0	4	2	0
Utah:										
Salt Lake City.....	17	4	4	0	0	47	12	4	4	0
Nevada:										
Reno.....	0	0	0	0	0	0	0	3	0	0
<b>PACIFIC.</b>										
Washington:										
Seattle.....		4							8	
Spokane.....		2							3	
Tacoma.....		2							3	
Oregon:										
Portland.....	6	3	8	0	0	16	6	5	6	3
California:										
Los Angeles.....		20	58	6	3	271		16	11	56
Sacramento.....	2	1	2	0	0	9	0	2	1	2
San Francisco.....	65	26	41	0	0	75	15	9	14	35

City reports for week ended April 19, 1924—Continued.

Division, State, and city.	Popula- tion, July 1, 1923, estimated.	Smallpox.			Tuberculosis, deaths reported.	Typhoid fever.			Whooping cough, cases reported.	Deaths, all causes.
		Cases, estimated expectancy.	Cases reported.	Deaths reported.		Cases, estimated expectancy.	Cases reported.	Deaths reported.		
<b>NEW ENGLAND.</b>										
<b>Maine:</b>										
Lewiston.....	33,790	0	0	0	0	0	0	0	0	10
Portland.....	73,129	0	0	0	1	1	1	0	0	17
<b>New Hampshire:</b>										
Concord.....	22,408	0	0	0	0	0	0	0	0	7
Manchester.....	81,383	0	0	0	0	0	0	0	0	24
Nashua.....	29,234	0	0	0	0	0	0	0	0	3
<b>Vermont:</b>										
Barre.....	1 10,608	0	0	0	0	0	0	0	1	2
Burlington.....	23,613	0	0	0	0	0	0	0	0	4
<b>Massachusetts:</b>										
Boston.....	770,400	0	0	0	22	2	2	0	9	248
Fall River.....	120,912	0	0	0	1	1	1	0	3	27
Springfield.....	144,227	0	0	0	2	0	0	0	1	33
Worcester.....	191,927	0	0	0	5	0	0	0	6	59
<b>Rhode Island:</b>										
Pawtucket.....	68,799	0	0	0	0	0	0	0	0	18
Providence.....	242,378	0	0	0	3	1	0	0	1	73
<b>Connecticut:</b>										
Bridgeport.....	1 143,555	0	0	0	1	0	0	0	2	37
Hartford.....	1 138,036	0	0	0	0	0	0	0	0	21
New Haven.....	172,967	0	1	0	3	0	0	0	1	34
<b>MIDDLE ATLANTIC.</b>										
<b>New York:</b>										
Buffalo.....	563,718	0	0	0	15	1	0	0	39	153
New York.....	5,927,625	0	0	0	2 160	10	11	1	165	1,518
Rochester.....	317,667	0	0	0	6	1	0	0	7	75
Syracuse.....	184,511	0	0	0	4	0	1	0	0	51
<b>New Jersey:</b>										
Camden.....	124,157	0	0	0	0	0	1	0	0	44
Newark.....	438,699	0	0	0	15	1	1	0	30	108
Trenton.....	127,390	0	0	0	2	1	0	0	4	33
<b>Pennsylvania:</b>										
Philadelphia.....	1,922,788	0	0	0	56	6	3	1	32	561
Pittsburgh.....	613,442	0	0	0	12	2	0	0	35	209
Reading.....	110,917	0	0	0	2	0	0	0	2	53
Scranton.....	140,636	0	0	0	2	0	0	0	0	---
<b>EAST NORTH CENTRAL.</b>										
<b>Ohio:</b>										
Cincinnati.....	406,312	2	8	0	15	1	0	1	23	141
Cleveland.....	888,519	3	0	0	23	3	0	0	44	213
Columbus.....	261,082	1	0	0	2	0	0	0	7	74
Toledo.....	268,338	2	21	0	4	1	0	0	34	61
<b>Indiana:</b>										
Fort Wayne.....	93,573	3	4	0	0	0	0	0	---	24
Indianapolis.....	342,718	6	47	0	6	0	9	0	---	94
Scuth Bend.....	76,769	0	0	0	1	0	0	0	0	17
Terre Haute.....	68,939	0	9	0	0	0	0	0	3	25
<b>Illinois:</b>										
Chicago.....	2,866,121	2	12	0	45	3	2	0	43	705
Cicero.....	55,968	1	0	0	0	0	0	0	11	9
Springfield.....	61,833	1	0	0	0	0	1	0	2	25
<b>Michigan:</b>										
Detroit.....	995,668	7	59	2	20	3	4	0	19	291
Flint.....	117,968	1	10	0	0	1	0	0	9	30
Grand Rapids.....	145,947	1	2	0	1	1	0	0	0	41
Saginaw.....	69,754	0	3	0	0	1	3	0	1	15
<b>Wisconsin:</b>										
Madison.....	42,519	2	0	0	0	0	0	0	4	6
Milwaukee.....	484,595	3	1	0	0	0	1	0	31	103
Racine.....	64,393	1	10	0	1	0	0	0	0	18
Superior.....	1 39,671	1	2	0	0	0	0	0	0	9

<sup>1</sup> Population Jan. 1, 1920.

<sup>2</sup> Fulmonary only.

## City reports for week ended April 19, 1924—Continued.

Division, State, and city.	Popula- tion, July 1, 1923, estimated.	Smallpox.			Tuberculosis, deaths reported.	Typhoid fever.			Whooping cough, cases reported.	Deaths, all causes.
		Cases, estimated expectancy.	Cases reported.	Deaths reported.		Cases, estimated expectancy.	Cases reported.	Deaths reported.		
<b>WEST NORTH CENTRAL.</b>										
Minnesota:										
Duluth.....	106,289	2	5	0	1	0	2	0	1	23
Minneapolis.....	409,125	17	6	0	4	1	1	1	6	99
St. Paul.....	241,891	8	8	0	7	1	0	0		55
Iowa:										
Davenport.....	61,262	8	9			0	0			
Des Moines.....	140,923	3	7			0	0		0	
Sioux City.....	79,662	3	1			0	0			
Waterloo.....	39,667	0	0			1	0		4	
Missouri:										
Kansas City.....	351,819	6	2	0	8	1	1	1	10	110
St. Joseph.....	78,232	8	0	0	1	0	0	0	3	27
St. Louis.....	803,853	8	2	0	10	2	2	1	31	253
North Dakota:										
Fargo.....	24,841	1	0	0	1	0	0	0	0	9
Grand Forks.....	14,517	1	0	0	0	0	0	0	0	
South Dakota:										
Aberdeen.....	15,829		0	0	0	0	0	0	0	
Sioux Falls.....	29,266	3	0	0	0	0	0	0	0	11
Nebraska:										
Lincoln.....	58,761	4	0	0	0	0	0	0		10
Omaha.....	204,392	9	4	0	5	0	0	0	0	76
Kansas:										
Topeka.....	52,555	2	0	0	0	0	0	0	3	7
Wichita.....	79,261	6	13	0	0	0	0	0	5	25
<b>SOUTH ATLANTIC.</b>										
Delaware:										
Wilmington.....	117,728	0	0	0	5	0	0	0		39
Maryland:										
Baltimore.....	773,580	0	1	0	19	3	1	2	29	210
Cumberland.....	32,361	0	0	0	0	0	0	0		15
Frederick.....	11,391	0	0	0	0	0	1	0		5
District of Columbia:										
Washington.....	1 437,571	1	1	0	10	1	0	0	10	128
Virginia:										
Lynchburg.....	30,277	0	0	0	1	0	0	0	2	7
Norfolk.....	159,089	1	0	0	6	0	0	0		
Richmond.....	181,044	0	2	0	3	0	0	0	3	51
Roanoke.....	55,502	1	0	0	1	0	0	0	3	21
West Virginia:										
Charleston.....	45,597	0	4	0	1	0	0	0	0	14
Huntington.....	57,918	0	0	0	2	0	0	0	0	21
Wheeling.....	1 56,208	0	0	0	1	0	0	0	0	19
North Carolina:										
Raleigh.....	29,171	0	9	0	2	0	0	0	3	14
Wilmington.....	35,719	0	0	0	1	0	0	0	0	21
Winston-Salem.....	56,230	2	6	0	3	0	1	0	2	22
South Carolina:										
Charleston.....	71,245	1	1	0	1	1	0	0	0	23
Columbia.....	39,688	1	2	0	2	0	0	0	0	10
Greenville.....	25,739	0	12	0	1	0	0	0	7	17
Georgia:										
Atlanta.....	222,963	5	53	1	5	0	0	0	0	83
Brunswick.....	15,937	0	0	0	1	1	0	0	3	5
Savannah.....	89,445	1	1	0	5	0	1	0		23
Florida:										
St. Petersburg.....	24,403		1	0	0		0	0	0	11
Tampa.....	56,050	0	0	0	2	1	0	0	1	19
<b>EAST SOUTH CENTRAL.</b>										
Kentucky:										
Covington.....	57,877	0	0	0	0	0	1	0	0	10
Lexington.....	43,673	0	0	0	0	0	0	0	0	16
Louisville.....	257,671	1	2	0	2	0	1	1	0	92

<sup>1</sup>Population Jan. 1, 1920.

