PUBLIC HEALTH REPORTS

VOL. 41 JUNE 4, 1926 NO. 23

STUDIES ON THE ETIOLOGY OF EPIDEMIC ENCEPHALITIS. I. THE STREPTOCOCCUS

By ALICE C. EVANS, Associate Bacteriologist, Hygienic Laboratory, United States Public Health Service and WALTER FREEMAN, M. D., Senior Medical Officer, Director of Laboratories, St. Elizabeths Hospital, Washington, D. C., Professor of Neuropathology, George Washington University Medical School

Epidemic encephalitis is a newly recognized disease which is demanding increasing attention. It made its appearance in Vienna, Austria, during the winter of 1916–17, and from there spread to other countries. The first cases to be recognized in the United States occurred in the winter of 1918–19. Since then, the number of cases has steadily increased, and in the year 1924, 969 cases were reported in 40 cities of this country representing a population of about 22,500,000. The mortality was 50 per cent. Among those who survive the acute attack, many are later afflicted by motor disorders characterized by rigidity and tremor, or by spasmodic movements and often by salivation and other disturbances of the vegetative nervous system, and many develop changes of personality or other abnormal psychic traits which bring them to hospitals for the insane. During the summer of 1925, three patients suffering from chronic encephalitis died at St. Elizabeths Hospital, the Government hospital for the insane at Washington, D. C., and this report is on a bacteriologic study of material from these cases.

A brief survey of the various opinions in regard to the etiologic agent of epidemic encephalitis is of interest. Some of the early symptoms of encephalitis are similar to early symptoms of botulinus poisoning; hence, both in Austria and in England the disease was first mistakenly attributed to food intoxications. There has been much discussion of the relationship of epidemic encephalitis to epidemic influenza. There is a prevalent idea that encephalitis may be a sequel attending influenza, the pandemic having prepared the way by reducing resistance to the causative agent of encephalitis. On the other hand, there are those who believe that the influenza bacillus is itself responsible for encephalitis. Crofton has recently submitted evidence to support that hypothesis.

One of the earliest bacteriologic investigators of the disease was Von Wiesner who carried out his studies in Vienna in 1917. He

inoculated a monkey subdurally with an emulsion of brain from a fatal case of encephalitis lethargica. The animal sickened and died in 46 hours. At necropsy a meningo-encephalitis was found, and from the lesions a diplostreptococcus was cultivated which reproduced the disease in a second monkey and was highly virulent for a rabbit, causing death of the rabbit in 20 hours. Rosenow has also cultivated from a large number of cases of encephalitis a streptococcus which shows peculiar neurotropic properties and produces nervous symptoms in the rabbit, monkey, mouse, and guinea pig. Rosenow obtained his organism constantly from infected tonsils, teeth, or nasopharynx of patients during life and from the brain after death. Minute forms of the organism occurred, which passed through filters that held back *Serratia marcescens* (*Bacillus prodigiosus*).

The streptococcus to be described in this paper agrees with that of Von Weisner and with that of Rosenow in so far as the comparisons have been made.

Two groups of Italian workers also have cultivated, from cases of epidemic encephalitis, diplococci which appear to be the same as the one here described. Maggiora, Mantovani, and Tombolato obtained a diplococcus from the blood in three severe cases. It produced nervous symptoms when inoculated into guinea pigs, and could be transmitted from animal to animal. A few months later Ottolenghi, d'Antona, and Tonietti obtained a diplo-streptococcus from one of six cases of lethargic encephalitis. They identified their strain with the pleomorphic streptococcus of Von Wiesner, and with the diplococcus of Maggiora, Mantovani, and Tombolato.

Other investigators have cultivated streptococci from cases of encephalitis. Probably some of these investigators, possibly most of them, have cultivated the same organism as the one here described; but their descriptions are not sufficiently complete, or else a discrepancy occurs in their descriptions when applied to our organism, so that identification can not be made with certainty.

Reichert cultivated a pleomorphic streptococcus from the brain at necropsy in all of eight cases of epidemic encephalitis and he obtained the same organism from the heart blood in four cases. He is convinced of the identity of his organism with that of Von Wiesner, and his descriptions, in so far as they go, appear to justify that conclusion. But Reichert made no tests of the pathogenicity of his organism.

Stafford cultivated diplococci from the spinal fluid taken from two cases, and Cohn and Lauber cultivated a diplococcus from the blood of one case of encephalitis. The diplococci described by these investigators agree in general with the organism described in this paper. Animal experiments gave negative results. These investigators did not, however, make intracerebral inoculations, and their

negative results with inoculations made by other routes are not necessarily at variance with our results.

Brasher, Caldwell, and Coombe observed a Gram positive diplococcus in the cerebrospinal fluid from two cases of encephalitis. They were unable to obtain cultures.

Bradford, Bashford, and Wilson report the cultivation of a pleomorphic coccus from cerebrospinal tissue in cases of "acute infective polyneuritis." They claim to have reproduced the disease in monkeys by subdural inoculation of cultures. None of their cultures, however, could be carried beyond the fifth generation. The statement that their organism will not grow aerobically is contrary to the behavior of our cultures.

Loewe and Strauss carried out extensive experiments with a filterable organism obtained from brain, from nasopharyngeal mucous membrane, and from nasal washings from cases of epidemic encephalitis. They cultivated a streptococcuslike organism in tissue ascitic fluid medium, and were able to transmit the disease to monkeys and rabbits. Positive animal inoculations were obtained with the eleventh generation of this organism. Their results were later duplicated by Thalheimer. The statement of these investigators that their cultures would not grow on ordinary media disagrees with our results.

Several investigators, including Levaditi and Harvier, McIntosh, Doerr, and Schnabel, and Perdrau, have worked with strains of encephalitis virus which are passed from animal to animal by inoculations with the brain emulsions, or with filtrates of brain emulsions, without cultivation of the organism between passages. The confusion of the whole subject is shown by the fact that the disease caused in rabbits by these encephalitis viruses can not be distinguished from the disease caused by the virus obtained from cases of herpes. This similarity in the diseases caused by the encephalitic and herpes viruses was first observed by Doerr and Schnabel and has been confirmed by a number of investigators.

It is impossible, at the present stage of our knowledge, to correlate the results of those investigators who consider the pleomorphic streptococcus as the etiologic agent in epidemic encephalitis, with the results of those who fail to cultivate an organism from the virus. Certain claims common to the two groups suggest, however, that both may be working with the same organism. Both groups of workers produce the symptoms of encephalitis in experimental animals, with brain lesions similar to those in the human disease; both groups of workers are able to immunize experimental animals against their respective viruses; both groups of workers have found the agent of encephalitis in the nasopharynx of normal persons. Some of those investigators who have cultivated a pleomorphic

coccus have found minute forms which will pass through a filter capable of holding back ordinary bacteria.

There is an erroneous idea prevalent in regard to "filterable viruses" which may account for the failure of some investigators to cultivate the streptococcus of epidemic encephalitis—namely, the idea that bacteria of ordinary size can not occur in filterable forms, and, vice versa, that if an organism is filterable it can not also occur in forms comparable in size with ordinary bacteria. Consequently, when an investigator of a filterable virus finds ordinary sized bacteria in his medium, he is likely to discard it as "contaminated" without further consideration.

TECHNIQUE

The media used in these investigations are very simple. Anaerobic cultures are grown in a meat medium prepared like ordinary beef infusion broth; but instead of discarding the meat from which the broth is made, the ground meat particles are placed in the tubes to a depth of about 1 inch. After the medium has been inoculated, a cap of sterile melted vaseline is added.

Vitamin agar is prepared according to the ordinary method for plain infusion agar; but instead of filtering, the sediment is allowed to settle, and after the agar is hardened it is cut away. The agar thus made is a clear medium favorable for the growth of delicate organisms.

Plantings of tissue in meat medium were made with pieces about the size of a pea, or, in the case of blood, a few drops were planted. The meat medium alone was used for planting the human tissues. Those from the experimental animals were planted also on a series of three or four vitamin agar slopes. The first tube was smeared with the tissue, then without flaming the loop, the remaining tubes were planted in succession. If growth occurred, it could be recorded as sparse, moderate, or heavy, according to the number of colonies in the various tubes.

Intracerebral inoculations of rabbits were made with the broth from the meat medium cultures or with emulsions of brain. The brain was ground in a mortar and physiologic salt solution added to make an emulsion of approximately 10 per cent. The emulsion was then strained through gauze or filtered through a Mandler filter. The inoculum for rabbits was always 0.25 cubic centimeter. The rabbit was anesthetized with ether, and a cut about a half-inch long was made in the skin at the top of the head a little to the right of the median line. The skin was then drawn to the left, and the skull was trephined through the cut a little to the left of the median line. Inoculations were made into the brain tissue. Monkeys were inoculated intracerebrally in the same manner as the rabbits. The

amount of inoculum for the monkeys varied, however, and will be given in the protocols.

In the filtration experiments the efficiency of the filter was always tested by heavily inoculating the material with *Serratia marcescens* (*Bacillus prodigiosus*) from a young agar slope culture before placing it in the filter.

BACTERIOLOGIC INVESTIGATION

Two of the cases investigated gave negative results. From the third the cultures were obtained on which this paper is based.

The first case to come under this bacteriologic investigation (designated Case 2 in the report of cases) [1] died suddenly on June 4, 1925, nearly six years after the acute attack of the disease. Necropsy was performed 69 hours after death. Pieces removed from the spinal cord and from various parts of the brain were obviously contaminated, except that from the cerebral cortex, from which several strains of cocci were obtained. After preservation in glycerin for two days an emulsion of the mesencephalon was prepared, and intracerebral inoculations were made into one monkey and three rabbits. The monkey never showed definite nervous symptoms, but died of pneumonia about a month after inoculation. The rabbits all developed nervous symptoms and died or were chloroformed on the second, fifth, and ninth days, respectively, after inoculation. Seventeen more rabbits were inoculated intracerebrally with emulsions of the human mesencephalon or with cultures obtained from the human brain or from the brains of the rabbits which had shown nervous symptoms, or with emulsions of the brains of these rabbits. The results of these inoculations were negative except in one rabbit which was inoculated with culture and died on the fifth day after showing nervous symptoms. Further inoculations with this strain gave negative results.

The second case to be studied bacteriologically (designated Case 3 in the report of cases) died on July 19, 1925, more than four years after the onset of illness. Necropsy was performed 15 hours after death. Plantings were made in the meat medium at once, and the following day an emulsion was prepared with the mesencephalon which had been preserved in glycerin. Two monkeys and six rabbits were inoculated intracerebrally with the emulsion, and six rabbits were inoculated with cultures obtained from this human brain, with uniformly negative results.

The third case to be studied bacteriologically (designated Case 4 in the report of cases) died on August 15, 1925. The patient had suffered from two previous attacks of acute encephalitis, one in 1919 and one in 1923. The third attack began in July, 1925, and was characterized by high fever, which terminated fatally, with a tem-

[1] Detailed report of these cases will appear elsewhere.

perature of 107° F. Necropsy was performed two hours after death. A pleomorphic organism, highly virulent for rabbits and monkeys when inoculations are intracerebral, was cultivated from the mesencephalon and from the heart blood taken at necropsy, and it was also obtained from nasal washings taken a few days before death.

The remarkable pleomorphism of the organism suggests life cycles as complex as those of some of the higher fungi. It may be stated briefly that in one of the phases of its life history this organism is a spore-forming rod. The rod form produces not only spores, but also exceedingly minute, filterable, coccoid bodies which develop as buds on the outer walls of the rods. Under certain conditions these minute coccoid bodies enlarge and multiply as cocci. The detailed study of the rod form and other phases in the life history of the organism will be given in forthcoming publications. This report will be limited to observations on the streptococcus form of the organism—the form in which the virulence is highest and most stable.

The three strains of streptococcus obtained from Case 4 were designated P–95, P–104 and P–107. Strain P–95 was obtained from the nasal washings taken eight days before death. Two rabbits inoculated intracerebrally with the washings showed nervous symptoms and died or were chloroformed on the second and third days. Strain P–95 was obtained from the brain of one of these rabbits. It grew readily on the vitamin agar as well as in the meat medium.

Strain P–104 was obtained from the human heart blood taken at necropsy. Four tubes of meat medium were each planted with several drops of blood. Two days later they were examined, and all showed clouding, with gas. Stained smears showed a variety of forms. The subsequent demonstration of pleomorphic forms of the organism raises the question as to what extent these original cultures were contaminated. Two rabbits were inoculated intracerebrally with different cultures. One of these rabbits never showed any symptoms. The other rabbit showed nervous symptoms on the day following inoculation, and died on the second day. Cultures planted with the rabbit's brain showed pure growth of strain P–104, which proved to be identical with strain P–95. In the first and second culture generations of strain P–104 from the rabbit's brain, growth occurred on vitamin agar only when the inoculations were very heavy. In all subsequent plantings, growth has taken place readily on the vitamin agar, even in the first generation after animal passage.

Strain P–107 was obtained from the human mesencephalon taken at necropsy. Six tubes of meat medium were planted with pieces of mesencephalon, and all showed clouding two days later, when first examined. Three of the six cultures were inoculated intracerebrally into rabbits, and all were found to be virulent. The culture from

which strain P–107 was derived was incubated for two days, placed in the ice box for a week, then, after five days more of incubation, it was inoculated intracerebrally into a rabbit. On the following morning the rabbit was found dead. (Death had occurred in less than 18 hours.) Meat medium and vitamin agar planted with the brain showed pure growth of P–107.

Plantings in meat medium were made also from the cortex and medulla of Case 4. Of 18 tubes planted with cortex, 2 showed growth. Both of these cultures proved to be avirulent when inoculated intracerebrally into rabbits. Of 5 tubes planted with medulla, 4 showed growth. Two of the cultures obtained from the medulla were inoculated intracerebrally into rabbits and were found to be avirulent.

The negative results obtained with cultures from the cortex and medulla are in striking contrast with the positive results obtained with cultures from the mesencephalon. These findings indicate that the virulent organism was localized in the mesencephalon, which is known to be the seat of the most marked pathologic alterations. There is evidence, however, that it was only sparsely seeded in the mesencephalon. After the brain had been preserved in glycerin for three days, pieces of the medulla and mesencephalon were emulsified together and the emulsion was inoculated intracerebrally into three rabbits. One rabbit was found dead three and one-half hours later. The cause of death was not determined. The two remaining rabbits never showed any symptoms. It will be shown further on that rabbits withstand light inoculations of the organism without showing symptoms.

DESCRIPTION OF THE STREPTOCOCCUS

When heavily seeded on vitamin agar the streptococcus grows in a delicate film of minute colonies scarcely visible to the naked eye. When the colonies are well isolated they may attain the size of an ordinary streptococcus colony. On blood agar there is a small zone of slight hemolysis with a greenish tinge. The organism will grow on plain agar and in plain broth. Litmus milk is curdled in two days. Broth cultures with an initial pH value of 7.3 are reduced to about pH 6.6 with lactose present, and to about pH 4.8 with dextrose, maltose, or saccharose present. Salicin, raffinose, mannite, and inulin are not fermented.

In its morphology this streptococcus displays some peculiar characteristics. In meat medium culture, and, more markedly, in the condensation water of an agar slope that has been smeared with tissue, the diplococci grow in long parallel chains forming ribbons of two, three, or more filaments. (Fig. 1.) The chains of a ribbon have a tendency to separate and bulge here and there, making rings which may be more or less angular; and single chains may be com-

monly found with one end curled around to form a closed loop. Occasionally very large, deeply stained forms may be found in a chain of ordinary coccus forms. These large forms within the chains usually occur in pairs. (Fig. 2.)