City reports for week ended April 19, 1924—Continued.

Division, State, and city.	Popula- tion, July 1, 1923, estimated.	Smallpox.			Tuberculosis, deaths reported.	Typhoid fever.			Whooping cough, cases reported.	Deaths, all causes.
		Cases, estimated expectancy.	Cases reported.	Deaths reported.		Cases, estimated expectancy.	Cases reported.	Deaths reported.		
<b>EAST SOUTH CENTRAL—continued.</b>										
<b>Tennessee:</b>										
Memphis.....	170,067	3	0	0	4	0	0	0	4	73
Nashville.....	121,128	0	0	0	3	1	0	0	6	49
<b>Alabama:</b>										
Birmingham.....	195,001	1	23	0	8	1	0	1	0	65
Mobile.....	63,858	2	0	0	0	0	1	1	0	26
Montgomery.....	45,383	1	1	0	2	0	1	0	0	16
<b>WEST SOUTH CENTRAL.</b>										
<b>Arkansas:</b>										
Fort Smith.....	30,635	0	0	0	0	0	0	0	0	0
Little Rock.....	70,916	0	1	0	0	0	1	0	0	0
<b>Louisiana:</b>										
New Orleans.....	404,575	4	0	0	11	3	2	1	0	141
Shreveport.....	54,590	0	2	0	2	0	0	0	0	29
<b>Oklahoma:</b>										
Oklahoma.....	101,150	6	1	0	0	0	0	0	0	19
Tulsa.....	102,018	3	3	0	0	0	0	0	0	0
<b>Texas:</b>										
Dallas.....	177,274	3	2	0	3	0	0	0	1	48
Galveston.....	46,877	0	0	0	4	1	1	0	0	13
Houston.....	154,970	0	0	0	4	0	0	0	0	38
San Antonio.....	184,727	0	0	0	11	1	0	0	0	68
<b>MOUNTAIN.</b>										
<b>Montana:</b>										
Billings.....	16,927	0	6	0	0	0	0	0	0	3
Great Falls.....	27,787	2	0	0	0	0	0	0	0	7
Helena.....	<sup>1</sup> 12,037	0	0	0	0	0	0	0	0	2
Missoula.....	<sup>1</sup> 12,668	2	2	0	0	0	0	0	0	5
<b>Idaho:</b>										
Boise.....	22,806	1	1	0	0	0	0	0	0	3
<b>Colorado:</b>										
Denver.....	272,031	10	1	0	14	0	0	0	5	94
Pueblo.....	43,519	0	0	0	0	0	0	0	0	9
<b>New Mexico:</b>										
Albuquerque.....	16,648	0	0	0	8	0	1	0	0	25
<b>Utah:</b>										
Salt Lake City.....	126,241	9	0	0	2	1	4	0	3	32
<b>Nevada:</b>										
Reno.....	12,429	0	0	0	0	0	0	0	1	7
<b>PACIFIC.</b>										
<b>Washington:</b>										
Seattle.....	<sup>1</sup> 315,685	9	0	0	0	0	0	0	0	0
Spokane.....	104,573	12	0	0	0	0	0	0	0	0
Tacoma.....	101,731	2	0	0	0	1	0	0	0	0
<b>Oregon:</b>										
Portland.....	273,621	6	16	0	3	1	3	1	0	63
<b>California:</b>										
Los Angeles.....	66,853	3	110	0	31	1	3	0	0	240
Sacramento.....	69,950	0	0	0	3	1	1	0	0	20
San Francisco.....	539,038	2	1	0	10	2	0	0	0	131

<sup>1</sup> Population Jan. 1, 1920.

## City reports for week ended April 19, 1924—Continued.

Division, State, and city.	Cerebro-spinal meningitis.		Lethargic encephalitis.		Pellagra.		Poliomyelitis (infantile paralysis).		
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases, est. expectancy.	Cases.	Deaths.
<b>NEW ENGLAND.</b>									
New Hampshire:									
Concord.....	0	0	0	0	0	1	0	0	0
Massachusetts:									
Boston.....	0	0	0	0	0	0	0	1	0
Fall River.....	0	0	0	0	0	0	0	1	0
<b>MIDDLE ATLANTIC.</b>									
New York:									
Buffalo.....	0	1	0	0	0	0	0	0	0
New York.....	4	3	10	4	0	0	1	2	0
New Jersey:									
Newark.....	1	0	3	0	0	0	0	1	0
Trenton.....	0	0	1	0	0	0	0	0	0
Pennsylvania:									
Philadelphia.....	1	0	1	1	0	0	0	1	1
<b>EAST NORTH CENTRAL.</b>									
Ohio:									
Cincinnati.....	0	0	0	1	0	0	0	0	0
Toledo.....	0	0	0	0	0	1	0	0	0
Illinois:									
Chicago.....	1	2	0	0	0	0	1	0	0
Michigan:									
Flint.....	1	0	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee.....	0	0	1	1	0	0	0	0	0
<b>WEST NORTH CENTRAL.</b>									
South Dakota:									
Sioux Falls.....	0	0	0	1	0	0	0	0	0
<b>SOUTH ATLANTIC.</b>									
Maryland:									
Baltimore.....	0	0	3	0	0	1	0	0	0
West Virginia:									
Huntington.....	0	1	0	0	0	0	0	0	0
South Carolina:									
Charleston.....	0	0	0	0	0	2	0	0	0
Columbia.....	0	0	0	0	10	2	0	0	0
Georgia:									
Atlanta.....	0	0	0	0	0	1	0	0	0
Florida:									
Tampa.....	0	0	0	0	1	0	0	0	0
<b>EAST SOUTH CENTRAL.</b>									
Tennessee:									
Nashville.....	0	1	0	0	0	1	0	0	0
Alabama:									
Mobile.....	0	0	1	0		0	0	0	0
<b>WEST SOUTH CENTRAL.</b>									
Louisiana:									
New Orleans.....	0	0	0	0	0	0	0	1	0
Shreveport.....	0	0	0	0	0	1		0	0
Texas:									
Dallas.....	0	0	0	0	1	0	0	0	0
San Antonio.....	0	1	0	0	0	0	0	0	0
<b>MOUNTAIN.</b>									
Colorado:									
Denver.....	0	0	0	1	0	0	0	0	0
<b>PACIFIC.</b>									
California:									
Los Angeles.....	1	0	0	0	0	0	1	0	0
San Francisco.....	0	0	2	3	0	0	0	0	0

The following table gives a summary of the reports from 105 cities for the nine-week period ended April 19, 1924. The cities included in this table are those whose reports have been published for all nine weeks in the Public Health Reports. Eight of these cities did not report deaths. The aggregate population of the cities reporting cases was estimated at nearly 29,000,000 on July 1, 1923, which is the latest date for which estimates are available. The cities reporting deaths had more than 28,000,000 population on that date. The number of cities included in each group and the aggregate population are shown in a separate table below.

*Summary of weekly reports from cities, February 17 to April 19, 1924.*

DIPHTHERIA CASES.

	1924, week ended—								
	Feb. 23.	Mar. 1.	Mar. 8.	Mar. 15.	Mar. 22.	Mar. 29.	Apr. 5.	Apr. 12.	Apr. 19.
Total.....	1,075	1,103	1,028	1,052	1,113	1,038	1,039	1,005	1,003
New England.....	109	125	86	110	135	103	105	102	99
Middle Atlantic.....	394	388	351	401	415	391	383	384	374
East North Central.....	225	230	218	234	229	200	219	210	211
West North Central.....	102	186	114	176	86	66	74	60	60
South Atlantic.....	31	54	43	37	61	42	61	52	52
East South Central.....	13	11	9	12	17	10	17	8	14
West South Central.....	34	34	34	18	21	32	23	24	30
Mountain.....	27	19	24	24	25	31	30	40	52
Pacific.....	140	156	149	140	124	163	127	125	111

MEASLES CASES.

Total.....	6,002	7,258	7,110	6,946	7,026	6,590	6,070	6,247	5,178
New England.....	294	469	356	460	430	443	374	401	353
Middle Atlantic.....	1,388	1,838	1,971	2,258	2,467	2,354	2,394	2,647	2,347
East North Central.....	322	476	541	604	659	674	606	838	675
West North Central.....	835	1,056	1,051	1,112	925	766	569	415	359
South Atlantic.....	578	683	801	579	675	621	572	626	487
East South Central.....	163	263	155	196	231	173	126	156	159
West South Central.....	738	781	693	410	514	590	354	323	201
Mountain.....	871	879	819	739	634	444	405	241	179
Pacific.....	813	813	723	588	491	525	470	600	418

SCARLET FEVER CASES.

Total.....	1,677	1,873	1,934	1,916	1,928	1,966	1,737	1,822	1,646
New England.....	301	330	387	413	337	363	312	326	253
Middle Atlantic.....	450	519	532	520	532	532	517	498	474
East North Central.....	317	380	347	349	376	370	346	345	334
West North Central.....	272	250	253	249	270	254	184	230	222
South Atlantic.....	142	188	209	175	221	202	200	218	189
East South Central.....	12	12	28	22	17	30	11	18	16
West South Central.....	8	9	11	19	13	17	15	26	25
Mountain.....	24	30	25	27	22	28	16	20	19
Pacific.....	151	155	142	142	140	170	136	141	114

<sup>1</sup> Figures for Kansas City, Mo., estimated. Report not received at time of going to press.

<sup>2</sup> Figures for Fort Smith, Ark., estimated.

<sup>3</sup> Figures for San Francisco, Calif., estimated.

<sup>4</sup> Figures for Seattle, Spokane, and Tacoma, Wash., estimated.



## Summary of weekly reports from cities, February 17 to April 19, 1924—Continued.

## SMALLPOX CASES.

	1924, week ended—								
	Feb. 23.	Mar. 1.	Mar. 8.	Mar. 15.	Mar. 22.	Mar. 29.	Apr. 5.	Apr. 12.	Apr. 19.
Total.....	486	521	488	522	565	602	544	537	473
New England.....	0	0	0	0	0	0	0	1	1
Middle Atlantic.....	0	0	1	2	0	6	1	1	0
East North Central.....	101	145	160	125	186	162	153	141	164
West North Central.....	65	151	56	76	77	72	52	61	41
South Atlantic.....	117	121	117	144	123	171	116	98	93
East South Central.....	9	35	35	25	25	38	49	45	26
West South Central.....	14	4	2	5	6	7	10	4	5
Mountain.....	2	11	11	3	4	7	8	4	10
Pacific.....	178	154	106	142	144	139	155	182	133

## TYPHOID FEVER CASES.

Total.....	52	49	46	56	60	76	51	53	55
New England.....	5	8	7	3	2	4	1	4	4
Middle Atlantic.....	8	11	16	20	19	26	9	21	17
East North Central.....	8	9	8	11	8	7	7	7	7
West North Central.....	0	11	3	11	5	5	7	2	6
South Atlantic.....	11	7	3	8	1	11	9	10	4
East South Central.....	4	4	1	7	13	10	1	1	4
West South Central.....	6	3	2	3	2	8	9	2	2
Mountain.....	2	1	2	0	1	1	2	1	4
Pacific.....	8	5	4	3	9	4	6	5	5

## INFLUENZA DEATHS.

Total.....	99	96	118	107	85	96	97	94	80
New England.....	4	3	5	10	5	3	6	3	3
Middle Atlantic.....	36	33	45	37	28	45	44	35	31
East North Central.....	18	14	19	23	13	11	20	25	14
West North Central.....	4	12	1	13	3	4	2	7	4
South Atlantic.....	10	13	15	7	15	10	3	8	6
East South Central.....	12	10	15	16	9	8	13	6	11
West South Central.....	8	15	12	8	8	10	6	3	4
Mountain.....	2	2	4	1	2	2	1	2	4
Pacific.....	5	4	2	2	2	3	2	5	3

## PNEUMONIA DEATHS.

Total.....	1,191	1,165	1,218	1,194	1,173	1,204	1,251	1,221	1,101
New England.....	87	84	71	85	67	58	75	71	61
Middle Atlantic.....	461	469	516	466	495	525	500	494	474
East North Central.....	226	235	221	240	226	255	286	258	232
West North Central.....	50	149	62	166	54	72	71	74	64
South Atlantic.....	171	166	177	161	152	111	125	158	118
East South Central.....	65	55	61	55	69	47	61	53	57
West South Central.....	71	55	62	61	56	61	67	43	43
Mountain.....	27	19	14	31	20	37	39	32	25
Pacific.....	33	33	34	29	34	38	27	38	27

<sup>1</sup> Figures for Kansas City, Mo., estimated. Report not received at time of going to press.

<sup>2</sup> Figures for Fort Smith, Ark., estimated.

<sup>3</sup> Figures for San Francisco, Calif., estimated.

<sup>4</sup> Figures for Seattle, Spokane, and Tacoma, Wash., estimated.

Number of cities included in summary of weekly reports and aggregate population of cities in each group, estimated as of July 1, 1923.

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.
Total.....	105	97	28,898,350	28,140,934
New England.....	12	12	2,698,746	2,698,746
Middle Atlantic.....	10	10	10,304,114	10,304,114
East North Central.....	17	17	7,032,535	7,032,535
West North Central.....	14	11	2,515,330	2,381,454
South Atlantic.....	22	22	2,566,901	2,566,901
East South Central.....	7	7	911,885	911,885
West South Central.....	8	6	1,124,564	1,023,013
Mountain.....	9	9	546,445	546,445
Pacific.....	6	3	1,797,830	1,275,841

## FOREIGN AND INSULAR.

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### CANARY ISLANDS.

#### Plague—Santa Cruz de Teneriffe.

A case of plague was reported at Santa Cruz de Teneriffe, Canary Islands, April 8, 1924.

### CHILE.

#### Mortality—Concepcion—Month of February, 1924.

During the month of February, 1924, 257 deaths, including 5 still births, were reported at Concepcion, Chile. Of these, 138 deaths occurred in children under one year of age. The principal causes of death were stated as follows: Broncho-pneumonia, 3; cancer, 5; croup, 3; heart disease, 16; meningitis, 4; pneumonia, 89; tuberculosis, 13; typhoid fever, 1. (Population, officially estimated, 64,780.)

### ECUADOR.

#### Plague.

During the period March 16–31, 1924, plague was reported in Ecuador as follows: *Eloy Alfaro*, 1 case, 1 death; *Guayaquil*, 9 cases, 1 death.

#### Plague-Infected Rats—Guayaquil.

During the period under report there were taken at Guayaquil 16,389 rats, of which number 39 rats were found plague infected.

#### Typhoid Epidemic Due to Polluted Water—Quito.

The unusual drought which prevailed in Ecuador in the Province of Pichincha and the Sierra in general, lasting from the fall of 1923 to the middle of February, 1924, resulted in a shortage of drinking water in Quito and a resort to the use of some old polluted wells, followed by an outbreak of typhoid fever. Under date of March 29, 1924, the epidemic was reported to have abated, the rainy season having begun about the middle of February.

As a result of the lack of domestic water supply occasioned by the extended drought, the municipal authorities of Quito have made arrangements for an additional supply of water from a natural spring, amounting to 600 gallons per minute.

**EGYPT.****Status of Plague.**

During the period January 1 to March 27, 1924, 47 cases of plague with 31 deaths were reported in Egypt. Of these, 6 cases with 3 deaths were reported at Suez, the remainder being distributed in six provinces. For distribution of occurrence according to locality, see page 1101.

**LATVIA.****Typhus Fever—Libau.**

Under date of April 18, 1924, three cases of typhus fever were reported present at Libau, Republic of Latvia. It was stated that the cases were widely separated. The origin of the infection had not been determined.

**MADAGASCAR.****Plague—Month of February, 1924.**

During the month of February, 1924, 254 cases of plague with 223 deaths were reported in the Island of Madagascar. For distribution of occurrence according to locality, see page 1101.

**MEXICO.****Smallpox—Chicken Pox—Salina Cruz.**

Information dated April 12, 1924, shows the occurrence of 1 case of smallpox with 1 death reported at Salina Cruz, Mexico, from April 1 to date, and 9 cases of chicken pox reported present.

**VACCINATION.**

Information of the same date shows 739 persons reported vaccinated at Salina Cruz from April 4 to 12, 1924.

**Smallpox—Mazatlan—Measures to Prevent Spread.**

Under date of April 21, 1924, from 25 to 35 cases of smallpox were stated to be present in the city of Mazatlan, Mexico, and a few cases in the vicinity of the city. No mortality was reported. It was stated that vigorous measures were being enforced by the local authorities, including free vaccination administered to all persons and the prohibition of public gatherings.

**PARAGUAY.****Hookworm Campaign Begun at Asuncion.<sup>1</sup>**

According to information dated March 17, 1924, active operations of the five-year hookworm campaign to be carried out in Paraguay by

<sup>1</sup> See Public Health Reports, Apr. 18, 1924, p. 846.

the Paraguayan Government and the International Health Board have just been begun in Asuncion. Free treatments numbering from 50 to 150 per day are being given at the Asuncion office, each case receiving three treatments at intervals of a week or 10 days. Within a short time a branch clinic is to be opened in one of the outlying towns to the south or east of Asuncion, thus covering the zone of greatest population in Paraguay. The more distant and thinly populated districts will be dealt with later.

**PERU.**

**Plague—March, 1924.**

During the month of March, 1924, 67 cases of plague with 23 deaths were reported in localities on the coast of Peru. For distribution according to locality, see page 1101.