On blood agar slope the streptococcus grows not only as a diplococcus, but also in masses made up of minute deeply stained bodies surrounded by a lightly stained substance. The appearance is that of a plasmodium dotted with myriads of minute nuclei.

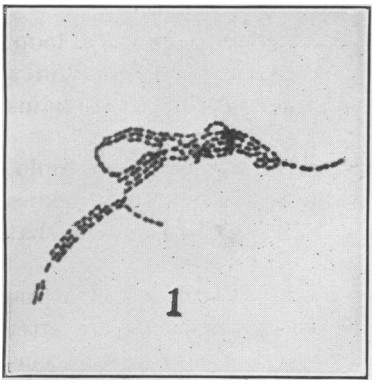
Cultures on agar slopes that have been smeared with the organs of a rabbit which has died following intracerebral inoculation after having been partially protected by previous intravenous inoculations (the protection experiments will be discussed further on) show a great variety of pleomorphic forms. Diphtheroids and giant cocci are common (fig. 3); and deeply stained bodies of irregular size and shape may be found embedded in lightly stained material of indefinite form (fig. 4).

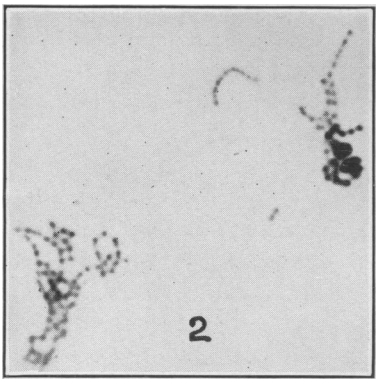
In smears of the brain of a rabbit which has succumbed to a rapidly fatal infection, cocci varying greatly in size may be found. (Fig. 5.) The largest cocci in Figure 5 are the size of ordinary cocci. It is obvious that if an emulsion of a brain containing these minute cocci were passed through a filter with pores just small enough to hold back bacteria of ordinary size, the smallest forms to be seen in the photograph would pass through the filter.

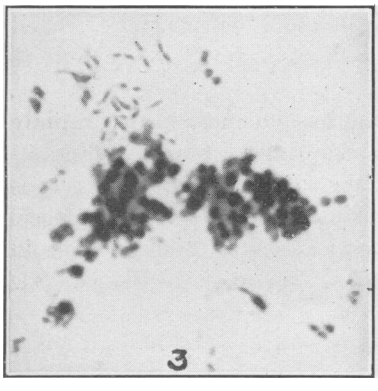
Figure 6 shows the streptococcus in a smear of the brain of a monkey which died of the infection.

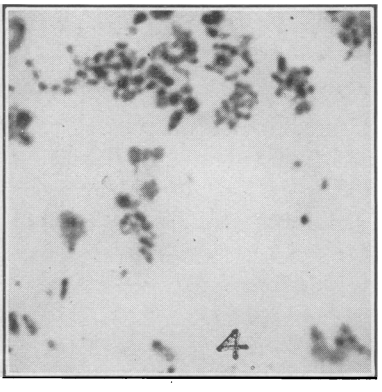
In smears prepared from agar slopes or from meat medium the streptococcus is variable to Gram's stain. When grown in fluid culture it is peculiarly resistant to staining. When Gram-safranin is used it commonly happens that no organisms, or only a few, may be found in smears prepared from meat medium cultures that are heavily clouded. The abundance of cocci that would be expected in smears prepared from heavily clouded cultures can rarely be found when the smears are stained with Gram-safranin. Cultures that are completely resistant to the Gram-safranin may present an unusual picture when the smears are stained with Loeffler's methylene blue. Some of the cocci may be stained a deep blue, and others may be unstained, appearing as hyaline bodies against a pale blue background. Sometimes the hyaline bodies are irregularly distributed among the deeply stained cocci in a chain. The organisms are readily stained by Giemsa's method.

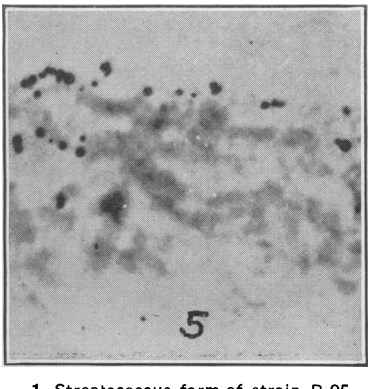
Retention of virulence.—In an infected rabbit's brain preserved in glycerin at about 4° C. the virulence of the streptococcus had decreased slightly on the nineteenth day, notably on the thirty-sixth day, and by the forth-eighth day there had been a complete loss of

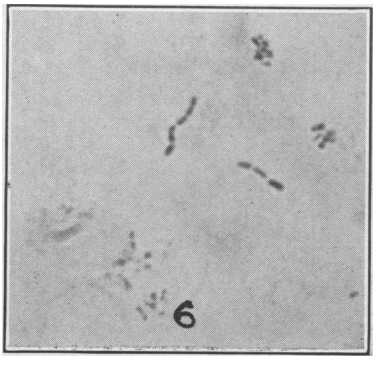




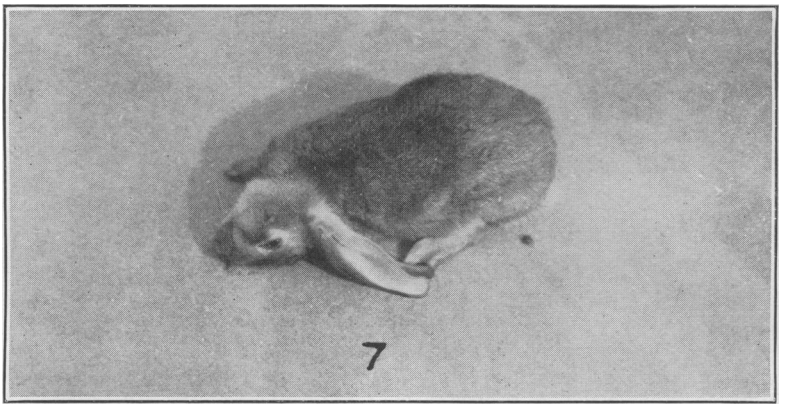






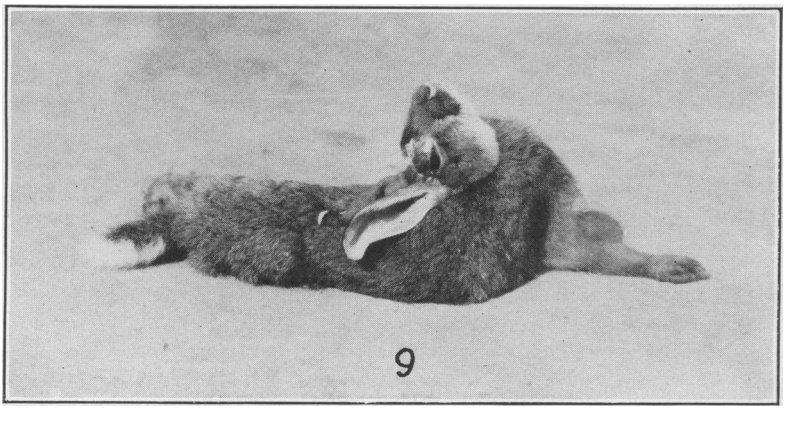


1. Streptococcus form of strain P-95. 24-hour culture in meat medium. Stained by Giemsa's method. (X 1,200, approx.)
2. Streptococcus form of strain P-104. 24-hour culture in meat medium planted with rabbit's brain. Stained with methylene blue. (X 2,900, approx.)
3 and 4. Pleomorphic forms of strain P-95. 48-hour culture on agar slope planted with liver of a rabbit which had been partially protected by several intravenous inoculations previous to the fatal dose given intracerebrally. Stained by Giemsa's method. (X 2,900, approx.)
5. Strain P-95 in smear of brain of rabbit. Stained with Gram-safranin. (X 2,900, approx.)
6. Strain P-95 in smear of brain of monkey 38. Stained with Gram-safranin. (X 2,000, approx.)

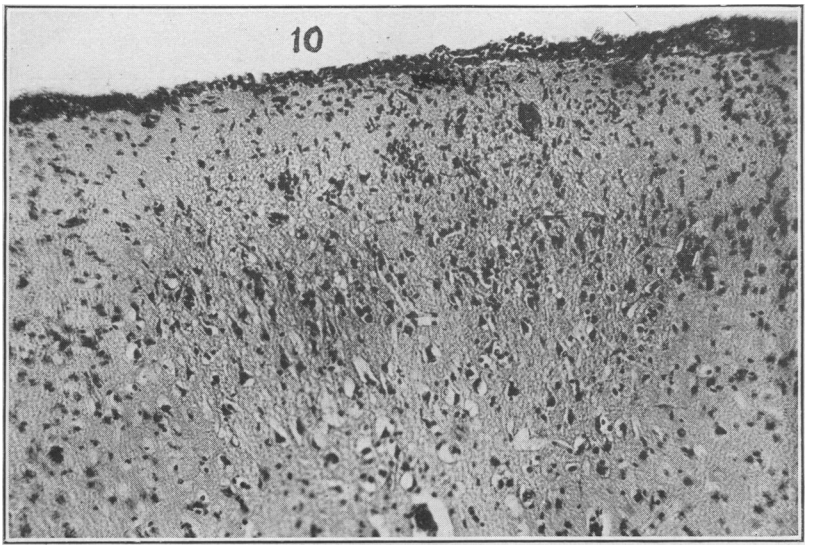


Rabbit 50 (see Table 2)

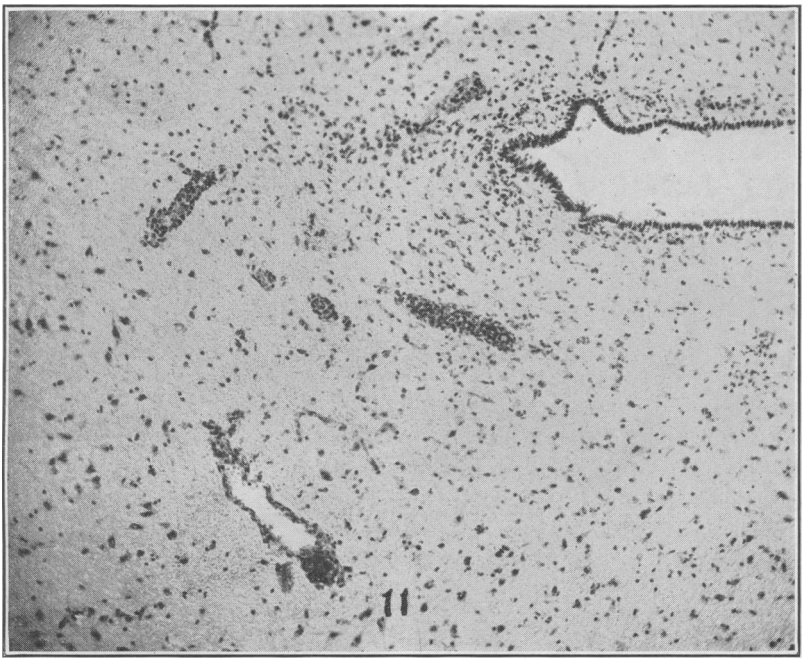
Rabbit 62, two days after intracerebral inoculation with the original culture planted with the patient's midbrain



Rabbit 46 (see Table 2)



Rabbit 196. Cerebral cortex, showing meningeal infiltration, reaction of neuroglia in the superficial layers of the cortex, and perivascular round-cell infiltration



Monkey 39. Mesencephalon. About the aqueduct there are several blood vessels the sheaths of which are packed by lymphocytes and a few leucocytes. There is pronounced reaction on the part of the neuroglia

virulence. Whether or not this decrease in virulence was due to a diminution of viable organisms was not determined.

Cultures in meat medium kept at about 4° C. have maintained their virulence for five months.

EXPERIMENTAL ENCEPHALITIS IN RABBITS

The streptococcus is highly virulent for rabbits when inoculated into the brain. Strain P–95 has been passed through a series of 18 rabbits. The first rabbit of the series was inoculated intracerebrally with nasal washings from the patient, and death occurred in 66 hours. All subsequent inoculations have been with cultures, and death has invariably occurred in less than 18 hours when the inoculations were intracerebral with undiluted fresh culture. The most rapidly fatal result was noted in the thirteenth passage, when death occurred in 5¾ hours.

Strain P–104 has been passed through a series of six rabbits. The first rabbit, inoculated intracerebrally with a culture planted with the human heart blood, died 43 hours after inoculation. In subsequent passages death has occurred in less than 23 hours when the inoculation was intracerebral with undiluted culture.

Strain P–107 has been passed through a series of 12 animals, all rabbits, except that the eighth passage was through a monkey. The first rabbit, inoculated with a culture planted with the human mesencephalon, died in less than 18 hours after inoculation. In all subsequent passages death occurred in less than 18 hours when inoculations were intracerebral with undiluted culture.

The rapidity of death in these rabbits suggests the possibility that a soluble toxin may be responsible for the quick action. That this is not the case was demonstrated on two occasions by inoculating rabbits with cultures that had passed through Mandler filters, as controls for rabbits inoculated at the same time with the same cultures unfiltered. The rabbits inoculated with filtered cultures showed no symptoms. On the other hand, the innumerable colonies which always appear on the series of agar slopes planted with the brains of rabbits which have died a few hours after inoculation leave no doubt that death is caused by the organisms. The rabbit which died in 5¾ hours was already going into a lethargic state by the time it had recovered from the effects of the ether. The lethargy increased until there was complete prostration, with continuous clonic movements of the limbs.

Usually, however, the disease manifests itself in a manner different from that described above. After the intracerebral inoculation of 0.25 cubic centimeter of culture the rabbit recovers from the effects of the ether in 15 or 20 minutes, and then he generally behaves like a normal rabbit for a few hours. The first evidence of the infection

is an increasingly rapid and labored respiration, with a rise in temperature. Then commonly there is a sudden loss of the use of the hind limbs. The rabbit appears alert and tense with excitement and anxiety; he starts now and then with a hurried movement, but does not progress rapidly on account of his dragging hind quarters, which are spastic rather than flaccid. Complete prostration follows, usually accompanied by convulsions, and death occurs a few hours later.

At necropsy the brain is found congested. Frequently the blood vessels in the subcutaneous tissue of the chest and abdomen are congested, and occasionally there is a hemorrhagic exudate. There are no other gross lesions. The urinary bladder is usually found distended.

When inoculations were made with a culture attenuated by glycerin, or with a diluted fresh culture, or when partial protection was secured by a series of intravenous inoculations, or, in some cases, in the first passage rabbit inoculated with culture planted with human material, the course of the disease was prolonged. In no case, however, has death occurred later than the tenth day. Those rabbits which survived that period made a complete and rapid recovery in their general physical condition, with slow recovery from nervous symptoms. The early symptoms most commonly observed when the disease was prolonged were labored breathing, with a purulent discharge from the nose, fever, tremors, incoordination and stiffness of the limbs. Later, a variety of symptoms were manifest, some of which resembled those that characterize epidemic encephalitis in man. Some rabbits held their heads rotated on the long axis toward the side of inoculation and following their heads in rotation they rolled over and over, kicking themselves along until they rolled against an obstruction or until progress was stopped by exhaustion. Figure 7 shows a rabbit with a rotated head, and Figure 8 shows a rabbit in a distorted position commonly observed. Some of the rabbits had strongly retracted necks. (See fig. 9.) Many turned round and round away from the side of inoculation, more rarely toward it. One rabbit, inoculated with the first generation of a culture planted with a piece of the human midbrain, was very sick and developed a strongly rotated head and great loss of weight. On recovery, many weeks after the inoculation, it showed reduced rotation of the head, but a tendency to remain in a certain position almost without moving for a considerable period. There was also observed in this animal an intermittent rhythmic tremor of the jaws, practically a counterpart of the tremor of the jaws frequently observed in patients. This rabbit slowly returned to almost normal, and was used again to determine whether the infection protected it against a subsequent inoculation. (See rabbit 61 in the discussion further on.)

Regardless of whether the inoculation was intracerebral or intravenous, if death occurred within three or four days the brain was always found to be very heavily seeded with the streptococcus, but the heart blood and lungs showed no growth or were sparsely seeded. Sometimes no growth developed in cultures planted with liver, but the liver was found to be sparsely or moderately seeded with the streptococcus more often than in the case of the heart blood or lungs, and occasionally the liver was found to be heavily seeded.

THE APPROXIMATE MINIMAL LETHAL DOSE

A series of experiments was carried out to determine the approximate minimal lethal dose by the intracerebral route. When the culture was diluted 1 to 1,000 or 1 to 10,000, death was delayed from a few hours to nine days. Three rabbits were inoculated with broth culture diluted 1 to 100,000, one with the third and two with the eighth passage culture. They showed no symptoms, although by planting 0.25 cubic centimeter of the diluted cultures it was shown that there were at least a few organisms in the inoculum. The fact that rabbits will withstand light inoculations of the organism without showing symptoms throws some light upon the results obtained in filtration experiments.

FILTRATION EXPERIMENTS

Filtrates of the emulsion of the human brain, of the emulsion of rabbit's brains, and filtrates of cultures have given uniformly negative results when inoculated intracerebrally into rabbits. By planting filtrates in meat medium, however, virulent cultures have been obtained, and they have shown that the organism is in a filterable form in the human brain, in the rabbit brain, and in cultures.

INTRAVENOUS, INTRAPERITONEAL, AND SUBCUTANEOUS INOCULATIONS

Although the virulence of the streptococcus is constant when inoculation is made into the brain, rabbits may withstand intravenous, subcutaneous, or intraperitoneal inoculations of 2 cubic centimeters of culture (approximately 80,000 minimal lethal doses) without showing symptoms. Occasionally, however, infection has followed intravenous inoculation. The protocols for experiments in which infection followed intravenous inoculation of strain P–95 are summarized in Table 1.

When death occurred in less than 48 hours after intravenous inoculation the liver was sometimes heavily seeded, whereas the heart blood and lungs were free from, or sparsely seeded with, the streptococcus. In the case of the two rabbits which died on the third day after intravenous inoculation the infecting agent had disappeared from the liver as well as from the heart blood and lungs.

On the other hand, the brain was heavily seeded with the infecting agent in every rabbit which died after intravenous inoculation. When symptoms were observed they were the same kind of nervous symptoms as follow intracerebral inoculation of the organism. In the majority of cases, however, death occurred suddenly without the observation of symptoms.

PROTECTION EXPERIMENTS

By subjecting rabbits to a course of three or four treatments of intraperitoneal or intravenous inoculations with living culture they become immunized so that they may withstand heavy intracerebral inoculation. The protocols for three such experiments are summarized in Table 2. In rabbit 46 the test dose was approximately 10,000 minimal lethal doses, and death was delayed until the sixth day. In rabbit 50 the test dose was 1,000 minimal lethal doses. The rabbit survived, after two or three days of very severe illness. By the eighth day it was again in good physical condition, but the nervous symptoms continued until death occurred, death being due apparently to some cause not related to the experiment. In rabbit 158 the test dose was 100 minimal lethal doses. Slight nervous symptoms were observed on the second day; they were less pronounced on the third day, and by the tenth day recovery was complete. A control rabbit which received the same intracerebral inoculation as rabbit 158 died in 21 hours.

Two more protection experiments are summarized in Table 3. In these experiments the immunizing treatment was with strain P–95 and the test dose was with strain P–104. The protection afforded by the treatment demonstrates the identity of the strain obtained from the nasal washings of the patient with the strain obtained from the heart blood at necropsy.

Although rabbits could be immunized with repeated intravenous inoculations, intracerebral inoculation of a sublethal dose gave no protection. On the other hand, it appeared to increase the susceptibility of the rabbit to subsequent inoculations. The failure of a sublethal intracerebral inoculation to protect was observed in several rabbits which had not shown nervous symptoms following the intracerebral inoculation. Increased susceptibility was apparent in some of these rabbits, but not in all of them. Lack of protection was demonstrated in two rabbits which suffered severe illness with marked nervous symptoms after intracerebral inoculation. The protocols for these rabbits are summarized in Table 4. Rabbits 61 and 67 were inoculated with different cultures, both of which were original cultures planted with the human midbrain. Rabbit 67 showed marked tremors and incoordination on the second day. Three days later it appeared better except for a rotation of the head. Three weeks after

inoculation the rabbit was in good physical condition, and the rotation of the head was reduced. Four weeks after inoculation the rabbit appeared healthy and normal in every way. Three weeks later it was inoculated intracerebrally with culture P–95. Death followed in five hours—more rapidly than it has ever occurred in rabbits which have not previously received a cerebral inoculation. A control rabbit inoculated at the same time died in seven hours.

Rabbit 61 showed nervous symptoms the day after inoculation. For several days there were marked tremors and incoordination, with a temperature of 41.8° C. Two weeks later an improvement in the general physical condition began, but there was increased rotation of the head until the left eye was turned upward, and there were other mild nervous symptoms. Finally, the nervous condition improved slowly. Then, when in good physical condition, with only a slight rotation of the head, six months after the first inoculation the rabbit was again inoculated intracerebrally with strain P–107, diluted 1 to 100. Death followed in 22 hours, whereas the control rabbit lived 43 hours.

In monkey 36 (see the protocol further on) there is possibly another instance of lack of protection by a previous cerebral infection. The symptoms after the first inoculation were so slight, however, that they were questionable. If these slight symptoms were caused by the introduction of virus into the brain, they were the only observed evidence of a virus from the brain of the human case No. 3.

Protection experiments should be carried out to determine whether the streptococcus described in this paper will immunize against the encephalitis viruses which other workers are carrying from animal to animal without the cultivation of an organism between the passages. If cross protection can be demonstrated, a step forward will have been gained. If cross protection can not be demonstrated, the question will not necessarily be settled. It can not be assumed that the protein in the streptococcus is identical with the protein in the minute forms which pass through a filter. This suggestion comes from the "organ specificity" found in higher forms of life.

HISTOPATHOLOGY OF EXPERIMENTAL ENCEPHALITIS IN RABBITS

Before detailing our results with rabbits it must be recalled that these animals are rather poor subjects for histologic studies on encephalitis because of their liability to spontaneous lesions of the brain. Seven of our eleven control rabbits, killed for other purposes while in apparent good health, showed foci of glia reaction and sometimes rather marked perivascular round-cell infiltration. This finding has been recorded by other investigators, although it is not universally found. The foci of "spontaneous" inflammation are likely to be localized, though in some cases the inflammation is wide-

spread. Occasionally it is seen in the mesencephalon. We can speak of positive results, therefore, only when the inflammatory manifestations in the brain surpass the maximum "spontaneous" inflammation seen in the control animals. The meninges are a more sensitive guide, for they seem not to be involved to any notable degree in the control rabbits.

Of the 16 rabbits studied histologically after inoculation of the streptococcus, all but 2 showed characteristic reactive phenomena in the meninges. These two had lived for about six weeks after intracerebral inoculation of the organism, both having shown symptoms of nervous disorder. One died of peritonitis and the other succumbed within seven hours to a secondary intracerebral inoculation. All the other animals showed meningeal reaction, even within as short a time as 5¾ hours after intracerebral inoculation or 32 hours after intravenous inoculation. The reaction consisted in thickening of the meninges with edema, and infiltration of their meshes with lymphocytes and polynuclear leucocytes, among which eosinophiles were not infrequent. Often there was great congestion of the smaller vessels, and occasionally there was diapedesis of red blood cells into the interstices of the tissue. In no case was there frank suppuration, nor were any notable amounts of fibrin present. The most marked reaction was observed usually over the dorsum of the mesencephalon where the loose-lying cells were less apt to bedisplaced during technical procedures. There was less inflammation at the base.

Some inflammatory reaction within the parenchyma of the brain was observed in every case studied, but three of these cases had to be excluded from consideration on account of the slight character of the reaction, coming as it did within normal limits. It appeared within 12 hours after intracerebral inoculation, but was not found in animals that lived six weeks after inoculation even though these animals had shown characteristic nervous symptoms. Signs of old inflammation were to be seen in these animals, however, in an increased density of the cerebral cortex due to neuroglia overgrowth.

When well developed, this encephalitis in the rabbit presented unmistakable features. There was penetration along the sheaths of the vessels entering the cerebral substance from the meninges, of large numbers of lymphocytes, sometimes accompanied by polymorphonuclear leucocytes. There was reactive gliosis of marked proportions in the superficial layers of the cortex where many good examples of microglia cells were to be found. There was apparent condensation of the cortex, due to the large increase in the number of glia cells present, somewhat recalling the picture of dementia paralytica in the human brain. Some nerve cells had lost their chromatin material, others were shrunken and hyperchromatic. Many showed swollen outlines.

Satellitosis was frequent. The inflammation extended over the cerebral cortex in a diffuse manner, never localizing into abscesses. The most marked lesions were usually in the cerebral cortex (see fig. 10). In the deeper areas it was not rare to encounter vessels surrounded by thick collars of lymphocytes and polymorphonuclear leucocytes. In some cases the mesencephalon seemed to be particularly seriously invaded. The substantia nigra, which is the part of the human brain bearing the brunt of the attack, did not show any serious alterations, although in some instances there was an inflammatory reaction in the neighborhood. The cerebellum and medulla oblongata on the whole showed less marked inflammatory reaction, although there was considerable swelling and chromatolysis of the nerve cells.

The other organs investigated—heart, lung, liver, and kidney—showed no characteristic lesions after either intravenous or intracerebral inoculation. Congestion and albuminous degeneration were manifest, but no foci of inflammation. No instance of bronchopneumonia was encountered. Sometimes there appeared to be some increase in the number of round cells in the perilobular tissues in the liver, but this was also seen in control animals, even in the absence of coccidiosis. The muscles were not investigated histologically, but grossly they showed no specific alterations.

On the whole the reaction of the tissues in the central nervous system resembled the reaction in acute encephalitis in man to a pronounced degree. The election of the cortex in preference to the mesencephalon and the presence of numbers of leucocytes were the only outstanding differences.

EXPERIMENTAL ENCEPHALITIS IN MONKEYS

The pathogenicity of the streptococcus was tested on four monkeys. The complete records of the disease in these monkeys are presented below.

MONKEY 36

7–21–25: Inoculated intracerebrally with about 1 cubic centimeter of emulsion of the mid-brain of Case 3. Three days later he was observed to be sluggish and pale. Slight spasmodic movements resembling hiccoughs were observed. The next day he had recovered, and no further symptoms were observed.

9–28–25: Inoculated intraperitoneally with 2 cubic centimeters of culture P–95 (8)[2]. No symptoms followed.

10–14–25, 1. 30 p. m.: Inoculated intracerebrally with 0.5 cubic centimeter of culture P–95 (9). At 4 p. m. the monkey appeared normal.

10–15–25, 9 a. m.: The monkey was found dead. At autopsy a purulent discharge at the nose was observed. Heart blood, liver, lung, and brain were planted.

[2] The figure in parenthesis following the description of the inoculum designates the number of rabbits the strain had passed through previous to the inoculation of the monkey.

10–16–25: Cultures show that heart blood and lung were sparsely seeded, and liver and brain were heavily seeded with P–95.

Grossly the internal organs and the brain showed no lesions. Microscopically the heart showed swelling and granularity of the cytoplasm of the muscle fibers, with loss of cross striation. There were no infiltrations. The spleen and kidney appeared normal. Except for congestion the lungs were normal.

Over the cerebral cortex the meninges were congested and somewhat infiltrated by lymphocytes and endothelial cells, with here and there a small number of polymorphonuclear leucoytes. There was some free blood in the meninges, but this might have occurred consequent to removal of the brain. Along the sheaths of the vessels penetrating into the cerebral substance from the pia mater there were found a small number of lymphocytes, and some of the deeper vessels were also involved in the same manner. There appeared to be some mobilization of neuroglia cells, amoeboid forms being present in the upper layers of the cortex. The nerve cells of the cortex showed considerable swelling and loss of chromatin bodies but rupture of the cells or definite disease of the nuclei was not observed. The nerve cells of the basal ganglia and thalamus were swollen and showed chromatolysis. In these parts there were no inflammatory manifestations, but the hypothalamus showed marked perivascular round-cell infiltration and congestion of the vessels. Acute cellular degenerative changes were prominent, although there was but slight neuroglia reaction. The cerebellum and medulla oblongata showed only mild chromatolysis and satellitosis of the ganglion cells.

MONKEY 31

In April, 1925, this monkey had been inoculated in the carotid artery with 1 cubic centimeter of a coccus culture obtained in a study of poliomyelitis. No symptoms followed.

10–21–25: Inoculated intracerebrally with 0.5 cubic centimeter culture P–95 (10) diluted 1 to 200. No symptoms followed.

11–13–25: Inoculated intraperitoneally with 2 cubic centimeters culture P–95 (14).

11–14–25: Inoculated intraperitoneally with 2 cubic centimeters culture P–95 (14).

11–17–25: Inoculated intraperitoneally with 2 cubic centimeters culture P–95 (14).

11–18–25: Inoculated intraperitoneally with 2 cubic centimeters culture P–95 (14).

11–19–25: Inoculated intraperitoneally with 2 cubic centimeters culture P–95 (15).

11–20–25: Inoculated intraperitoneally with 2 cubic centimeters culture P–95 (15).

11–21–25: Inoculated intraperitoneally with 2 cubic centimeters culture P–95 (15).

11–23–25: Inoculated intracerebrally with 0.25 cubic centimeter culture P–95 (15).

No symptoms followed any of these inoculations.

An injection of culture equal to the final dose proved fatal to an untreated monkey. (See monkey 38, below.) Therefore the conclusion seems warranted that monkey 31 had been immunized by the previous treatment.

MONKEY 38

11–23–25, 3.35 p. m.: Inoculated intracerebrally with 0.25 cubic centimeter culture P–95 (15).

11–24–25, 9.15 a. m.: "The monkey shows some pallor, with cyanosis of the scalp. He is sluggish, must be roused to activity, and then shows tremors.

No difference is noted in the face. The left arm is held in flexion and partial pronation, the fingers inclosing the thumb. The limb seems hypertonic rather than flaccid and is scarcely used at all. When moved it shows moderate tremors. The left leg is weak. During the examination the animal fell over on its left side and lay there."

Noon: "The monkey is sitting up but shows marked tremors when attempting to move."

3.30 p. m.: "Sitting up in corner of cage, the head drooping forward on the chest, apparently dozing. Rouses quickly on stimulation, but soon relapses."

4 p. m.: "Convulsions."