**POLAND.**

**Typhus Fever—Pomerellen—Danzig-Polish Frontier.**

Under date of April 17, 1924, typhus fever was reported at Pomerellen, Poland, with 17 cases and four deaths occurring from January 8 to March 23, 1924. The locality is situated near the Danzig frontier.

**VIRGIN ISLANDS.**

**Communicable Diseases—Month of March, 1924.**

Communicable diseases were reported in the Virgin Islands of the United States during the month of March, 1924, as follows:

Island and disease.	Cases.	Remarks.	Island and disease.	Cases.	Remarks.
St. Thomas and St. John:			St. Croix—Contd.		
Dengue.....	1		Dengue.....	1	
Gonorrhoea.....	4		Dysentery.....	2	Entamebic.
Pellagra.....	3	From St. John, one.	Filariasis.....	11	Bancrofti.
Tuberculosis.....	1	Chronic pulmonary.	Gonorrhoea.....	7	
Uncinariasis.....	3	Necator americanus. Imported.	Syphilis.....	13	Twelve secondary; of brain, one.
St. Croix:			Trachoma.....	1	
Chancroid.....	4		Tuberculosis....	2	Chronic pulmonary.
Chicken pox.....	2				

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

The reports contained in the following tables must not be considered as complete or final as regards either the lists of countries included or the figures for the particular countries for which reports are given.

### Reports Received During Week Ended May 9, 1924.<sup>1</sup>

#### CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
India				Feb. 24-Mar. 1, 1924: Cases, 18,301; deaths, 10,593.
Calcutta	Mar. 16-22	44	38	
Rangoon	do	2	2	
Indo-China:				
Saigon	Mar. 9-15	1	1	
Siam:				
Bangkok	do	2	1	

#### PLAGUE.

Canary Islands:				
Santa Cruz de Tenerife	Apr. 8	1		
Celebes:				
Macassar	Feb. 20-Mar. 1	5	1	Including Menado.
Ecuador:				
Eloy Alfaro	Mar. 16-31	1	1	Rats taken, 16,389; found infected, 3.
Guayaquil	do	9	1	
Egypt:				Jan. 1-Mar. 27, 1924: Cases, 47; deaths, 31.
City—				
Suez	Jan. 1-Mar. 27	6	3	
Province—				
Charkieh	do	1	1	
Fayoum	do	1	1	
Girgeh	do	4	2	
Kalioubieh	do	1		
Menoufieh	do	30	18	
Minia	do	4	3	
India				Feb. 24-Mar. 1, 1924: Cases, 9,712; deaths, 7,313.
Bombay	Mar. 9-22	87	68	
Calcutta	Mar. 16-22	1	1	
Karachi	Mar. 23-29	12	11	
Madras Presidency	Mar. 9-15	16	18	
Rangoon	Mar. 16-22	7	6	
Indo-China:				
Saigon	Feb. 24-Mar. 1	1	1	Including 100 square kilometers of surrounding country.
Iraq:				
Bagdad	Feb. 24-Mar. 22	18	9	
Java:				
East Java—				
Scrabaya	Feb. 24-Mar. 1	1	1	
Madagascar:				
Tananarive Province				Feb. 1-29, 1924: Cases, 254; deaths, 223. Bubonic, pneumonic, septicemic.
Ambatondrazaka	Feb. 1-15	8		District. Type, pneumonic.
Ambositra	Feb. 1-29	8	1	Do.
Other localities	do	229	214	
Tananarive Town	do	9	8	
Peru				Mar. 1-31, 1924: Cases, 67 deaths, 23.
Locality—				
Ayabaca	Mar. 1-31	4		
Barranco	do	1		
Callao	do	3	1	
Canete	do	12	5	
Casma	do	2	1	
Guadalupe	do	2	1	
Huacho	do	2	2	
Huaral	do	3	3	
Huarmey	do	2	1	
Lambayeque	do	2		
Lima (city)	do	12	6	
Lima (country)	do	5	1	
Mollendo	do	1	1	
More	do	7		
Salaverry	do	1		
Trujillo (country)	do	8	1	
Siam:				
Bangkok	Mar. 9-15	2	2	

<sup>1</sup>From medical officers of the Public Health Service, American consuls, and other sources.

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

**Reports Received During Week Ended May 9, 1924—Continued.**

**SMALLPOX.**

Place.	Date.	Cases.	Deaths.	Remarks.
Brazil:				
Rio de Janeiro.....	Mar. 23-29.....	1		
Canada:				
Alberta—				
Calgary.....	Apr. 13-19.....	3		
Manitoba—				
Winnipeg.....	do.....	1		
China:				
Chungking.....	Mar. 9-22.....			Present.
Manchuria—				
Harbin.....	Mar. 18-24.....	1		
Gibraltar.....	Apr. 6-13.....	1		
India:				
Bombay.....	Mar. 9-22.....	197	97	Feb. 24-Mar. 1, 1924: Cases, 948; deaths, 764.
Calcutta.....	Mar. 16-22.....	2	2	
Karachi.....	Mar. 23-29.....	16	6	
Madras.....	do.....	38	5	
Bangoon.....	Mar. 16-22.....	21	6	
Indo-China:				
Saigon.....	Feb. 24-Mar. 15.....	223	110	Including 100 square kilometers of surrounding territory.
Japan:				
Kobe.....	Apr. 1-7.....	1		
Taiwan Island.....	Mar. 21-31.....	1		
Mexico:				
Guadalajara.....	Mar. 1-31.....	5	2	Apr. 21, 1924: Cases from 25 to 35. In city and vicinity. No mortality reported.
Mazatlan.....				
Mexico City.....	Mar. 16-22.....	9		Nine cases chicken pox present.
Salina Cruz.....	Apr. 1-12.....	1	1	
Tampico.....	Apr. 11-20.....	3	3	
Vera Cruz.....	Apr. 14-20.....	2	5	
Persia:				
Teheran.....	Jan. 21-31.....		1	
Portugal:				
Lisbon.....	Mar. 24-Apr. 5.....	7	1	
Oporto.....	Apr. 6-12.....	7	3	
Spain:				
Valencia.....	do.....	23	3	
Syria:				
Damascus.....	Mar. 19-25.....	2		
Tunis:				
Tunis.....	Apr. 1-7.....	1		

**TYPHUS FEVER.**

Bulgaria:				
Sofia.....	Mar. 23-29.....			Paratyphus fever, 1 case.
China:				
Manchuria—				
Harbin.....	Mar. 18-24.....	1		
Hungary:				
Budapest.....	Mar. 30-Apr. 5.....	7	3	
Latvia:				
Libau.....	Apr. 18.....	3		
Mexico:				
Guadalajara.....	Mar. 1-31.....	3	2	
Mexico City.....	Mar. 16-22.....	11		
Palestine:				
Jaffa.....	Mar. 25-31.....	1		
Poland:				
Pomerellen.....	Jan. 8-Mar. 25.....	17	4	Locality on Danzig-Polish frontier.

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

Reports Received from December 29, 1923, to May 2, 1924.<sup>1</sup>

### CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
China:				
Hongkong.....	Nov. 18-24.....	1		
India:				
Do.....				Oct. 14-Dec. 22, 1923: Cases, 14,117; deaths, 9,148.
Bombay.....	Dec. 23-29.....	1	1	Dec. 30, 1923-Feb. 23, 1924: Cases, 10,882; deaths, 5,865
Do.....	Feb. 3-16.....	17	17	
Calcutta.....	Nov. 11-Dec. 29.....	85	69	
Do.....	Dec. 30-Mar. 15.....	340	276	
Madras.....	Nov. 25-Dec. 29.....	15	5	
Do.....	Dec. 30-Mar. 22.....	24	10	
Rangoon.....	Nov. 11-Dec. 29.....	8	5	
Do.....	Feb. 24-Mar. 15.....	5	4	
Indo-China:				
Saigon.....	Dec. 31-Jan. 5.....	1	1	Including 100 square kilometers in surrounding country.
Philippine Islands:				
City—				
Manila.....	Feb. 3-9.....	1	1	
Province—				
Cebu.....	Mar. 2-8.....	1	1	
Siam:				
Bangkok.....	Nov. 18-Dec. 8.....	4	2	
Do.....	Dec. 31-Feb. 23.....	7	4	
Turkey:				
Constantinople.....	Dec. 2-8.....		1	