5.15 p. m.: "Found lying down. When light is turned on he rouses quickly, but almost immediately closes his eyes and pays little attention to what is going on. He is easily aroused by noises or by light flashed on him. The same weakness and lack of movement of the left arm and leg are noticed, but there is nothing significant in the face. The pupils are equal and react to light. There is no nystagmus. When sitting up he lets his head fall forward, assumes a hunched position, and goes to sleep."

11–25–25, 9 a. m.: "Very weak. He can sit up when aroused, but soon falls over, always on the left side. Tremors are less marked. Temperature, 36.8°."

3.30 p. m.: "Lying motionless, with eyes closed. The monkey is easily roused, looks brightly at the examiners, but does not try to move, and almost immediately closes his eyes again. The breathing is normal in rate and depth."

11–26–25, 12.45 p. m.: "Animal lies motionless, with eyes closed. When his right hand is touched with the stick he clutches it with a good grip, but without opening his eyes. He is roused with greater difficulty. Once with the aid of the stick he pulled himself up to a sitting position, using his right hand alone, but he fell over almost immediately."

No further convulsions were noted. The animal died during the night.

Heart blood, liver, lung, and brain were planted.

11–28–25: No growth from heart blood. Lung sparsely seeded, liver heavily seeded, and brain very heavily seeded with P–95.

At the necropsy the blood vessels of the subcutaneous tissue and omentum were found congested, the lungs showed hypostatic congestion without pneumonia, the heart muscle was rather soft, but the liver and kidney showed no appreciable gross changes. The leptomeninges were markedly congested, but there was no purulent exudate visible. The brain was somewhat soft. Section through the cerebrum revealed many small red points of congested vessels in various parts. In the basal ganglia, however, there were large areas of irregular reddish-stained tissue with yellowish surroundings. The brain substance was soft in this area but not diffluent. The reaction was more marked on the right side, but quite pronounced upon the left. Sections through the cerebellum and medulla disclosed no similar areas of hemorrhagic encephalitis.

Microscopically the heart showed severe toxic changes and several foci of lymphocytic infiltration, an acute interstitial nonsuppurative myocarditis. The lungs, in addition to some old foci of fibrosis, showed only congestion, without polynuclear infiltration. The spleen showed large germinal follicles and congestion, the kidney rather marked degeneration of the tubular epithelium but no abscess formation. The meninges of the cerebrum showed marked infiltration by leucocytes, distention of the veins, and moderate escape of erythrocytes into the meshes of the tissue. The cerebral substance was edematous. The cerebral cortex showed rather severe toxic changes, swelling of ganglion cells and fragmentation of chromatin granules, and some glia mobilization. There was also infiltration of the sheaths of the vessels by adventitious cells, polymorphonuclear leucocytes predominating. In the

putamen there were many areas of focal hemorrhage, with necrosis of all cerebral tissue, complete degeneration of the nervous elements, abundance of amœboid and phagocytic neuroglia cells, many of which were also degenerated, and infiltration by large numbers of leucocytes. In addition there were areas of leucocytic infiltration, which appeared to be going on to abscess formation. The endothelium of vessels was swollen and their vascular sheaths were packed with leucocytes and round cells. Microorganisms were visible singly and in groups, sometimes in curved chains. Some large coccoid bodies were found staining pale blue with azure. The glia cells showed abundant granules in their cytoplasm, some of which were recognizable as cocci, others of which were disintegrating. Coccoid bodies were found within glia cells in a few instances. No definite similarity to Negri bodies was to be observed, however, and the ganglion cells did not contain foreign bodies.

The inflammation was most marked in the putamen, next in the cerebral cortex and tectum mesencephali, less in the thalamus, hypothalamus, locus niger, and scarcely at all in the cerebellum and medulla oblongata. The choroid plexus was also the seat of leucocytic infiltration, and the ventricular cavities contained numerous leucocytes.

This picture differed considerably from that found in human encephalitis in that leucocytes were numerous and hemorrhages had occurred in the basal ganglia. It was more like the polioencephalitis hemorrhagica described by Wernicke. The explanation may lie in the greater virulence of the organism or in the peculiarity of the reaction of the tissues of the monkey, but is probably found in the early stage at which death occurred. There was no abscess at the site of the inoculation, and the lesions were about equally severe on both sides.

MONKEY 39

12–1–25, 3.45 p. m.: Inoculated intracerebrally with 0.25 cubic centimeter culture P–107 (7).

12–2–25, 9 a. m.: "Monkey has been rather hard hit. He shows marked tremors in voluntary movements. Every minute or two he yawns, stretching his mouth to the fullest extent. This is apparently an involuntary, forced action. The eyes are somewhat protruded and staring, move fully and concertedly without nystagmus, but rove about rather wildly. The hind quarters appear somewhat disabled, although the animal was not taken from the cage for demonstration of this point."

11.30 a. m.: "The animal is found crouched in the cage, his face touching the floor. When roused, he sits up, looks alertly around him, and yawns; and when left alone he sinks forward on the floor again and dozes. Temperature 38.4.°"

12–3–25, 9 a. m.: "He is found wide awake, eating, leaning up against the side of the cage for support. The right hind limb is crumpled under him in a helpless manner. There are moderate tremors and incoordinated movements."

12–3–25, 3.55 p. m.: "Animal lies motionless in a crouched position, his head resting on the water cup. He blinks his eyes frequently at the observer but makes no attempt to get up. No ocular paralyses are observed."

Same day, 4.15 p. m.: "Dead. Placed in ice box."

12–4–25: At autopsy the brain was found congested, but no other lesions were observed. Heart blood, liver, lung, and brain were planted.

12–5–25: No growth from heart blood or liver; lung sparsely seeded, brain heavily seeded with P–107.

The gross and microscopic lesions in the case of this monkey resembled so closely those found in monkey 38 that no further description is considered necessary. There was, perhaps, slightly less reaction on the part of the neuroglia and the

suppurative process had gone forward to a somewhat less extent. The nature of the inflammation in the two cases was exactly similar. The inflammatory reaction about the aqueduct of Sylvius is shown in fig. 11, pl. IV.

SUMMARY

A pleomorphic streptococcus, highly virulent for rabbits when inoculated intracerebrally, was obtained from the nasal washings, heart blood, and mesencephalon of a case of epidemic encephalitis.

In so far as the comparative tests have been made, this streptococcus agreed with the streptococci obtained from cases of epidemic encephalitis by Von Wiesner and by Rosenow. Apparently several other investigators have cultivated the same organism in their studies of the disease.

When inoculated intravenously into rabbits the streptococcus shows a tendency to elective localization in the brain.

In rabbits and in monkeys it produces nervous symptoms which in some cases simulate the disease in man.

Rabbits inoculated with this streptococcus show no inflammatory lesions outside of the central nervous system. The meninges are heavily infiltrated with lymphocytes and leucocytes, the inflammation spreads to the cerebral substance by direct extension and along the small vessels, penetrating into the brain. There are severe parenchymatous degenerative changes in the nervous tissue and reaction of the neuroglia. The sheaths of the blood vessels are found infiltrated by lymphocytes. The reaction is sometimes most marked in the mesencephalon.

In monkeys there is noted a greater tendency toward leucocytic reaction, and in two instances large areas of hemorrhagic inflammation in the basal ganglia were noted.

Acknowledgments: The writers are indebted to Maj. G. R. Callendar Medical Corps, United States Army, Curator, Army Medical Museum for making photomicrographs 2–5, and to Miss Marguerite F. Wilcox, Bureau of Plant Industry, United States Department of Agriculture, for photomicrograph 6.

REFERENCES

Bradford, John Rose, Bashford, E. F., and Wilson, J. A. (1918): Acute infective polyneuritis. Quarterly J. of Med., Oxford, **12**, 88–126. 9 pl.

Brasher, C. W. J., Caldwell, J. R., and Coombe, E. J. (1919): A report on two cases of encephalitis lethargica. Brit. Med. J., **1**, 733–734.

Cohn, Walter, and Lauber, Ilse (1920): Zur Frage der Encephalitis epidemica. Münch. med. Wchnschr., **67**, 688–690.

Crofton, W. M. (1925): Encephalitis lethargica. Med. J. and Rec., **122**, 331–335.

Doerr, R., and Schnabel, A. (1921): Weitere experimentelle Beiträge zur Aetiologie und Verbreitungsart des Herpes febrilis beim Menchen. Schweiz. med. Wchnschr., Basel, 469, 562–564.

Levaditi, C., and Harvier, P. (1920): Le virus de l'Encéphalite lethargique (Encéphalite épidémique.) C. R. Soc. de Biol., Paris, **83**, 354–356.

Loewe, Leo, and Strauss, Israel (1920): Studies in epidemic (lethargic) encephalitis. Cultural studies. J. Inf. Dis., Chicago, 27, 250–269.

Maggiora, Mantovani, and Tombolato (1920): Ricerche su l'eziologia dell' encefalite letargica. Riforma Medica, Naples, 36, p. 114.

M'Intosh, James (1920): Transmission of experimental encephalitis lethargica in series in monkeys and rabbits, with notes on a spontaneous infection in a monkey. Brit. J. Exper. Path., Lond., 1, 257–262.

Ottolenghi, D., d'Antona, S., and Tonietti, F. (1920): Sull' eziologia dell' encefalite letargica. Policlinico, Rome, 27, 1075–1080.

Perdrau, J. R. (1925): The virus of encephalitis lethargica. Brit. J. Exper. Path., Lond., 6, 123–128.

Reichert, Fr. (1920): Beitrag zur Aetiologie der Encephalitis lethargica. Centrabll. f. Bakteriol. etc., Abt. 1, Orig., Jena, 85, 261–267.

Rosenow, E. C. (1924): Streptococci in relation to etiology of epidemic encephalitis. Experimental results in eighty-one cases. J. Inf. Dis., Chicago, 34, 329–389.

Stafford, C. M. (1919): Encephalitis lethargica. J. Lab. and Clin. Med., St. Louis, 4, 691–694.

Thalheimer, William (1921): Epidemic (lethargic) encephalitis. Preliminary communication. Arch. Neurology and Psychiatry, 5, 113–120.

Von Wiesner, Richard R. (1917): Die Aetiologie der Encephalitis lethargica. Wien. klin. Wchnschr., 30, 933–935.

TABLE 1.—*Results of intraperitoneal and intravenous inoculation of rabbits with strain P–95*

Rabbit No.	Passage No.	Date of inoculation	Condition of culture	Mode of inoculation	Amount of inoculum	Result	Bacteriologic findings
					C. c.		
51	3	Aug. 14, 1925	24-hour culture; third culture generation from heart blood of rabbit 38.	Intravenous	2.0	Dead, 42 hours	Brain and liver heavily seeded with P–95.
49	3	do	do	Intraperitoneal	2.0	No symptoms	
	4	Aug. 18, 1925	3-day culture, second culture generation from liver of rabbit 48.	Intravenous	2.0	do	
	5	Aug. 21, 1925	24-hour culture planted with brain of rabbit 71.	do	2.0	Head retracted; stiffness of limbs; finally loss of use of hind legs. Chloroformed when dying, 69 hours after last inoculation.	No growth from heart blood or liver; lung sparsely seeded with an extraneous coccus (not virulent when inoculated intracerebrally into rabbits); brain heavily seeded with P–95.
156	4	Oct. 10, 1925	29-day culture planted with brain of rabbit 111.	do	1.0	No symptoms	
	10	Oct. 14, 1925	6-day culture planted with brain of rabbit 146.	do	2.0	Dead, 32 hours	Heart blood and lung sparsely seeded, liver moderately seeded, and brain very heavily seeded with P–95.
196	12	Nov. 5, 1925	7-day culture planted with brain of rabbit 179.	Intraperitoneal	2.0	No symptoms	
	13	Nov. 9, 1925	2-day culture planted with brain of rabbit 195.	Intravenous	2.0	Hind legs paralyzed. Continuous clonic movements of fore legs and lower jaw. Dead, 69 hours.	No growth from heart blood or lung, liver sparsely seeded, brain very heavily seeded with P–95.
261	4	Nov. 28, 1925	24-hour culture planted with brain of rabbit 241.	do	.5	Dead, 46 hours	Heart blood, no growth; liver and lung very sparsely seeded, brain very heavily seeded with P–95.
262	4	do	do	do	.5	Dead, 41 hours	Heart blood and lung no growth; liver and brain heavily seeded with P–95.

TABLE 2.—*Experiments to show protection of rabbits against intracerebral inoculation* [1]

Rabbit No.	Passage No.	Date of inoculation	Condition of culture	Mode of inoculation	Amount of inoculum	Result	Bacteriologic findings
					C. c.		
46	3	Aug. 14, 1925	24-hour culture, third culture generation from heart blood of rabbit 38.	Intravenous	0.5	No symptoms	
	4	Aug. 18, 1925	3-day culture, second culture generation from liver of rabbit 48.	do	2.0	do	
	5	Aug. 21, 1925	24-hour culture planted with brain of rabbit 71.	do	2.0	do	
	6	Aug. 25, 9125	24-hour culture planted with brain of rabbit 49.	Intracerebral	.25	Paralysis of hind legs. Wild circulatory movement of head, which is retracted when at rest. (See fig. 9.) Chloformed when dying, 6 days after last inoculation.	No growth from heart blood, liver, or lung. Brain sparsely seeded with P-95.
50	3	Aug. 14, 1925	24-hour culture, third culture generation from heart blood of rabbit 38.	Intraperitoneal	2.0	No symptoms	
	4	Aug. 18, 1925	3-day culture, second culture generation from liver of rabbit 48.	Intravenous	2.0	No symptoms	
	5	Aug. 21, 1925	24-hour culture planted with brain of rabbit 71.	do	2.0	No symptoms	
	6	Aug. 25, 1925	24-hour culture planted with brain of rabbit 49, diluted 1 to 10.	Intracerebral	.25	Tremors, incoordination, head retracted, temperature 42° C. on second day. Recovered except for increasing distortion of head, until finally right eye was turned toward the left. (See fig. 7.) Could not walk but rolled over and over. Died of peritonitis 41 days after last inoculation.	No streptococci from heart blood, liver, lung, or brain. Brain was sparsely seeded with a staplylococcus.
158	8	Oct. 10, 1925	14-day culture planted with brain of rabbit 134.	Intravenous	2.0	No symptoms	
	9	Oct. 14, 1925	6-day culture planted with brain of rabbit 149.	do	2.0	do	
	9	Oct. 15, 1925	7-day culture planted with brain of rabbit 149.	do	2.0	do	
	10	Oct. 16, 1925	1-day culture planted with brain of rabbit 160.	do	2.0	do	
	10	Oct. 26, 1925	5-day culture planted with brain of rabbit 160, diluted 1 to 100.	Intracerebral	.25	On second day weakness, tremors, stiffness of limbs. Complete recovery by the tenth day.	

[1] Controls: As controls for rabbit 46, 10 rabbits were inoculated with undiluted culture of P-95, the passage numbers varying from the third to the seventeenth. In every case death resulted in less than 18 hours.

As controls for rabbits 50 and 158, 1 rabbit (third passage) inoculated with a 1 to 10 dilution of P-95 died in less than 18 hours; 4 rabbits (passages varying from the fourth to the fifteenth) inoculated with 1 to 100 dilutions died between the eighteenth and thirtieth hours; 2 rabbits (fifth and eighteenth passages) inoculated with 1 to 1,000 dilutions died in 41 and 22 hours, respectively.

A control rabbit inoculated at the same time as rabbit 158, with the same inoculum, died in 21 hours.

TABLE 3.—*Identification of strains P–95 and P–104 by cross protection. Immunizing treatment was with strain P–95, given intravenously or intraperitoneally; the test dose was with strain P–104, given intracerebrally*

Treated rabbits					Untreated rabbits (controls)	
Rabbit No.	No. of immunizing doses	Test inoculation: Date	Test inoculation: Condition of culture	Test inoculation: Result	Rabbit No.	Result
155	4	Oct. 27, 1925 (4 days after last intravenous inoculation).	19-day culture diluted 1 to 10.	Slight symptoms on the day following inoculation. Recovered on the second day.	178	Marked nervous symptoms, slow recovery. Hind legs slightly stiff a month after inoculation.
197	4	Nov. 24, 1925 (6 days after last intravenous inoculation).	30-day culture.....	Slight nervous symptoms. Complete recovery in 3 weeks.	239	Dead, 16 hours.

TABLE 4.—*Rabbits which survive a brain infection are not protected against subsequent inoculation*

Rabbit No.	Preliminary inoculation [1]: Date	Preliminary inoculation [1]: Inoculum	Preliminary inoculation [1]: Result	Fatal inoculation: Date	Fatal inoculation: Inoculum	Fatal inoculation: Result	Number of hours to death of control rabbit
67	Aug. 18, 1925	3-day culture planted with human mesencephalon.	Nervous symptoms with complete recovery. (See text, pp. 1106, 1107.)	Oct. 7, 1925	12-day culture of P–95 (ninth passage).	Dead, 5 hours.....	7
61	Aug. 17, 1925	2-day culture planted with human mesencephalon.	Severe illness with marked nervous symptoms, and final recovery. (See text, pp. 1106, 1107.)	Feb. 16, 1926	13-day culture of P–107 diluted 1 to 100 (twelfth passage).	Dead, 22 hours.....	43

[1] All inoculations were intracerebral, with 0.25 cubic centimeter of culture.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Greater Travel Causes Demand for More Comfort Stations. Anon. *The Nation's Health*, Vol. 8, No. 2, February 15, 1926, pp. 110–112. (Abstracted by C. G. Gillespie.)

Michigan, Minnesota, and Wisconsin laws require cities and villages to erect and maintain public comfort stations. In Minnesota there are 385 tourist resorts, all provided with public comfort stations. Gas filling stations maintain 1,800 additional such stations. In Wisconsin 469 municipalities have comfort stations ranging from 1 or 2 per 5,000 people to 10 to 30 for cities with populations of 400,000. One toilet bowl for each 1,000 females served, one toilet seat and one urinal for each 1,000 males, and one lavatory for each set of toilet fixtures are provided. Many communities are meeting the problem in a satisfactory manner by building suitable, creditable buildings.

Safeguarding the City's Milk Supply. H. C. Becker, Director of Tuberculosis Eradication, Chicago Department of Health. Chicago Municipal Tuberculosis Sanitarium *Bulletin*, Vol. 6, No. 1, January, 1926, pp. 1–5. (Abstracted by Isador W. Mendelsohn.)

Chicago's milk supply is obtained from about 300,000 cows on 25,000 farms, located in northern Illinois, southern Wisconsin, northwestern Indiana, and southwestern Michigan. About 1,250,000 quarts of milk are consumed daily in the city. The sanitary production of this milk on the farms is supervised by Chicago health department inspectors, traveling in automobiles. Unless corrections are made where insanitary conditions exist, the milk is barred from entry into the city. The cooperation of the local health authorities and physicians is secured where possible in reporting and properly handling communicable diseases occurring among the 100,000 persons living on the farms supplying milk to Chicago.

The milk is transported over 25 steam and electric railroads and by auto trucks to creameries in the country or in Chicago, where the milk is pasteurized and bottled. Milk samples are collected by the health department inspectors, and chemical, bacterial, temperature, and sedimentation tests are made.

The 511 milk dealers in the city use about 4,000 wagons and auto trucks in delivering milk to the consumers. All persons selling milk in the city must be licensed by the health department.

Studies on Pasteurization. William T. Johnson, jr., Assoc Bacteriologist, Dairy Bureau, United States Department of Agriculture, Grove City, Pa. *Second Annual Report*, 1926, Pennsylvania Association of Dairy and Milk Inspectors, pp. 122–126. (Abstracted by H. A. Whittaker.)

The writer gives some recent laboratory experiments on a number of representative *Bacillus coli* organisms in order to determine their ability to withstand pasteurizing temperatures. It is concluded from these experiments that a pasteurizing temperature of 145° F., held for 30 minutes, was a critical temperature for the colon organism, and that some strains do actually survive pasteurizing temperatures.

The author also brings out the difference between "majority" and "absolute" thermal death points of organisms as applied to pasteurization. Reference is made to certain experiments conducted on *Bacillus aerogenes* to show what a wide discrepancy exists between these two temperatures. The following statement is made relative to this subject:

> Since all nonspore-bearing bacterial cells are similar to *B. aerogenes* in this respect, it is quite important that the selection of an effective pasteurization temperature must be based on the "absolute" thermal death point of pathogenic organisms, determined under laboratory conditions and in milk. Large scale efficiency tests are not necessary, and are likely to be misleading and wrongly interpreted, so as to give a false sense of safety. Knowing the "absolute" thermal death point of pathogenic organisms, the most valuable work for the future, in connection with pasteurization, will be a study of the temperatures obtained in commercial practice, and the development of suitable instruments for determining that all of the milk in a given pasteurizing process is heated to a point which will provide a safe margin above the "absolute" death point of pathogenic organisms.

Algæ. W. C. Purdy, Plankton Expert, United States Public Health Service. *Water Works*, Vol.63, No. 1, January 14, 1925, p. 115. (Abstracted by W. C. Purdy.)

Visible mats and masses of the larger algæ are common in streams and sometimes in water reservoirs. The microscopic forms, however, are the most likely to give trouble by producing tastes or odors, or by clogging filters.

Copper sulfate is not always successful in combating algal growth. Chlorine has been used with good results where $CuSO_4$ has failed.

Sir A. C. Houston suggests a coagulant, to be followed by lime, the latter to remove any CO_2 present, as this gas is a food material for algæ. Another worker tried $CuSO_4$, also excess lime, with poor results. Then sulfuric acid was used in sufficient amount to neutralize all bicarbonates present, thereby removing this source (bicarbonates) of CO_2 for algal food. Good results followed this plan.

Algæ may be an actual asset to the water on account of the excess oxygen they produce by photosynthesis, this oxygen being available for aerobic bacterial decomposition of organic matter. The extensive plant-filled shallow portions of the Potomac River were found to produce sufficient oxygen in this way to be a very material help in the oxidation of Washington sewage.

This production of excess oxygen is shared by the microscopic algæ also, or the phytoplankton. The plankton of some streams

consists chiefly of these minute plants, rather than of animals. Nearly a thousand weekly samples taken from the Illinois River at various points over a period of 14 months show a plant content of 65 to 95 per cent of the total plankton. Thus, even a minute portion of water may possess a microscopic but efficient "Home Guard" which, cooperating with its allies of aerobic bacteria, will successfully compete with invasions of organic matter.

Prevention of Stream Pollution Profitable. Anon. *Domestic Engineering*, Vol. 114, No. 11, March 13, 1926, p. 66. (Abstracted by Arthur P. Miller.)

This short article points out that, in Michigan, the prevention of stream pollution is a profitable procedure. The elimination of the polluting matter is being accomplished not only at a gain in public health and a saving to aquatic life, but at an eventual profit to those concerns that have been causing the pollution. Several examples are pointed out, as, for instance, the tanneries, which have taken steps to recover hair and fertilizer that has been going into the rivers for years. The hair is recovered and sold for $75 a bale, while the fertilizer is in great demand. A paper mill has been dumping its waste water, pulp, and acid into a southern Michigan river, and it is said has spent $50,000 for waste treatment research but already this company is recovering from experimental work alone an average of $5,000 per year.

Zeolite Serves Twenty Months Without Changing. F. B. Beech. *Water Works Engineering*, Vol. 79, No. 3, February 1, 1926, pp. 147–148. (Abstracted by A. H. Wieters.)

The writer describes a zeolite water-softening plant installed by the Ohio Valley Water Co. A small plant was installed in 1922 for the purpose of softening the boiler feed water and for experimental purposes. This plant paid for itself in 10 months, and after 404 days of continuous operation the zeolite was removed and showed no appreciable alteration except a slight increase in manganese content.

The article describes in detail the zeolite used. This is the "green sand," or glauconite, found chiefly in New Jersey. The theory of zeolite softening is also described in detail.

It was found that a rate of 6 gallons per square foot per minute produces water of 0 hardness where the water contains not more than 16 grains of hardness. Harder waters required lower rates. Changes in the method of salt application resulted in the lowering of the amount of salt used for ½ to ⅓ pound of salt per 1,000 grains of hardness removed.

No cost data were given except the statement that the cost was practically the same as for the lime-soda process. A typical analysis of the water is given showing, among other things, a reduction of the hardness from 151.4 to 0 in p. p. m.

The advantages of this process over the lime-soda process are noted as follows: Removal of manganese and grenothrix; more complete softening; requires far less space; more flexible and certain; and does not require a highly-trained operator.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Right of regents of University of California to require that students be vaccinated upheld.—California First District Court of Appeal; Wallace *v.* Regents of University of California et al., 242 P. 892; decided November 20, 1925.) A rule imposed by the regents of the University of California required that every person in attendance as a student at said institution should provide satisfactory evidence to the authorities in charge that he or she had been successfully vaccinated against smallpox within seven years prior to application for admission. Petitioner in this case was refused admission as a student because of failure to comply with the vaccination requirement. He applied for a peremptory writ of mandate to compel the university authorities to admit him, claiming that the regents had no authority to exact such a requirement and that the regulation was invalid and contrary to existing general law. Chapter 370, Laws of 1921, provided that "The control of smallpox shall be under the direction of the State board of health, and no rule or regulation on the subject of vaccination shall be adopted by school or local health authorities." It had previously been held that the board of regents, under section 9 of article 9 of the State constitution, had, at the time the rule in question was promulgated, power to adopt and enforce regulations concerning health measures and to require vaccination as a prerequisite to the admission of a student to the university, as at that time there was an absence of legislation lawfully limiting the exercise of that power. The court decided in favor of the university and denied the writ of mandate, the reasons therefor being shown by the following quotation from the opinion:

> There is no question but that the legislature may under its police power limit or abrogate this right [of the regents to adopt health regulations and to require vaccination], and in fact respondents do not claim otherwise, for they concede that the power vested under the constitution in the regents is not so broad as to destroy or limit the general power of the legislature to enact laws for the general welfare of the public, including laws regulating the subject of vaccination, even though it might incidentally affect the University of California, as such a law would be paramount as against a rule of the regents in conflict therewith. They do claim, however, that no such law exists, as neither the legislature nor the board of health under its grant of power has attempted to pass any law or rule which in any manner contravenes the regents' regulation in reference to the matter since the passage of the act of 1921.

The present law [chapter 370, Laws of 1921] does not itself attempt to regulate the subject, but it merely delegates to the board in question certain powers. Whatever rights this body may have under this grant of power is a matter with which we are not here concerned, for it has made no attempt to exercise any power whatsoever. The legislative declaration that no rule or regulation shall be adopted by school or local health authorities is not a regulation, nor, in fact, is it a health law, but rather, under the circumstances, it is one in effect which forbids or prevents the adoption of a health measure, at least until such time as a rule or regulation on the subject has been adopted in conformity with the provisions of the act.

In so far as the act may be considered as a prohibition or limitation upon the constitutional power of the university to pass health laws, it is clearly void. The legislature can not, by this character of a general law, take away or impair the power so granted. In order to accomplish this result it must itself regulate the subject by appropriate legislation. A general law which does not itself regulate, but which merely provides, as here, that there shall be no local regulation, can have no proper application to local bodies deriving their powers under a constitutional grant, as such law amounts to no more than a legislative attempt to nullify such constitutional grant, and it is to that extent invalid.

County not liable for expense of sanitary work not authorized by county board of health.—(Montana Supreme Court; Pue *v.* Lewis and Clark County, 243 P. 573; decided January 23, 1926.) The plaintiff brought an action against Lewis and Clark County to recover for the value of certain sanitary work performed by him in cleaning vaults, etc. This work was done at the direction of the county health officer, who, however, had not received authorization for the doing of the same from the county board of health. It was also shown that the county health officer had assumed to appoint a deputy county health officer who took part in the inspection of premises to be cleaned. The lower court granted a nonsuit on the motion of the defendant, on the ground that no authority had been disclosed, either in the county health officer or so-called deputy county health officer, to incur the indebtedness upon which the complaint was based. The supreme court affirmed the judgment of the lower court, holding that, under the statutes, authority to perform such work was required to be given by the county board of health. The court stated that since the county health officer "did not seek and was not granted authority from the county board of health to enter into the contract or incur the expense made the basis of plaintiff's cause of action, he had no authority to make the contract or incur such expense, and consequently the plaintiff wholly failed to prove the contract set out in his complaint." The court also stated that no authority had been discovered in the statutes for the appointment of a deputy health officer.

Evidence held not sufficient to show that water furnished was cause of typhoid fever.—(Washington Supreme Court; Webber et ux. *v.* Pacific Power & Light Co., 242 P. 1104; decided February 10, 1926.) The

plaintiffs, husband and wife, sought to recover damages from the defendant company on the ground that the wife's illness with typhoid fever was due to the use of infected water furnished by the defendant. A jury returned a verdict for the plaintiffs and judgment was entered thereon. On appeal the supreme court held that the evidence was insufficient to show that the wife's illness was caused by the water furnished by the defendant.

Tuberculosis held compensable under workmen's compensation act.—(Texas Court of Civil Appeals; Aetna Life Ins. Co. *v.* Graham et al., 279 S. W. 923; decided December 24, 1925.) One of the points decided in this case was that tuberculosis, developing from an irritated condition of the nose, throat, and lungs caused by the inhalation of fumes incident to the mixture of chemicals in making shoe polish, was a compensable injury under the Texas workmen's compensation law.

Town held liable for damages caused by sewage pollution of stream.—(North Carolina Supreme Court; Cook et al. *v.* Town of Mebane, 131 S. E. 407; decided January 27, 1926.) One of the grounds of complaint in this case was that the town of Mebane by the discharge of sewage had polluted the stream which flowed through the land of plaintiffs to the damage of their land and mill site. The jury found for the plaintiffs and the judgment of the lower court thereon was affirmed by the supreme court.

Damages allowed for illness resulting from sight of dead cockroaches in pie being eaten.—(New York Supreme Court, Appellate Division; Carroll *v.* New York Pie Baking Co., 213 N. Y. S. 553; decided January 22, 1926.) The plaintiff, while eating a piece of pie cut from a pie made by the defendant, discovered that several crushed cockroaches were imbedded in the bottom crust of the pie. The sight of them made her ill and action was brought to recover damages on account of the illness. A judgment for plaintiff, entered on the verdict of a jury, was affirmed by the court.

City meat inspection ordinance held valid.—(Maryland Court of Appeals; Mayor and City Council of Baltimore et al. *v.* Bloecher and Schaff (Inc.), et al., 132 A. 160; decided January 14, 1926.) Ordinance No. 431, adopted on June 25, 1925, by the city of Baltimore and regulating the slaughtering, etc., of animals for human food, was attacked on the ground that it infringed constitutional provisions, but the court held the ordinance to be a valid and constitutional exercise of legislative power by the mayor and city council of Baltimore.