### PLAGUE.

Azores:					
St. Michael Island.....	Oct. 20-Nov. 10.....	9		5	At localities 3 to 9 miles from port of Ponta Delgada.
Bolivia:					
La Paz.....	Oct. 1-31.....			3	
Do.....	Feb. 1-29.....			6	
Brazil:					
Bahia.....	Nov. 11-Dec. 22.....	5		3	
Do.....	Dec. 30-Feb. 16.....	6		6	
Porto Alegre.....	Feb. 10-16.....			1	
Rio de Janeiro.....	Jan. 20-26.....	1			
British East Africa:					
Kenya—					
Kisumu.....	Feb. 24-Mar. 8.....	1		1	
Mombasa.....	Oct. 14-20.....	1		1	Infected rats, 2. Dec. 9-15, 1923: Cases, 4; deaths, 2; removed from vessel arrived Dec. 11, 1923.
Do.....	Dec. 30-Jan. 5.....	1		1	
Nairobi.....	Nov. 1-21.....	40			In rural districts, several hundred.
Tanganyika:					
Do.....	Jan. 27-Feb. 9.....	8		5	To Nov. 24, 1923; Cases, 39; deaths, 25.
Uganda:					
Entebbe.....	Aug. 1-Oct. 31.....	734		719	
Do.....	Oct. 1-Dec. 31.....	251		239	
Do.....	Jan. 1-31.....	36		35	
Canary Islands:					
Las Palmas.....	Oct. 15-Nov. 15.....	14		14	
Santa Cruz de Teneriffe.....	Feb. 19-Mar. 20.....	4			
San Juan de la Rambla.....	Dec. 11.....	1			Locality 52 km. from Teneriffe.
Celebes Island	Nov. 30.....				Epidemic.
Ceylon:					
Colombo.....	Nov. 11-Dec. 29.....	31		21	Plague rodents, 24.
Do.....	Dec. 30-Mar. 1.....	75		71	Plague rodents, 31.
Chile:					
Antofagasta.....	Mar. 16-22.....	5			
China:					
Nanking.....	Dec. 16-29.....				Present.
Do.....	Dec. 30-Mar. 22.....				Do.
Ecuador:					
Guayaquil.....	Nov. 16-Dec. 31.....	45		13	Rats taken, 53,240; found infected, 133.
Do.....	Jan. 1-Mar. 15.....	96		31	Rats taken, 93,454; found infected, 453.

<sup>1</sup> From medical officers of the Public Health Service, American consuls, and other sources.

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

Reports Received from December 29, 1923, to May 2, 1924—Continued.

## PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.	
Ecuador—Continued.					
Jipijapa	Nov. 16-Dec. 15			Present.	
Quevedo	Jan. 1-31	3	2		
Quito	Nov. 1-30	11	1		
Santa Rosa	Feb. 16-29			Do.	
Vino del Milagro	Dec. 1-15	1			
Egypt					
City—					
Alexandria	Year 1923	65	33	Jan. 1-Dec. 31, 1923: Cases, 1,519 deaths, 725. Jan. 1-Feb. 28, 1924: Cases, 39; deaths, 24.	
Cairo	do.	2	2		
Port Said	do.	51	29		
Suez	do.	46	24		
Do.	Jan. 2-Feb. 16	6	3		
Province—					
Assiout	Year 1923	370	211		
Beni Souef	do.	63	23		
Charkieh	Jan. 31	1	1		
Dakhalieh	Year 1923	2	2		
Fayoum	do.	34	9		
Do.	Feb. 18	1	1		
Gharbieh	Year 1923	23	9		
Girgeh	do.	337	193		
Do.	Jan. 17-Feb. 11	3	2		
Gizeh	Year 1923	3	4		
Kalioubiah	do.	76	10		
Do.	Jan. 6	1			
Kena	Year 1923	50	34		
Menoufieh	do.	290	98		
Do.	Jan. 2-Feb. 23	26	16		
Minia	Year 1923	106	44		
Do.	Feb. 5	1	1		
Greece:					
Kalamata	Apr. 18-24			Several deaths.	
Patras	do.			Do.	
Hawaii:					
Honokaa				Jan. 8-Mar. 14, 1924: Four plague-infected rodents.	
Paauihau				Dec. 14, 1923: One plague rat. Feb. 14, 1924: One plague rat.	
India					
Do.				Oct. 14-Dec. 29, 1923: Cases, 34,542; deaths, 23,778.	
Bombay	Oct. 28-Dec. 22	5	5	Dec. 30, 1923-Feb. 23, 1924: Cases, 45,128; deaths, 34,265.	
Do.	Dec. 30-Mar. 8	87	65		
Calcutta	Dec. 21-29	1	1		
Do.	Jan. 6-Mar. 15	4	4		
Karachi	Nov. 11-Dec. 29	42	33		
Do.	Dec. 30-Mar. 22	26	15		
Madras Presidency	Nov. 4-Dec. 29	1,657	1,021		
Do.	Jan. 27-Mar. 22	608	384		
Rangoon	Jan. 27-Feb. 16	20	15		
Do.	Dec. 30-Mar. 15	104	96		
Indo-China:					
Saigon	Oct. 28-Dec. 8	19	6	ncluding 100 square kilometers in surrounding country.	
Do.	Jan. 27-Feb. 2	1		Do.	
Iraq:					
Bagdad	Nov. 11-Dec. 29	8	6		
Do.	Jan. 6-Feb. 27	17	7		
Java					
Province—					
Djakakarta	Oct. 1-Dec. 31		146	Oct. 1-Dec. 31, 1923: Deaths, 2,908. Jan. 1-31, 1924: Deaths, 967.	
Do.	Jan. 1-31		44		
Kedoe	Oct. 1-Dec. 31		1,287		
Do.	Jan. 1-31		402		
Pekalongan	Oct. 1-Dec. 31		150		
Do.	Jan. 1-31		57		
Samarang	Oct. 1-Dec. 31		430		
Do.	Jan. 1-31		81		
Soerabaya	Oct. 1-Dec. 31		9		
Do.	Dec. 26-Feb. 2		26		
Soerakarta	Oct. 1-Dec. 31		886		
Do.	Jan. 1-31		372		
					Plague rats, 5.



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

Reports Received from December 29, 1923, to May 2, 1924—Continued.

## PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
<b>Madagascar:</b>				
Tananarive Province.....	Oct. 1-Dec. 31.....	324	272	Bubonic, pneumonic, septice- mic. July 1-Dec. 31, 1923— city and Province: Cases, 429; deaths, 367. Jan. 1-Feb. 4, 1924—city and Province: Cases, 271; deaths, 242.
Tananarive town.....	do.....	74	74	
Do.....	Jan. 29-Feb. 4.....	18	18	
<b>Paraguay:</b>				
Asuncion.....	Dec. 18.....	6	4	Nov. 1-Dec. 31, 1923: Cases, 38; deaths, 24. Jan. 1-Feb. 29, 1924: Cases, 95; deaths, 26.
<b>Peru:</b>				
<b>Locality—</b>				
Callao.....	Jan. 1-Feb. 29.....	4	1	Country.
Cañete.....	Nov. 1-30.....	1	1	
Do.....	Feb. 1-29.....	2	—	
Chancay.....	Dec. 1-31.....	2	—	
Chepen.....	Nov. 1-30.....	1	—	
Chiclayo.....	Nov. 1-Dec. 31.....	2	1	
Chilca.....	Jan. 1-31.....	1	—	
Guadalupe.....	Feb. 1-29.....	1	—	
Huacho.....	do.....	3	1	
Huaral.....	do.....	8	1	
Huarmey.....	Jan. 1-Feb. 29.....	20	3	
Lima (city).....	Nov. 1-Dec. 31.....	22	15	
Do.....	Jan. 1-Feb. 29.....	29	15	
Lima (country).....	Nov. 1-Dec. 31.....	8	7	
Do.....	Jan. 1-Feb. 29.....	6	1	
Lurin.....	do.....	2	—	
Mollendo.....	do.....	2	1	
Paita (city).....	do.....	1	1	
Paita (country).....	do.....	8	1	
Reque.....	do.....	4	—	
Sullana.....	do.....	2	—	
Trujillo.....	do.....	4	1	
<b>Portugal:</b>				
Lisbon.....	Dec. 13-21.....	7	—	Country.
Do.....	Dec. 31-Jan. 6.....	—	1	
<b>Portuguese West Africa:</b>				
<b>Angola—</b>				
Loanda.....	Oct. 1-Dec. 29.....	59	29	Country.
Do.....	Dec. 30-Feb. 2.....	—	4	
<b>Russia:</b>				
<b>Bukeeve Province.....</b>				
<b>Ural Provinces.....</b>				
Oct. 1, 1923-Feb. 4, 1924: Cases, 319; deaths, 294. 66 plague centers.				
Oct. 1, 1923-Feb. 4, 1924: Cases, 441. 4 plague centers.				
<b>Siam:</b>				
Bangkok.....	Nov. 4-Dec. 8.....	3	2	Country.
Do.....	Jan. 13-Mar. 1.....	2	2	
<b>Siberia:</b>				
<b>Transbaikalia—</b>				
Chita.....	Jan. 27.....	2	2	Pneumonic. Occurring in vet- erinary laboratory workers.
<b>Spain:</b>				
Malaga.....	Dec. 1-31.....	4	—	Country.
<b>Straits Settlements:</b>				
Penang.....	Jan. 27-Feb. 2.....	1	1	Country.
Singapore.....	Nov. 11-Mar. 15.....	4	4	
Do.....	Dec. 30-Mar. 1.....	14	11	
<b>Syria:</b>				
Beirut.....	Nov. 1-Dec. 10.....	3	—	Country.
Do.....	Jan. 1-10.....	1	—	
<b>Turkey:</b>				
Constantinople.....	Dec. 3-22.....	6	3	Country.
<b>Union of South Africa:</b>				
Dec. 16, 1923-Mar. 17, 1924: Cases, 222; deaths, 128 (Euro- pean cases, 18; deaths, 5).				
Reported Mar. 17, 1924: Cases, 11; deaths, 7.				
Cape Province.....	Dec. 9-15.....	—	—	Plague rodent found in vicinity Haarhoff's Kraal farm.