Examinations for Entrance into the Regular Corps of the Public Health Service

Examinations of candidates for entrance into the Regular Corps of the United States Public Health Service will be held at the following-named places on the date specified:

Washington, D. C., July 12, 1926.
Chicago, Ill., July 12, 1926.
New Orleans, La., July 12, 1926.
San Francisco, Calif., July 12, 1926.

Candidates must be not less than 23 nor more than 32 years of age, and they must have been graduated in medicine at some reputable medical college, and have had one year's hospital experience or two years' professional practice. They must pass satisfactorily oral, written, and clinical tests before a board of medical officers and must undergo a physical examination.

Successful candidates will be recommended for appointment by the President, with the advice and consent of the Senate.

Requests for information or permission to take this examination should be addressed to the Surgeon General, United States Public Health Service, Washington, D. C.

DEATHS DURING WEEK ENDED MAY 22, 1926

Summary of information received by telegraph from industrial insurance companies for week ended May 22, 1926, and corresponding week of 1925. (From the Weekly Health Index, May 26, 1926, issued by the Bureau of the Census, Department of Commerce)

	Week ended May 22, 1926	Corresponding week 1925
Policies in force	63, 426, 726	59, 943, 647
Number of death claims	12, 655	11, 906
Death claims per 1,000 policies in force, annual rate	10. 4	10. 4

Deaths from all causes in certain large cities of the United States during the week ended May 22, 1926, infant mortality, annual death rate, and comparison with corresponding week of 1925. (From the Weekly Health Index, May 26, 1926, issued by the Bureau of the Census, Department of Commerce)

City	Week ended May 22, 1926		Annual death rate per 1,000 corresponding week 1925	Deaths under 1 year		Infant mortality rate, week ended May 22, 1926 [2]
	Total deaths	Death rate [1]		Week ended May 22, 1926	Corresponding week, 1925	
Total (64 cities)	7, 329	13. 3	12. 9	858	860	[3] 71
Akron	36			5	6	53
Albany [4]	35	15. 3	16. 8	1	5	21
Atlanta	81			6	13	
White	27			2		
Colored	54	(5)		4		
Baltimore [4]	259	16. 7	15. 1	33	19	96
White	191			19		68
Colored	68	(5)		14		227

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 62 cities.
[4] Deaths for week ended Friday, May 21, 1926.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta 31, Baltimore 15, Birmingham 39, Dallas 15, Forth Worth 14, Houston 25, Kansas City, Kans., 14, Louisville 17, Memphis 38, Nashville 30, New Orleans 26, Norfolk 38, Richmond 32, and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended May 22, 1926, infant mortality, annual death rate, and comparison with corresponding week of 1925. (From the Weekly Health Index, May 26, 1926, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended May 22, 1926		Annual death rate per 1,000 corresponding week 1925	Deaths under 1 year		Infant mortality rate, week ended May 22, 1926
	Total deaths	Death rate		Week ended May 22, 1926	Corresponding week, 1925	
Birmingham	72	17.8	19.0	4	9	
White	26			1		
Colored	46	(5)		3		
Boston	245	16.2	15.5	24	40	68
Bridgeport	33			5	2	85
Buffalo	159	15.2	12.6	26	20	103
Cambridge	36	15.4	10.0	5	1	33
Camden	38	15.1	10.9	2	3	24
Chicago [4]	659	11.3	11.5	62	81	55
Cincinnati	140	17.8	15.8	14	13	87
Cleveland	194	10.5	10.2	30	24	78
Columbus	66	12.1	12.5	8	7	73
Dallas	45	11.7	11.9	7	6	
White	32			5		
Colored	13	(5)		2		
Denver	59	10.8	14.5	1	9	
Des Moines	26	9.3	14.0	1	4	17
Detroit	349	14.1	11.2	60	55	97
Duluth	20	9.2	8.0	3	0	70
El Paso	36	17.2	20.9	8	11	
Erie	32			3	2	57
Fall River [4]	26	10.3	10.5	4	3	58
Flint	35	13.3	8.0	7	3	116
Fort Worth	28	9.2	14.0	2	5	
White	20			2		
Colored	8	(5)		0		
Grand Rapids	31	10.4	14.9	6	9	97
Houston	54			8	9	
White	31			5		
Colored	23	(5)		3		
Indianapolis	105	14.9	11.6	9	7	66
White	88			8		68
Colored	17			1		55
Jacksonville, Fla	38	20.5	15.3	6	4	125
White	17			3		98
Colored	21			3		172
Jersey City	66	10.8	11.6	10	11	71
Kansas City, Kans	23	10.3	11.7	2	1	35
White	17			1		21
Colored	6	(5)		1		131
Kansas City, Mo	97	13.5	13.3	14	7	
Los Angeles	216			19	32	53
Louisville	85	14.3	14.5	10	7	86
White	61			8		80
Colored	24	(5)		2		125
Lowell	26			2	6	37
Lynn	26	13.0	9.6	1	4	25
Memphis	64	18.9	20.9	4	13	
White	39			2		
Colored	25	(5)		2		
Milwaukee	120	12.1	15.1	16	21	74
Minneapolis	93	11.2	11.8	14	9	78
Nashville [4]	56	21.3	18.4	6	7	
White	32			4		
Colored	24	(5)		2		
New Bedford	26			7	1	122
New Haven	27	7.7	12.2	4	3	55
New Orleans	119	14.8	20.8	9	29	
White	76			4		
Colored	43	(5)		5		
New York	1,546	13.6	12.6	171	176	69
Bronx Borough	175	10.1	9.3	16	16	53
Brooklyn Borough	528	12.3	11.7	56	63	57
Manhattan Borough	649	18.0	16.4	80	82	88
Queens Borough	142	9.7	8.3	17	13	77
Richmond Borough	52	19.0	15.1	2	2	35

[4] Deaths for week ended Friday, May 21, 1926.

[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta 31, Baltimore 15, Birmingham 39, Dallas 15, Fort Worth 14, Houston 25, Kansas City, Kans., 14, Louisville 17, Memphis 38, Nashville 30, New Orleans 26, Norfolk 38, Richmond 32, and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended May 22, 1926, infant mortality, annual death rate, and comparison with corresponding week of 1925. (From the Weekly Health Index, May 26, 1926, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended May 22, 1926		Annual death rate per 1,000 corresponding week 1925	Deaths under 1 year		Infant mortality rate, week ended May 22, 1926
	Total deaths	Death rate		Week ended May 22, 1926	Corresponding week, 1925	
Newark, N. J	112	12.7	10.8	25	9	120
Norfolk	32	9.6	10.2	4	6	74
White	18			2		59
Colored	14	(1)		2		99
Oakland	47	9.4	8.4	4	4	46
Oklahoma City	23			0	4	
Omaha	54	13.1	10.3	3	5	31
Paterson	34	12.4	17.7	3	7	52
Philadelphia	518	13.5	13.6	61	57	81
Pittsburgh	165	13.5	14.8	20	23	66
Portland, Oreg	58			1	6	10
Providence	73	13.8	11.5	8	9	66
Richmond	47	13.0	14.3	4	5	50
White	28			3		59
Colored	19	(1)		1		35
Rochester	110	17.9	14.3	13	12	104
St. Louis	210	13.2	13.8	27	12	
St. Paul	52	10.9	17.2	3	5	27
Salt Lake City	36	14.1	11.9	2	2	28
San Antonio	62	15.8	12.1	16	10	
San Diego	39	18.5	13.3	2	5	42
San Francisco	124	11.4	12.6	7	18	42
Schenectady	24	13.5	9.0	1	1	29
Seattle	69			3	10	28
Somerville	23	12.0	16.3	3	2	78
Spokane	17	8.1	15.8	1	2	23
Springfield, Mass	35	12.6	12.1	6	4	87
Syracuse	49	13.9	16.3	8	5	101
Toledo	75	13.3	10.3	10	7	97
Trenton	40	15.6	13.0	5	1	84
Utica	33	16.7	16.4	6	2	132
Washington, D. C	152	15.0	11.1	10	9	57
White	87			4		33
Colored	65	(1)		6		109
Waterbury	19			5	5	107
Wilmington, Del	30	12.6	11.5	3	5	70
Worcester	59	15.9	9.6	12	2	138
Yonkers	25	11.2	10.6	4	4	90
Youngstown	29	9.2	7.2	3	1	38

[1] In the cities for which deaths are shown by color, the colored population for 1920 constituted the following percentages of the total population: Atlanta 31, Baltimore 15, Birmingham 39, Dallas 15, Forth Worth 14, Houston 25, Kansas City, Kans., 14, Louisville 17, Memphis 38, Nashville 30, New Orleans 26, Norfolk 38, Richmond 22, and Washington, D. C., 25.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Reports for Week Ended May 29, 1926

ALABAMA

	Cases
Chicken pox	23
Diphtheria	10
Influenza	15
Malaria	19
Measles	271
Mumps	24
Pellagra	20
Pneumonia	36
Scarlet fever	5
Smallpox	40
Tuberculosis	64
Typhoid fever	16
Typhus fever	2
Whooping cough	53

ARIZONA

Chicken pox	8
Diphtheria	1
Influenza	151
Measles	80
Pneumonia	11
Scarlet fever	4
Smallpox	1
Trachoma	316
Tuberculosis	42
Typhoid fever	12

ARKANSAS

Chicken pox	15
Hookworm disease	2
Influenza	5
Malaria	10
Measles	40
Mumps	4
Pellagra	6
Scarlet fever	4
Trachoma	6
Tuberculosis	4
Whooping cough	15

CALIFORNIA

Cerebrospinal meningitis:	Cases
Fresno County	1
San Diego	1
San Francisco	1
Siskiyou County	1
Chicken pox	190
Diphtheria	93
Influenza	20
Measles	430
Mumps	207
Poliomyelitis:	
Los Angeles	3
Los Angeles County	2
Riverside County	1
Southgate	1
Rocky Mountain spotted fever—Lassen County	1
Scarlet fever	130
Smallpox	14
Typhoid fever	13
Whooping cough	51

COLORADO

Diphtheria	17
German measles	15
Impetigo contagiosa	1
Measles	42
Mumps	2
Pneumonia	2
Scarlet fever	26
Smallpox	1
Tuberculosis	75
Typhoid fever	1
Vincent's angina	1
Whooping cough	54

CONNECTICUT

Cerebrospinal meningitis	1
Chicken pox	48
Conjunctivitis (infectious)	3

CONNECTICUT—continued	Cases
Diphtheria	14
German measles	64
Influenza	7
Lethargic encephalitis	1
Measles	544
Mumps	12
Pneumonia (broncho)	41
Pneumonia (lobar)	33
Scarlet fever	84
Tuberculosis (all forms)	51
Whooping cough	39
DELAWARE	
Chicken pox	1
Diphtheria	4
Malaria	1
Measles	50
Pneumonia	2
Scarlet fever	6
Tuberculosis	1
Whooping cough	2
DISTRICT OF COLUMBIA	
Chicken pox	21
Diphtheria	20
Measles	248
Pneumonia	31
Scarlet fever	20
Tuberculosis	20
Whooping cough	34
FLORIDA	
Chicken pox	29
Diphtheria	13
Malaria	1
Measles	114
Mumps	29
Pneumonia	3
Scarlet fever	11
Smallpox	62
Tuberculosis	4
Typhoid fever	17
Whooping cough	28
GEORGIA	
Chicken pox	26
Diphtheria	11
Dysentery	35
Hookworm disease	24
Influenza	20
Lethargic encephalitis	1
Malaria	38
Measles	137
Mumps	30
Paratyphoid fever	2
Pellagra	4
Pneumonia	36
Scarlet fever	4
Septic sore throat	9
Smallpox	27
Tuberculosis	25
Typhoid fever	14
Whooping cough	25
IDAHO	
Cerebrospinal meningitis—Pocatello	1
Chicken pox	5
Measles	10

IDAHO—continued	Cases
Mumps	3
Scarlet fever	5
Smallpox	10
Whooping cough	1
ILLINOIS	
Cerebrospinal meningitis:	
Cook County	1
St. Clair County	1
Diphtheria	72
Influenza	68
Lethargic encephalitis:	
Cook county	1
McDonough County	1
Measles	1,290
Pneumonia	355
Scarlet fever	336
Smallpox	21
Tuberculosis	399
Typhoid fever	8
Whooping cough	206
INDIANA	
Chicken pox	49
Diphtheria	12
Influenza	9
Measles	573
Pneumonia	14
Scarlet fever	98
Smallpox	35
Trachoma	7
Tuberculosis	55
Typhoid fever	3
Whooping cough	65
KANSAS	
Chicken pox	65
Diphtheria	11
Dysentery	1
German measles	17
Influenza	4
Measles	458
Mumps	29
Pneumonia	21
Scarlet fever	36
Smallpox	23
Tuberculosis	62
Typhoid fever	3
Whooping cough	159
LOUISIANA	
Diphtheria	8
Influenza	20
Leprosy	1
Malaria	9
Pellagra	16
Pneumonia	42
Scarlet fever	11
Smallpox	16
Tuberculosis	44
Typhoid fever	12
Whooping cough	15
MAINE	
Chicken pox	14
Diphtheria	1
German measles	57

MAINE—continued

	Cases
Influenza	8
Measles	268
Mumps	53
Paratyphoid fever	2
Pneumonia	12
Scarlet fever	29
Tetanus	1
Tuberculosis	16
Typhoid fever	4
Vincent's angina	2
Whooping cough	65

MARYLAND [1]

Cerebrospinal meningitis	1
Chicken pox	119
Diphtheria	19
Dysentery	1
German measles	8
Influenza	6
Malaria	1
Measles	279
Mumps	194
Pneumonia (broncho)	29
Pneumonia (lobar)	29
Scarlet fever	47
Septic sore throat	4
Tetanus	1
Tuberculosis	67
Typhoid fever	10
Whooping cough	63

MASSACHUSETTS

Chicken pox	137
Conjunctivitis (suppurative)	12
Diphtheria	41
German measles	377
Influenza	6
Lethargic encephalitis	2
Measles	690
Mumps	161
Ophthalmia neonatorum	25
Pneumonia (lobar)	79
Scarlet fever	234
Septic sore throat	5
Tetanus	1
Trachoma	2
Tuberculosis (pulmonary)	133
Tuberculosis (other forms)	33
Typhoid fever	8
Whooping cough	248

MICHIGAN

Diphtheria	84
Measles	1,407
Pneumonia	134
Scarlet fever	329
Smallpox	13
Tuberculosis	392
Typhoid fever	5
Whooping cough	146

[1] Week ended Friday.

MINNESOTA

	Cases
Cerebrospinal meningitis	1
Chicken pox	105
Diphtheria	37
Influenza	4
Lethargic encephalitis	1
Measles	600
Pneumonia	5
Poliomyelitis	2
Scarlet fever	229
Smallpox	10
Tuberculosis	86
Typhoid fever	3
Whooping cough	36

MISSISSIPPI

Diphtheria	6
Scarlet fever	1
Smallpox	3
Typhoid fever	2

MISSOURI

(Exclusive of Kansas City)

Cerebrospinal meningitis	1
Chicken pox	38
Diphtheria	63
Influenza	1
Measles	873
Mumps	10
Ophthalmia neonatorum	1
Scarlet fever	121
Septic sore throat	3
Smallpox	14
Tetanus	1
Trachoma	7
Tuberculosis	37
Typhoid fever	7
Whooping cough	58

MONTANA

Cerebrospinal meningitis	1
Chicken pox	18
Diphtheria	2
German measles	20
Measles	132
Mumps	2
Rocky Mountain spotted fever:	
East Helena	1
Worden	1
Scarlet fever	18
Smallpox	2
Tuberculosis	2
Typhoid fever	1
Whooping cough	5

NEBRASKA

Chicken pox	43
Measles	95
Mumps	5
Scarlet fever	71
Smallpox	20
Tuberculosis	5
Whooping cough	1

NEW JERSEY

	Cases
Anthrax	1
Cerebrospinal meningitis	1
Chicken pox	178
Diphtheria	87
Influenza	6
Measles	1,437
Pneumonia	124
Poliomyelitis	2
Scarlet fever	180
Trachoma	1
Typhoid fever	8
Whooping cough	82

NEW MEXICO

Chicken pox	23
Conjunctivitis	1
Diphtheria	3
German measles	1
Malaria	2
Measles	10
Mumps	12
Pneumonia	7
Rabies (in animals)	2
Scarlet fever	6
Tetanus	1
Tuberculosis	21
Whooping cough	36

NEW YORK
(Exclusive of New York City)

Cerebrospinal meningitis	1
Chicken pox	194
Diphtheria	63
German measles	499
Influenza	43
Lethargic encephalitis	2
Malaria	3
Measles	2,472
Mumps	195
Ophthalmia neonatorum	3
Paratyphoid fever	1
Pneumonia	277
Scarlet fever	198
Septic sore throat	4
Smallpox	5
Tetanus	1
Trachoma	1
Typhoid fever	15
Vincent's angina	9
Whooping cough	308

NORTH CAROLINA

Chicken pox	82
Diphtheria	14
German measles	176
Measles	334
Ophthalmia neonatorum	1
Scarlet fever	20
Septic sore throat	2
Smallpox	33
Typhoid fever	6
Whooping cough	316

OKLAHOMA
(Exclusive of Oklahoma City and Tulsa)

Cerebrospinal meningitis—Kiowa County	1
Chicken pox	27
Diphtheria	7
Influenza	55
Malaria	38
Measles	106
Mumps	3
Pellagra	16
Pneumonia	23
Scarlet fever	26
Smallpox	15
Typhoid fever	13
Whooping cough	43

OREGON

Cerebrospinal meningitis	4
Chicken pox	57
Diphtheria	13
Influenza	19
Measles	117
Mumps	34
Pneumonia	[2] 8
Scarlet fever	46
Septic sore throat	2
Smallpox:	
Portland	10
Scattering	10
Tuberculosis	5
Typhoid fever	5
Whooping cough	37

PENNSYLVANIA

Cerebrospinal meningitis—Pittsburgh	1
Diphtheria	96
Lethargic encephalitis	1
Malaria	1
Measles	3,171
Scarlet fever	481
Smallpox	3
Trachoma—Pittsburgh	3
Typhoid fever	10

RHODE ISLAND

Chicken pox	6
Diphtheria	3
German measles	22
Measles	73
Mumps	1
Pneumonia	1
Scarlet fever	4
Tuberculosis	4
Whooping cough	13

SOUTH DAKOTA

Chicken pox	1
Influenza	1
Measles	32
Mumps	15
Pneumonia	3
Poliomyelitis	1
Scarlet fever	52
Smallpox	1
Trachoma	1
Tuberculosis	3
Whooping cough	14

[2] Deaths.

TENNESSEE	Cases
Cerebrospinal meningitis—Nashville	3
Chicken pox	25
Diphtheria	6
Influenza	24
Lethargic encephalitis—Cannon County	1
Malaria	5
Measles	397
Mumps	5
Ophthalmia neonatorum	2
Pellagra	29
Pneumonia	22
Scarlet fever	21
Smallpox	18
Tetanus	2
Trachoma	2
Tuberculosis	44
Typhoid fever	15
Whooping cough	16

TEXAS	
Chicken pox	63
Diphtheria	18
Influenza	11
Measles	8
Mumps	50
Pellagra	3
Pneumonia	5
Scarlet fever	30
Smallpox	58
Tuberculosis	31
Typhoid fever	6
Typhus fever	1
Whooping cough	71

UTAH	
Chicken pox	42
Diphtheria	13
German measles	8
Measles	65
Mumps	25
Pneumonia	3
Scarlet fever	5
Smallpox	2
Tuberculosis	1
Whooping cough	201

VERMONT	
Chicken pox	13
Measles	54
Mumps	9
Poliomyelitis	1
Scarlet fever	2
Whooping cough	13

VIRGINIA	
Poliomyelitis—Chesterfield County	1
Smallpox	5

WASHINGTON	
Cerebrospinal meningitis:	
Aberdeen	6
Seattle	1
Spokane	1

WASHINGTON—continued	Cases
Diphtheria	25
German measles	89
Measles	77
Mumps	22
Scarlet fever	48
Smallpox	43
Tuberculosis	10

WEST VIRGINIA	
Chicken pox	15
Diphtheria	5
Influenza	12
Measles	699
Scarlet fever	36
Smallpox	1
Tuberculosis	34
Typhoid fever	15
Whooping cough	17

WISCONSIN	
Milwaukee:	
Chicken pox	66
Diphtheria	12
German measles	2
Influenza	3
Measles	312
Mumps	32
Pneumonia	40
Scarlet fever	20
Tuberculosis	23
Whooping cough	67
Scattering:	
Chicken pox	63
Diphtheria	17
German measles	101
Influenza	29
Measles	1,207
Mumps	81
Pneumonia	24
Scarlet fever	90
Smallpox	3
Tuberculosis	43
Typhoid fever	4
Whooping cough	87

WYOMING	
Anthrax—Sheridan County	1
Chicken pox	1
Diphtheria	1
German measles	1
Influenza	1
Measles	9
Pneumonia	1
Rocky Mountain spotted fever:	
Converse County	1
Johnson County	1
Sheridan County	1
Whooping cough	5

Report for Week Ended May 22, 1926

NORTH DAKOTA	Cases	NORTH DAKOTA—continued	Cases
Chicken pox	17	Rocky Mountain spotted fever	1
Diphtheria	6	Scarlet fever	43
German measles	36	Smallpox	2
Lethargic encephalitis	1	Trachoma	2
Measles	42	Tuberculosis	5
Mumps	14	Typhoid fever	1
Pneumonia	4	Whooping cough	5

Report for Week Ended May 15, 1926

NORTH DAKOTA	Cases	NORTH DAKOTA—continued	Cases
Chicken pox	10	Pneumonia	12
Diphtheria	12	Poliomyelitis	1
German measles	128	Scarlet fever	79
Lethargic encephalitis	1	Tuberculosis	3
Measles	34	Whooping cough	3
Mumps	28		

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Cerebrospinal meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January, 1926										
Pennsylvania	5	899	-------	0	10,357	0	3	2,486	2	108
February, 1926										
Pennsylvania	6	788	-------	1	12,469	0	4	2,396	7	119
April, 1926										
Alabama	4	30	1,682	35	904	48	2	63	175	34
Arkansas	0	5	945	168	143	41	0	27	30	12
Illinois	10	326	628	0	4,299	0	3	1,507	164	44
Kansas	7	66	69	0	2,704	0	0	269	50	9
Maine	1	11	1,678	0	1,342	0	0	86	0	18
Maryland	5	89	229	3	2,609	0	1	207	0	30
Michigan	-------	303	106	0	6,532	-------	2	1,401	28	18
Minnesota	4	272	12	-------	2,389	-------	0	1,434	20	14
Mississippi	3	66	6,360	3,200	1,942	652	2	37	106	59
New York	35	959	4,018	4	15,052	-------	9	1,792	14	71
North Carolina	1	81	-------	-------	1,166	-------	0	106	152	13
Ohio	3	370	1,251	1	11,250	0	2	1,419	253	21
Oklahoma [1]	4	50	2,717	64	264	19	0	156	128	28
Rhode Island	0	18	45	-------	802	0	0	35	0	3
South Carolina	0	107	7,517	391	139	297	20	31	106	32
Washington	25	58	52	-------	284	-------	-------	322	283	25
West Virginia	0	55	1,312	-------	1,956	0	0	204	73	18

[1] Exclusive of Oklahoma City and Tulsa.

PLAGUE-ERADICATIVE MEASURES IN LOS ANGELES, CALIF.

The following items were taken from the reports of plague-eradicative measures from Los Angeles, Calif.:

Week ended May 22, 1926:

Number of rats trapped	511
Number of rats found to be plague infected	0
Number of squirrels examined	668
Number of squirrels found to be plague infected	0
Number of mice trapped	412
Number of mice found to be plague infected	0

Date of discovery of last plague-infected rodent, Nov. 6, 1925.
Date of last human case, Jan. 15, 1925.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

Diphtheria.—For the week ended May 15, 1926, 36 States reported 973 cases of diphtheria. For the week ended May 16, 1925, the same States reported 1,263 cases of this disease. Ninety-nine cities, situated in all parts of the country and having an aggregate population of nearly 30,000,000, reported 701 cases of diphtheria for the week ended May 15, 1926. Last year for the corresponding week they reported 897 cases. The estimated expentancy for these cities was 894 cases. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Measles.—Thirty-three States reported 17,929 cases of measles for the week ended May 15, 1926, and 5,172 cases of this disease for the week ended May 16, 1925. Ninety-nine cities reported 8,936 cases of measles for the week this year, and 3,423 cases last year.

Poliomyelitis.—The health officers of 37 States reported 6 cases of poliomyelitis for the week ended May 15, 1926. The same States reported 18 cases for the week ended May 16, 1925.

Scarlet fever.—Scarlet fever was reported for the week as follows: Thirty-six States—this year, 3,402 cases; last year, 3,402 cases; 99 cities—this year, 1,877 cases; last year, 1,866 cases; estimated expectancy, 1,084 cases.

Smallpox.—For the week ended May 15, 1926, 37 States reported 667 cases of smallpox. Last year for the corresponding week they reported 808 cases. Ninety-nine cities reported smallpox for the week as follows: 1926, 147 cases; 1925, 251 cases; estimated expectancy, 117 cases. Three deaths from smallpox were reported by these cities for the week this year—1 at Omaha, Nebr., and 2 at Los Angeles, Calif.

Typhoid fever.—Two hundred and seven cases of typhoid fever were reported for the week ended May 15, 1926, by 35 States. For the corresponding week of 1925, the same States reported 270 cases of this disease. Ninety-nine cities reported 44 cases of typhoid fever for the week this year and 74 cases for the corresponding week last year. The estimated expectancy for these cities was 58 cases.

Influenza and pneumonia.—Deaths from influenza and pneumonia were reported for the week by 94 cities with a population of nearly 29,300,000, as follows: 1926, 935 deaths; 1925, 755.

City reports for week ended May 15, 1926

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrences 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 1917 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	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	75,333	1	1	1	0	0	152	3	2
New Hampshire:									
Concord	22,546	0	0	0	0	0	0	0	2
Manchester	83,097	0	1	0	0	0	10	0	3
Vermont:									
Barre	10,008	0	0	0	0	0	0	1	0
Burlington	24,089	1	0	0	0	0	2	0	0
Massachusetts:									
Boston	779,620	22	52	15	6	1	158	42	29
Fall River	128,993	0	3	2	0	0	18	0	5
Springfield	142,065	11	3	0	0	0	22	0	2
Worcester	190,757	0	4	2	0	0	6	0	9
Rhode Island:									
Pawtucket	69,760	0	0	2	0	0	7	0	3
Providence	267,918	0	10	8	0	0	57	0	5
Connecticut:									
Bridgeport	(1)	0	5	3	0	1	4	0	5
Hartford	160,197	1	6	4	3	0	12	0	8
New Haven	178,927	17	3	0	0	0	71	1	0
MIDDLE ATLANTIC									
New York:									
Buffalo	538,016	27	10	6	0	0	23	0	33
New York	5,873,356	119	260	138	55	14	1,034	82	188
Rochester	316,786	10	7	12	3	1	86	0	12
Syracuse	182,003	3	6	0	0	0	225	19	2
New Jersey:									
Camden	128,642	6	4	5	1	1	38	0	1
Newark	452,513	54	15	18	2	0	227	14	11
Trenton	132,020	2	3	2	0	0	48	1	4
Pennsylvania:									
Philadelphia	1,979,364	75	66	75	----	13	515	6	56
Pittsburgh	631,563	21	17	14	----	6	169	2	24
Reading	112,707	12	3	1	----	0	42	0	1
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	409,333	7	7	5	0	3	283	15	18
Cleveland	936,485	26	19	25	2	2	70	1	23
Columbus	279,836	4	3	13	0	0	155	0	8
Toledo	287,380	45	5	0	0	0	361	0	9
Indiana:									
Fort Wayne	97,846	6	2	1	0	0	53	0	2
Indianapolis	358,819	10	5	3	0	1	103	0	19
South Bend	80,091	3	0	1	0	0	40	0	10
Terre Haute	71,071	2	1	0	0	0	23	0	2
Illinois:									
Chicago	2,995,239	147	92	35	11	9	205	22	63
Peoria	81,564	4	0	0	0	0	0	5	3
Springfield	63,923	6	0	1	2	1	31	1	1
Michigan:									
Detroit	1,245,824	33	41	47	2	5	132	10	35
Flint	130,316	11	4	1	0	0	147	0	8
Grand Rapids	153,698	3	3	0	0	1	49	0	3

[1] No estimate made.

City reports for week ended May 15, 1926—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Wisconsin:									
Kenosha	50,891	11	1	0	0	0	3	0	0
Madison	46,385	5	0	2	0	0	236	0	2
Milwaukee	509,192	86	10	5	2	3	289	45	19
Racine	67,707	1	1	2	1	1	159	8	1
Superior	39,671	0	1	0	0	0	38	0	2
WEST NORTH CENTRAL									
Minnesota:									
Duluth	110,502	9	1	0	0	0	47	0	1
Minneapolis	425,435	55	16	27	0	0	185	0	7
St. Paul	246,001	29	16	9	0	2	295	3	6
Iowa:									
Davenport	52,469	4	1	0	0	-------	15	0	-------
Des Moines	141,441	0	3	0	0	-------	1	0	-------
Sioux City	76,411	4	1	0	0	-------	0	1	-------
Waterloo	36,771	5	0	0	0	-------	59	0	-------
Missouri:									
Kansas City	367,481	-------	6	-------	-------	-------	-------	-------	-------
St. Joseph	78,342	2	1	0	0	0	9	0	4
St. Louis	821,543	24	41	60	0	1	1,147	9	-------
North Dakota:									
Fargo	26,403	0	0	0	0	0	0	16	0
Grand Forks	14,811	-------	0	-------	-------	-------	-------	-------	-------
South Dakota:									
Aberdeen	15,036	3	0	0	0	-------	21	12	-------
Sioux Falls	30,127	0	0	0	0	0	4	0	0
Nebraska:									
Lincoln	60,941	9	2	1	0	1	1	1	1
Omaha	211,768	21	3	0	0	0	129	1	11
Kansas:									
Topeka	55,411	33	1	2	0	0	7	0	0
Wichita	88,367	0	1	0	0	0	34	0	3
SOUTH ATLANTIC									
Delaware:									
Wilmington	122,049	2	1	0	0	0	5	0	2
Maryland:									
Baltimore	796,296	61	21	11	3	3	80	172	42
Cumberland	33,741	0	1	0	1	1	21	0	0
Frederick	12,035	0	0	0	0	0	7	0	0
District of Columbia:									
Washington	497,906	22	10	15	1	1	427	0	21
Virginia:									
Lynchburg	30,395	12	1	2	0	0	73	1	0
Norfolk	(1)	36	1	0	1	0	12	1	4
Richmond	186,403	6	2	0	0	0	92	3	4
Roanoke	58,208	2	1	0	0	0	70	0	1
West Virginia:									
Charleston	49,019	1	1	0	4	2	19	0	0
Huntington	63,485	0	0	0	0	1	0	0	0
Wheeling	56,208	6	1	2	0	0	177	0	1
North Carolina:									
Raleigh	30,371	5	1	1	0	0	0	0	5
Wilmington	37,061	9	0	1	0	0	0	1	1
Winston-Salem	69,031	0	0	0	0	0	9	0	3
South Carolina:									
Charleston	73,125	8	0	0	14	0	13	2	1
Columbia	41,225	5	0	1	0	0	0	0	0
Greenville	27,311	0	0	0	0	0	1	1	0
Georgia:									
Atlanta	(1)	5	1	7	11	1	16	0	9
Brunswick	16,809	3	0	0	0	0	1	0	0
Savannah	93,134	1	0	0	0	0	1	1	0
Florida:									
Miami	69,754	2	-------	6	0	0	9	3	0
St. Petersburg	26,847	-------	0	-------	-------	0	-------	-------	2
Tampa	94,743	3	1	1	0	1	5	1	3

[1] No estimate made.