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

**Reports Received from December 29, 1923, to May 2, 1924—Continued.**

**PLAGUE—Continued.**

Place.	Date.	Cases.	Deaths.	Remarks.
Union of South Africa—Contd. Orange Free State.....				Jan. 27–Mar. 8, 1924: Cases, 74; deaths, 45. (White cases, 9; colored cases, 41; deaths, 14). Feb. 10: Death of case (white) previously reported. Total from Dec. 16, 1923–Mar. 1, 1924: Cases, 122 (white, 22); deaths, 70 (white, 10).
Hoopstad district.....	Feb. 3–9.....	1		
Kroonstad district.....	Dec. 16–27.....	7	3	Cases, 24; deaths, 15, reported since outbreak.
Do.....	Jan. 6–Feb. 9.....	43	20	
Winburg district.....	Feb. 3–9.....	1		
Wonderfontein farm.....	Dec. 2–8.....	4		Vicinity of Hoopstad. At Hoopstad, Dec. 9–15, 1923, one death of case previously reported.
Transvaal— Walmaransstad district.....	Mar. 2–8.....	3	1	White, one case. Apr. 2, 1924: Reported present in one locality.
West Africa.....				
On vessels: .....	Dec. 11.....	4	2	At Mombasa, British East Africa.
.....	Jan. 24.....	2		At Varna, Bulgaria, from Syrian port.

**SMALLPOX.**

Algeria: Algiers.....	Nov. 1–30.....	1		
Arabia: Aden.....	Dec. 16–22.....	1		Imported.
Do.....	Jan. 13–Mar. 29.....	6		Four imported.
Belgium: Brussels.....	.....do.....	10		
Bolivia: La Paz.....	Oct. 1–Dec. 31.....	45	15	
Do.....	Jan. 1–Feb. 29.....	11	8	
Brazil: Bahia.....	Jan. 6–12.....	2		
Pernambuco.....	Nov. 4–Dec. 1.....	15	3	
Do.....	Jan. 6–Feb. 23.....		8	
Porto Alegre.....	Dec. 23–29.....		1	
Do.....	Dec. 30–Mar. 8.....		2	
Rio de Janeiro.....	Nov. 18–24.....	3	4	
Do.....	Jan. 6–Mar. 8.....	3	2	
Sao Paulo.....	Sept. 3–9.....	1		
British East Africa: Tanganyika Territory.....	Sept. 30–Dec. 29.....	30	7	
Do.....	Jan. 6–12.....	2		
Uganda.....	Sept. 1–30.....	6	1	
Entebbe.....	Oct. 1–Dec. 31.....	5	1	
Zanzibar.....	Sept. 1–Oct. 31.....	116	18	Sept. 1–30, 1923: In areas 27 miles from town of Zanzibar. Oct. 1–31, 1923: In vicinity, 1 case, 1 death. In Mikotoni district, 30 cases, 14 deaths reported.
British South Africa: Northern Rhodesia.....				Dec. 4–31, 1923: Cases, 40; deaths, 5. Jan. 1–31, 1924: Cases, 50; deaths, 11; reported from Balorale, Kalabo, and Mankoya districts.
Do.....	Feb. 26–Mar. 3.....	1		
Canada: Alberta— Calgary.....	Jan. 27–Apr. 12.....	38		
British Columbia— Vancouver.....	Dec. 22–29.....	10		
Do.....	Dec. 30–Feb. 23.....	54		
Victoria.....	Feb. 10–Mar. 29.....	3		
Manitoba— Winnipeg.....	Nov. 25–Dec. 29.....	21		
Do.....	Dec. 30–Apr. 12.....	77		

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

Reports Received from December 29, 1923, to May 2, 1924—Continued.

## SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
<b>Canada—Continued.</b>				
<b>New Brunswick—</b>				
Frederickton.....				Feb. 1-29, 1924: Cases, 8.
Gloucester County.....	Mar. 2-Apr. 5.....	4		
Madawaska County.....	Dec. 8-15.....	1		
Restigouche County.....				Jan. 1-Feb. 29, 1924: Cases, 3.
Victoria County.....	Feb. 10-16.....	2		
Westmoreland County.....	Feb. 10-Apr. 5.....	4		
<b>Ontario</b>				
Amherstburg.....	Mar. 1-31.....	16	8	Jan. 1-Mar. 15, 1924: Cases, 348; deaths, 28.
Chapleau.....	do.....	13	1	
Cochrane.....	do.....	15	5	
Essex Border.....	do.....	12	6	
Fort William and Port Arthur.....	Dec. 16-29.....	3		Occurring at Fort William.
London.....	Feb. 3-Apr. 5.....	9		
North Bay.....	do.....	1		
Perth.....	Mar. 1-31.....	14		
Toronto.....	Jan. 17-Mar. 31.....	15	1	
Ottawa.....	Feb. 17-23.....	1		
Windsor.....	Feb. 1-Mar. 15.....	52	11	
<b>Quebec—</b>				
Montreal.....	Nov. 30-Feb. 23.....	7		
<b>Saskatchewan—</b>				
Regina.....	Dec. 9-15.....	1		
Do.....	Dec. 30-Feb. 23.....	6	1	
<b>Ceylon:</b>				
Colombo.....	Nov. 11-17.....	3	1	
Do.....	Jan. 20-Feb. 23.....	5	1	
<b>Chile:</b>				
Antofagasta.....	Jan. 6-19.....	4	1	
Concepcion.....	Oct. 1-Dec. 31.....		14	
Talcahuano.....	Nov. 26-Dec. 2.....	3		Dec. 22, 1923: Five cases present.
Valparaiso.....	Dec. 9-15.....	1		
Do.....	Jan. 13-Mar. 15.....	8		
<b>China:</b>				
Amoy.....	Nov. 18-Dec. 8.....		11	
Do.....	Jan. 6-Mar. 22.....		9	Including Kulangsu, 14 deaths; and in hospital, Feb. 9, 1924, more than 30 cases stated to be present
Antung.....	Dec. 31-Feb. 3.....	2	2	Present.
Canton.....	Dec. 23-Feb. 23.....			Present and endemic.
Chungking.....	Nov. 4-Dec. 29.....			Stated to be widespread.
Do.....	Dec. 30-Mar. 8.....			Present.
Foochow.....	Nov. 4-Dec. 15.....			Do.
Do.....	Dec. 31-Mar. 8.....			
Hongkong.....	Oct. 28-Dec. 29.....	718	630	
Do.....	Dec. 30-Mar. 1.....	530	549	
Kulangsu.....	Mar. 5.....			Do.
<b>Manchuria—</b>				
Dairen.....	Dec. 31-Jan. 20.....	2		
Do.....	Mar. 3-9.....	1		
Harbin.....	Nov. 12-Dec. 22.....	36		
Do.....	Jan. 1-Mar. 17.....	19	5	
Nanking.....	Dec. 2-15.....			Do.
Do.....	Dec. 30-Mar. 22.....			Do.
Shanghai.....	Dec. 29.....			Prevalent.
Do.....	Jan. 6-Mar. 15.....	29	72	Cases, foreign; deaths, Chinese and foreign.
<b>Chosen (Korea):</b>				
Chemulpo.....	Jan. 1-31.....	1		
Secul.....	Nov. 1-30.....	1		
Do.....	Feb. 1-29.....	2		
<b>Coombia:</b>				
Buenaventura.....	Nov. 18-Dec. 15.....	8		
Do.....	Apr. 3.....	1		
<b>Costa Rica:</b>				
Port Limon.....	Feb. 18-Apr. 5.....	2		
<b>Czechoslovakia</b>				
				Oct. 1-Dec. 31, 1923: Cases, 1; deaths, 1; occurring in Slovakia.
<b>Dominican Republic:</b>				
La Romana.....	Jan. 27-Mar. 22.....	14		
<b>Ecuador:</b>				
Esmeraldas.....	Nov. 16-30.....	4		
Guayaquil.....	Dec. 1-31.....	1		
Do.....	Jan. 1-Feb. 29.....	3		
Quito.....	Nov. 1-30.....	167	26	

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

Reports Received from December 29, 1923, to May 2, 1924—Continued.

### SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Egypt:				
Alexandria.....	Feb. 27-Mar. 18...	2	7	
Cairo.....	Jan. 1-7.....	1	1	
Port Said.....	Nov. 24-Dec. 2.....	1		
Estonia.....				Nov. 1-Dec. 31, 1923: Cases, 38. Jan. 1-31, 1924: Cases, 9.
France:				
Cherbourg.....	Feb. 9-15.....	1		British seaman.
Gibraltar.....	Mar. 3-9.....	1		
Great Britain:				
Liverpool.....	Mar. 2-8.....	1		In family of seaman recently returned from Oporto, Portugal.
Greece:				
Saloniki.....	Oct. 22-Dec. 30.....		11	
Do.....	Dec. 31-Feb. 24.....	4	3	
Guadeloupe (West Indies)				Jan. 2-16, 1924: Present.
Abymes.....	Feb. 16.....			Present. Vicinity of Point a Pitre.
Basse Terre.....	Dec. 18.....			Present.
Do.....	Jan. 12-Feb. 16.....			Do.
Marie Galante Island.....	Dec. 18.....			Off shore island; present.
Do.....	Feb. 16.....			Present. Estimated 60 cases.
Moule.....	Jan. 12-Feb. 16.....			Present.
Point a Pitre.....	Dec. 18.....			Present in vicinity.
Haiti:				
Cape Haitien.....	Feb. 3-9.....	3		Mar. 9-15, 1924: 2 cases in hospital.
Hinche.....	Feb. 10-16.....	1		
Port au Prince.....	Feb. 17-Mar. 1.....	2	1	Developed at Limbe, Haiti.
India:				
Do.....				Oct. 14-Dec. 29, 1923: Cases, 9,720; deaths, 2,241.
Bombay.....	Oct. 28-Dec. 29.....	55	25	Dec. 30, 1923-Feb. 23, 1924: Cases, 19,073; deaths, 4,279.
Do.....	Dec. 30-Mar. 18.....	458	221	
Calcutta.....	Dec. 16-29.....	4	4	
Do.....	Dec. 30-Mar. 8.....	8	7	
Karachi.....	Dec. 30-Mar. 22.....	44	10	
Madras.....	Nov. 4-Dec. 29.....	23	3	
Do.....	Dec. 30-Mar. 22.....	211	13	
Rangoon.....	Nov. 4-Dec. 29.....	12	4	
Do.....	Dec. 30-Mar. 15.....	37	9	
Indo-China:				
City—				
Saigon.....	Nov. 4-Dec. 29.....	133	74	Including 100 square kilometers of surrounding country.
Do.....	Dec. 31-Feb. 23.....	352	201	
Iraq:				
Bagdad.....	Oct. 24-Dec. 29.....	46	28	
Do.....	Dec. 30-Feb. 16.....	44	33	
Italy:				
Trieste.....	Feb. 17-23.....	4		
Turin.....	Feb. 18-24.....	1		
Jamaica:				
Do.....				Nov. 25-Dec. 29, 1923: Cases, 115. Dec. 30, 1923-Mar. 29, 1924: Cases, 233. Reported as alastrim.
Kingston.....	Nov. 25-Dec. 29.....	3		
Do.....	Dec. 30-Mar. 8.....	8		
Japan:				
Kobe.....	Feb. 14-Mar. 27.....	14	6	
Taiwan.....	Jan. 1-Feb. 29.....	7		
Tokyo.....	Jan. 1-Mar. 22.....	135		To Mar. 14, 1924; Cases, 138.
Java:				
East Java—				
Soerabaya.....	Oct. 23-Dec. 29.....	348	60	
Do.....	Dec. 30-Feb. 23.....	150	27	
West Java—				
Batavia.....	Oct. 27-Dec. 28.....	65	13	
Do.....	Dec. 29-Feb. 15.....	31	6	
Latvia.....				Oct. 1-Dec. 31, 1923: Cases, 6. Jan. 1-Feb. 29, 1924: Cases, 5.
Malta.....	Feb. 1-29.....	1		
Mexico:				
Guadalajara.....	Jan. 27-Mar. 15.....		5	
Manzanillo.....	Dec. 4-10.....	5	1	
Mazatlan.....	Mar. 31-Apr. 13.....		4	
Mexico City.....	Nov. 25-Dec. 29.....	32		Including municipalities in Federal District.
Do.....	Jan. 30-Mar. 15.....	102	23	Do.
Monterey.....				Mar. 24, 1924, 11 cases officially announced.
Salina Cruz.....	Jan. 1-31.....	1		

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

## Reports Received from December 29, 1923, to May 2, 1924—Continued.

### SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Mexico—Continued.				
San Luis Potosi.....	Mar. 16-22.....		1	
Tampico.....	Jan. 21-Mar. 31.....	29		
Vera Cruz.....	Nov. 3-Dec. 30.....		4	
Do.....	Jan. 6-27.....	1	2	From Irapuato, 9; La Barra, 1. Jan. 21-Apr. 10, 1924: Cases, 36 (12 in soldiers or soldiers' families); deaths, 5.
Netherlands:				
Rotterdam.....	Jan. 20-26.....	3		
Palestine:				
Jaffa.....	Jan. 15-23.....	3		
Jerusalem.....	Feb. 18-25.....	1		
Persia:				
Teheran.....	Sept. 24-Dec. 23.....		4	
Do.....	Dec. 22-Jan. 20.....		1	
Poland.....				Sept. 23-Dec. 31, 1923: Cases, 83; deaths, 20. Jan. 1-19, 1924 Cases, 51; deaths, 10.
Portugal:				
Lisbon.....	Nov. 11-Dec. 29.....	19	10	Corrected report.
Do.....	Dec. 31-Mar. 29.....	91	16	
Oporto.....	Nov. 25-Dec. 29.....	39	23	
Do.....	Dec. 30-Mar. 22.....	82	45	
Portuguese East Africa:				
Lourenco Marques.....	Dec. 30-Jan. 5.....	2		
Portuguese West Africa:				
Angola—				
Loanda.....	Dec. 2-29.....		5	
Russia:				
Ukraine.....				Aug. 1-Sept. 30, 1923: Cases, 143.
Siam:				
Bangkok.....	Oct. 28-Dec. 8.....	33	18	Nov 25-Dec. 1, 1923: Epidemic.
Do.....	Dec. 30-Mar. 8.....	8	2	
Siberia:				
Dauria Station.....	Oct. 21.....			Present. Locality on Chita Railway, Manchurian frontier
Sierra Leone:				
Sherbro District—				
Tagbail.....	Nov. 1-15.....	3		
Spain:				
Barcelona.....	Nov. 15-Dec. 26.....		2	
Do.....	Jan. 3-Mar. 26.....		5	
Valencia.....	Nov. 25-Dec. 29.....	152	12	
Do.....	Dec. 30-Apr. 5.....	370	34	
Straits Settlements:				
Singapore.....	Dec. 16-29.....	2	1	
Do.....	Dec. 30-Jan. 26.....	3		
Switzerland:				
Basel.....	Jan. 27-Feb. 9.....	4		Corrected.
Berne.....	Nov. 17-Dec. 22.....	15		
Do.....	Jan. 6-Mar. 29.....	34	1	
Lucerne.....	Nov. 1-Dec. 31.....	60		
Do.....	Jan.-Feb.....	7		
Zurich.....	Jan. 27-Mar. 8.....	2		
Syria:				
Aleppo.....	Nov. 25-Dec. 1.....	1		In vicinity, at Djisir Choughour.
Beirut.....	Jan. 21-Feb. 20.....	2		
Damascus.....	Nov. 16-Dec. 15.....	7		
Do.....	Jan. 29-Mar. 3.....	29		
Tunis:				
Tunis.....	Oct. 27-Nov. 2.....	5	1	
Do.....	Jan. 8-Mar. 31.....	9	4	
Turkey.....				Dec. 1-31, 1923: Cases, 120; deaths, 15.
Constantinople.....	Nov. 11-Dec. 8.....	3		
Do.....	Jan. 6-Feb. 16.....	1	1	
Union of South Africa:				
Cape Province.....	Oct. 28-Dec. 8.....			Oct. 1-31, 1923: Colored, cases, 41; deaths, 2; white, cases, 3. Outbreaks.
Do.....	Jan. 20-Mar. 1.....			Do
Natal.....	Oct. 28-Nov. 3.....			Do
Orange Free State.....	Oct. 28-Nov. 24.....			Do
Do.....	Jan. 20-Feb. 23.....			Do
Transvall.....	Nov. 18-Dec. 1.....			Do
Do.....	Mar. 11-17.....			Do
Johannesburg.....	Nov. 25-Dec. 15.....	3		
Do.....	Feb. 3-23.....	2		

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

Reports Received from December 29, 1923, to May 2, 1924—Continued.

### SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Uruguay: Montevideo.....	Oct. 1-31.....	1		
Venezuela: Caracas.....	Jan. 22.....			Epidemic.
Margarita Island: Punta Piedra.....	Mar. 21.....	60		20 miles from mainland.
On vessels: Steamship Coppename.....	Mar. 19.....	1		At New Orleans from Puerto Barrios, Guatemala.
U. S. Naval Hospital ship Mercy.....	Apr. 1.....	1		At St. Thomas, Virgin Islands, from Culebra, P. I. Patient had been in Jamaica, W. I., two weeks previous. Case reported as alastrim.
S. S. Torres.....	Jan. 14.....	1		At New Orleans quarantine station from Tampico, Mexico, via ports. Case in seaman signed on at Galveston, Tex., on outward voyage.
S. S. Tupper.....	Jan. 20-26.....	1		At Gonaives, Haiti.
S. S. Vasari.....	Dec. 31.....	1		At Trinidad, West Indies, from Buenos Aires, Argentina. Vessel left Buenos Aires, Dec. 15, 1923, for New York, via Santos, Rio de Janeiro, Trinidad, Barbados.
Sch. Annie M. Parker.....	Jan. 23.....	3		At sea. Vessel abandoned and crew removed to vessel bound for Rotterdam. Patients removed at Liverpool, Feb. 28, bound for Newfoundland.

### TYPHUS FEVER.

Algeria: Algiers.....	Nov. 1-Dec. 31.....	7	3	
Do.....	Jan. 1-Mar. 10.....	11	5	
Bolivia: La Paz.....	Oct. 1-Dec. 31.....	43	5	
Do.....	Jan. 1-Feb. 29.....	16	1	
Brazil: Porto Alegre.....	Feb. 24-Mar. 1.....		1	
Bulgaria: Sofia.....				Nov. 18-Dec. 15, 1923: Paratyphus fever, cases, 17. Jan. 6-Mar. 22, 1924: Paratyphus fever, cases, 8.
Canary Islands: Teneriffe.....	Jan. 14-Feb. 17.....		2	
Ceylon: Colombo.....	Feb. 24-Mar. 1.....	1	1	Case from port.
Chile: Antofagasta.....	Dec. 2-8.....	4		
Concepcion.....	Oct. 1-Nov. 30.....		4	Dec. 11-24, 1923: Deaths, 3.
Do.....	Jan. 8-Feb. 25.....	2	3	In district, at 12 localities, 92 cases.
Iquique.....	Jan. 20-26.....		1	Dec. 5, 1923: 3 cases under treatment. Jan. 12, 1924: 1 case under treatment.
Talcahuano.....	Jan. 31-Feb. 23.....	4		Dec. 24, 1923: In hospital, 34 cases.
Valparaíso.....	Nov. 25-Dec. 15.....		29	Reports from two districts of the Province of Valparaíso.
Do.....	Dec. 30-Mar. 15.....		44	
China: Antung.....	Nov. 12-Dec. 30.....	5		
Chungking.....	Nov. 18-24.....			Present.
Do.....	Dec. 16-29.....			Endemic.
Do.....	Dec. 30-Feb. 16.....			Do.
Chosen: Chemulpo.....	Feb. 1-29.....	1	1	
Seoul.....	do.....	30	1	
Czechoslovakia.....				Oct.-Dec., 1923: Cases, 21.

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

Reports Received from December 29, 1923, to May 2, 1924—Continued.

### TYPHUS FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Danzig-Polish frontier: Mühlbanz .....	Mar. 6. ....			Present. Origin stated to be focus at Mallinia.
Ecuador: Quito .....	Nov. 1-30 .....	14	1	
Egypt: Alexandria .....	Nov. 19-Dec. 23 .....	3		Nov. 1-30, 1923: Paratyphus fever, cases, 8. Dec. 1-31, 1923: Typhus fever, cases, 15; paratyphus, cases, 4. January, 1924: Paratyphus fever, cases, 6. Dec. 1-15, 1923: Paratyphus fever, cases, 15. Feb. 15-29, 1924: Paratyphus, cases, 7.
Do. ....	Jan. 8-Mar. 18. ....	6		
Cairo .....	Sept. 10-Dec. 31 .....	39	11	
Esthonia .....				
Finland .....				
Germany: Coblenz .....	Jan. 27-Feb. 2 .....	1		
Greece: Athens .....	Jan. 11-Feb. 20 .....		7	
Saloniki .....	Nov. 26-Dec. 30 .....	7	3	
Hungary: Budapest .....	Jan. 27-Mar. 15 .....	23	7	July 1-Aug. 31, 1923: Cases, 24.
Java: East Java— Soerabaya .....	Dec. 9-29 .....	12		
Do. ....	Dec. 30-Jan. 5 .....	2		
Latvia .....				Oct. 1-Dec. 31, 1923: Cases, 22 paratyphus fever, 12; recurrent typhus, 3. Jan. 1-Feb. 29, 1924: Cases, 48. Paratyphus A, 1; B, 1. Recurrent, 1 case. Year, 1923; Cases, 819; deaths, 86; recurrent typhus, 13 cases.
Lithuania .....				
Mexico: Durango .....	Dec. 1-31 .....		2	
Do. ....	Jan. 1-Feb. 29 .....		3	
Guadalajara .....	Jan. 27-Mar. 29 .....	2	3	Feb. 1-29, 1924: Cases, 2; deaths, 1.
Mexico City .....	Nov. 25-Dec. 29 .....	86		Including municipalities in Federal District.
Do. ....	Dec. 30-Mar. 15 .....	61	8	Do.
San Luis Potosi .....	Jan. 17-23 .....		1	
Torreón .....	Feb. 1-Mar. 31 .....		6	
Netherlands: Amsterdam .....	Mar. 2-8 .....	2		
Norway: Stavanger .....	Dec. 25-31 .....	1		
Palestine: Jaffa .....	Jan 1-Feb. 26 .....	4		
Jerusalem .....	Feb. 19-28 .....	2		
Persia: Teheran .....	Sept. 24-Oct. 23 .....		1	
Poland .....				Sept. 23-Dec. 31, 1923: Cases, 947; deaths, 92; recurrent typhus, cases, 67; deaths, 1. Jan. 1-19, 1924: Cases, 470; deaths, 37; recurrent cases, 24.
Portugal: Oporto .....	Jan. 27-Feb. 2 .....	2		
Rumania: Kishineff District .....	Nov. 1-Dec. 31 .....	15		
Russia: Ukraine .....				Aug. 1-Sept. 30, 1923: Cases, 768. Recurrent typhus: Aug. 1-Sept. 30, 1923: Cases, 2,307.
Spain: Barcelona .....	Nov. 29-Dec. 12 .....		2	
Do. ....	Jan. 3-Feb. 13 .....		5	
Madrid .....	Dec. 1-31 .....		7	
Syria: Damascus .....	Jan. 27-Feb. 2 .....	1		
Tunis: Tunis .....	Feb. 5-11 .....	1		

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

**Reports Received from December 29, 1923, to May 2, 1924—Continued.**

**TYPHUS FEVER—Continued.**

Place.	Date.	Cases.	Deaths.	Remarks.
Turkey.....				Dec. 1-31, 1923: Cases, 41; deaths, 5
Constantinople.....	Nov. 11-Dec. 29...	15	1	
Do.....	Dec. 30-Feb. 23...	8		
Union of South Africa.....				Oct. 1-31, 1923: Colored, 287 cases, 59 deaths; white, 2 cases; total, 289 cases, 58 deaths. Jan. 1-31, 1924: Cases, 196; deaths, 25 (colored). Among white population 3 cases. Total, cases, 199; deaths, 25.
Cape Province.....				Oct. 1-31, 1923: Colored, cases, 245; deaths, 47
Do.....				Jan. 1-31, 1924: Cases, 93; deaths, 11. Feb. 24-Mar 17, 1924: Outbreaks.
Natal.....				Oct. 1-31, 1923: Colored, cases, 4; deaths, 3
Do.....				Jan. 1-31, 1924: Cases, 81; deaths, 11. Feb. 24-Mar 1, 1924: Outbreaks.
Durban.....	Nov. 24-Dec. 1...	73		Cases occurring among native stevedores in the harbor area of the port and confined to one barracks.
Orange Free State.....				Oct. 1-31, 1923: Colored, cases, 25; deaths, 8. Feb. 24-Mar. 1, 1924: Outbreaks.
Do.....				Jan. 1-31, 1924: Cases, 17; deaths, 3.
Kroonstad District.....	Jan. 20-26.....			Outbreaks on two farms.
Transvaal.....				Oct. 1-31, 1923: Colored, cases, 13.
Do.....				Jan. 1-31, 1924: Cases, 5; deaths, 1.
Johannesburg.....	Oct. 1-Dec. 31.....	3	4	
Do.....	Jan. 6-Feb. 16.....	7		
Fotschefstrom District.....	Jan. 20-26.....			Outbreaks on seven farms.
Venezuela:				
Maracaibo.....	Dec. 16-22.....		1	
Do.....	Feb. 17-Mar. 1.....		2	
Yugoslavia:				
Croatia—				
Zagreb.....	Dec. 2-15.....	3		
Do.....	Feb. 17-23.....	1		
Serbia—				
Belgrade.....	Nov. 25-Dec. 1.....	1		
On vessel:				
S. S. Malta Maru.....	Mar. 17.....	1		At Rotterdam, Netherlands, from South America.

**YELLOW FEVER.**

Brazil:				
Pernambuco City.....	Nov. 16.....	3	2	