City reports for week ended May 15, 1926—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,309	0	1	0	0	0	20	0	2
Louisville	305,935	1	4	1	1	0	142	1	15
Tennessee:									
Memphis	174,533	7	2	3	0	1	369	6	5
Nashville	136,220	2	1	1	0	4	15	0	7
Alabama:									
Birmingham	205,670	16	1	5	4	1	100	1	6
Mobile	65,955	2	0	0	0	0	0	0	0
Montgomery	46,481	1	1	0	0	0	21	6	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	31,643	3	1	0	0	----	1	0	----
Little Rock	74,216	0	0	1	0	0	25	0	2
Louisiana:									
New Orleans	414,493	2	6	3	9	4	2	0	13
Shreveport	57,857	0	1	1	0	0	1	10	2
Oklahoma:									
Oklahoma City	(1)	1	1	1	4	0	3	0	2
Texas:									
Dallas	194,450	17	3	8	0	1	1	1	3
Galveston	48,375	0	0	0	0	0	0	0	1
Houston	164,954	0	2	4	0	0	0	0	1
San Antonio	198,069	2	1	2	0	1	6	0	7
MOUNTAIN									
Montana:									
Billings	17,971	1	1	0	0	1	0	0	0
Great Falls	29,883	9	1	0	0	0	67	0	1
Helena	12,037	0	0	0	0	0	0	0	1
Missoula	12,668	3	0	0	0	0	1	4	0
Idaho:									
Boise	23,042	0	0	0	0	0	6	0	0
Colorado:									
Denver	280,911	29	10	10	----	1	45	1	3
Pueblo	43,787	14	1	4	0	0	20	0	2
New Mexico:									
Albuquerque	21,000	1	1	2	0	0	3	4	0
Arizona:									
Phoenix	38,669	0	0	0	0	1	0	0	3
Utah:									
Salt Lake City	130,948	33	3	6	0	0	13	9	3
Nevada:									
Reno	12,665	0	0	0	0	0	1	2	0
PACIFIC									
Washington:									
Seattle	(1)	48	5	1	0	----	56	33	----
Spokane	108,897	8	3	0	0	----	1	0	----
Tacoma	104,455	1	1	1	0	0	6	2	2
Oregon:									
Portland	282,383	13	4	4	0	2	15	4	2
California:									
Los Angeles	(1)	55	34	49	10	1	12	11	19
Sacramento	72,260	3	2	3	0	0	0	4	1
San Francisco	557,530	47	20	11	2	0	177	12	4

[1] No estimate made.

City reports for week ended May 15, 1926—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	2	3	0	0	0	3	1	0	0	6	21
New Hampshire:											
Concord	1	2	0	0	0	2	0	0	0	0	18
Manchester	2	10	0	0	0	0	1	0	0	0	19
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	0	3
Burlington	0	1	0	0	0	1	1	0	0	0	2
Massachusetts:											
Boston	53	66	0	0	0	16	2	0	0	78	244
Fall River	4	1	0	0	0	2	0	0	0	5	30
Springfield	6	8	0	0	0	0	0	0	0	1	45
Worcester	8	5	0	0	0	7	0	0	0	27	53
Rhode Island:											
Pawtucket	1	3	0	0	0	0	0	0	0	0	16
Providence	10	5	0	0	0	2	0	0	0	6	59
Connecticut:											
Bridgeport	6	20	0	0	0	7	0	0	0	1	39
Hartford	4	3	0	0	0	2	0	0	1	0	53
New Haven	5	16	0	0	0	0	0	0	0	15	7
MIDDLE ATLANTIC											
New York:											
Buffalo	18	13	0	0	0	9	1	2	0	33	142
New York	255	209	0	0	0	[1] 95	11	13	1	63	1,441
Rochester	15	15	0	0	0	3	1	1	0	10	85
Syracuse	12	0	0	0	0	0	0	0	0	46	40
New Jersey:											
Camden	4	7	0	0	0	5	0	0	0	4	35
Newark	20	22	0	0	0	6	0	3	0	20	125
Trenton	2	3	0	0	0	8	0	0	0	5	35
Pennsylvania:											
Philadelphia	77	128	0	0	0	28	5	2	1	40	493
Pittsburgh	25	35	0	1	0	15	1	0	0	101	163
Reading	2	8	0	0	0	2	0	0	0	9	38
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	14	11	2	4	0	13	1	1	0	22	150
Cleveland	21	102	2	0	0	18	1	0	0	123	218
Columbus	8	21	2	0	0	4	0	0	0	6	77
Toledo	14	10	4	0	0	11	0	1	0	40	80
Indiana:											
Fort Wayne	2	16	3	1	0	0	0	0	0	3	20
Indianapolis	13	26	8	19	0	6	0	3	0	39	119
South Bend	4	6	1	0	0	2	0	0	0	8	31
Terre Haute	3	3	1	0	0	0	0	0	0	3	18
Illinois:											
Chicago	111	156	2	4	0	65	3	0	0	40	741
Peoria	3	3	1	0	0	2	0	0	0	7	24
Springfield	1	4	1	0	0	0	1	1	0	16	12
Michigan:											
Detroit	79	113	3	1	0	30	2	1	0	56	332
Flint	5	22	2	0	0	1	0	0	0	12	29
Grand Rapids	6	19	1	0	0	0	0	0	0	18	39
Wisconsin:											
Kenosha	2	4	0	0	0	0	1	0	0	6	10
Madison	2	4	0	0	0	0	0	0	0	2	11
Milwaukee	25	18	5	0	0	11	1	0	0	52	117
Racine	5	0	1	0	0	1	0	0	0	24	9
Superior	2	1	2	0	0	0	1	1	0	0	9
WEST NORTH CENTRAL											
Minnesota:											
Duluth	4	49	1	0	0	1	1	0	0	8	31
Minneapolis	30	67	8	0	0	5	1	1	0	3	112
St. Paul	22	29	4	0	0	2	0	0	0	37	60

[1] Pulmonary tuberculosis only.

City reports for week ended May 15, 1926—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST NORTH CENTRAL—continued											
Iowa:											
Davenport	1	1	4	0	----	----	0	0	----	0	----
Des Moines	8	6	2	2	----	----	0	0	----	0	----
Sioux City	3	7	1	4	----	----	0	0	----	7	----
Waterloo	1	1	0	0	----	----	0	0	----	6	----
Missouri:											
Kansas City	9	----	3	----	----	----	0	----	----	----	----
St. Joseph	2	3	0	0	0	2	0	0	0	0	38
St. Louis	30	158	4	2	0	7	2	0	0	48	209
North Dakota:											
Fargo	1	6	0	0	0	0	0	0	0	0	4
Grand Forks	1	----	0	----	----	----	0	----	----	----	----
South Dakota:											
Aberdeen	1	15	0	0	----	----	0	0	----	13	----
Sioux Falls	1	5	0	0	0	0	0	0	0	0	2
Nebraska:											
Lincoln	2	1	0	1	0	0	0	0	0	24	13
Omaha	5	77	6	12	1	2	0	0	0	0	61
Kansas:											
Topeka	2	6	0	0	0	1	0	0	0	7	13
Wichita	2	2	3	0	0	0	0	0	0	12	25
SOUTH ATLANTIC											
Delaware:											
Wilmington	4	8	0	0	0	2	0	0	0	2	27
Maryland:											
Baltimore	26	44	0	0	0	26	3	1	0	62	239
Cumberland	1	2	0	0	0	1	1	0	0	3	10
Frederick	1	0	0	0	0	0	0	0	0	0	3
District of Columbia:											
Washington	20	36	2	0	0	10	1	0	0	33	151
Virginia:											
Lynchburg	0	4	0	0	0	0	0	0	0	3	6
Norfolk	1	7	0	1	0	1	0	0	0	9	----
Richmond	3	4	0	0	0	1	1	0	0	2	41
Roanoke	1	0	1	4	0	1	0	0	0	0	14
West Virginia:											
Charleston	1	0	1	0	0	1	0	0	0	2	25
Huntington	1	1	0	0	0	5	0	0	0	0	13
Wheeling	2	3	0	0	0	1	0	1	0	0	27
North Carolina:											
Raleigh	0	1	0	1	0	0	0	0	0	15	20
Wilmington	1	0	0	0	0	2	0	0	0	0	12
Winston-Salem	0	1	4	1	0	4	0	0	0	0	28
South Carolina:											
Charleston	1	0	0	1	0	1	1	0	0	2	20
Columbia	0	0	1	0	0	0	0	0	0	1	----
Greenville	0	1	0	1	0	1	1	0	0	4	8
Georgia:											
Atlanta	4	6	5	1	0	4	1	0	1	11	75
Brunswick	0	0	0	0	0	0	1	0	0	0	4
Savannah	0	0	0	0	0	1	0	0	0	0	29
Florida:											
Miami	----	0	----	3	0	2	----	2	0	4	34
St. Petersburg	0	----	0	----	0	1	0	----	0	----	23
Tampa	0	1	0	11	0	1	1	0	1	0	43
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	3	0	3	0	2	0	0	0	2	19
Louisville	5	16	0	2	0	7	1	0	1	1	86
Tennessee:											
Memphis	4	18	3	1	0	4	1	0	0	1	59
Nashville	2	1	1	0	0	0	1	0	0	13	50
Alabama:											
Birmingham	2	1	7	11	0	2	1	0	0	26	65
Mobile	1	0	1	1	0	1	1	0	0	0	14
Montgomery	0	0	1	5	0	0	0	0	0	0	8

City reports for week ended May 15, 1926—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	0	0	0			0	0		8	
Little Rock	1	8	1	0	0	0	0	0	0	1	
Louisiana:											
New Orleans	3	21	2	5	0	11	3	7	1	3	135
Shreveport	0	0	2	1	0	4	0	0	0	4	37
Oklahoma:											
Oklahoma City	1	0	4	1	0	0	0	1	0	0	22
Texas:											
Dallas	2	6	3	8	0	2	0	0	0	5	34
Galveston	0	0	1	2	0	6	1	1	0	0	11
Houston	1	1	0	11	0	0	0	2	0	0	33
San Antonio	0	0	0	0	0	10	0	0	0	0	59
MOUNTAIN											
Montana:											
Billings	1	0	1	0	0	0	0	0	0	1	3
Great Falls	1	0	2	0	0	0	0	0	0	4	9
Helena	1	0	0	0	0	0	0	0	0	0	4
Missoula	1	1	0	0	0	0	0	0	0	0	5
Idaho:											
Boise	1	1	0	4	0	0	0	0	0	0	5
Colorado:											
Denver	11	21	2	1	0	12	0	0	0	36	86
Pueblo	1	1	0	0	0	0	0	1	1	9	11
New Mexico:											
Albuquerque	0	3	0	0	0	4	0	0	0	13	11
Arizona:											
Phoenix	1	1	0	0	0	8	0	0	0	0	27
Utah:											
Salt Lake City	2	3	0	1	0	2	0	0	0	66	37
Nevada:											
Reno	0	0	1	0	0	0	0	0	0	0	3
PACIFIC											
Washington:											
Seattle	8	21	4	5			0	0		9	
Spokane	3	8	5	0			0	0		4	
Tacoma	2	2	1	3	0	2	0	0	0	0	29
Oregon:											
Portland	7	18	8	3	0	3	0	0	0	0	52
California:											
Los Angeles	17	33	3	5	2	25	2	0	0	4	231
Sacramento	2	4	0	1	0	3	0	2	1	2	25
San Francisco	14	28	2	11	0	6	1	1	0	4	118

City reports for week ended May 15, 1926—Continued.

Division, State and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	0	2	0	0	0	0	1	1
Springfield	0	0	2	1	0	0	0	0	0
Rhode Island:									
Providence	0	0	0	1	0	0	0	0	0
Connecticut:									
Bridgeport	0	0	1	1	0	0	0	0	0
New Haven	1	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	7	4	6	4	0	0	1	1	0
New Jersey:									
Newark	1	0	1	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	0	0	1	1	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	0	0	0	0	0	1	0	0	0
Illinois:									
Chicago	1	2	0	0	0	0	0	0	0
Michigan:									
Detroit	0	0	0	1	0	0	0	0	0
Wisconsin:									
Racine	0	0	1	1	0	0	0	0	0
WEST NORTH CENTRAL									
Missouri:									
St. Louis	1	0	0	0	0	0	0	0	0
Nebraska:									
Omaha	0	0	0	0	1	1	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	1	0	0	0	0	0	0	0
Virginia:									
Richmond	0	0	0	0	0	0	0	1	1
North Carolina:									
Raleigh	0	1	0	0	0	0	0	0	0
Florida:									
Tampa	1	0	0	0	0	0	0	0	0
EAST SOUTH CENTRAL									
Alabama:									
Birmingham	0	0	0	1	1	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	1	0	0	0	0
Texas:									
Dallas	0	0	0	0	0	2	0	0	0
Houston	1	0	0	0	0	1	0	0	0
PACIFIC									
Washington:									
Spokane	2		0		0		0	0	
Tacoma	1	0	0	0	0	0	0	0	0
Oregon:									
Portland	0	0	0	1	0	0	0	0	0
California:									
Los Angeles	3	0	2	0	1	0	1	0	0
San Francisco	0	0	0	0	1	0	0	0	0

The following table gives the rates per 100,000 population for 103 cities for the five-week period ended May 15, 1926, compared with those for a like period ended May 16, 1925. The population figures used in computing the rates are approximate estimates as of July 1, 1925 and 1926, respectively, authoritative figures for many of the cities not being available. The 103 cities reporting cases had an estimated aggregate population of nearly 30,000,000 in 1925 and nearly 30,500,000 in 1926. The 96 cities reporting deaths had more than 29,250,000 estimated population in 1925 and more than 29,750,000 in 1926. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, April 11 to May 15, 1926—Annual rates per 100,000 population—Compared with rates for the corresponding period of 1925 [1]

DIPHTHERIA CASE RATES

	Week ended									
	Apr. 18, 1925	Apr. 17, 1926	Apr. 25, 1925	Apr. 24, 1926	May 2, 1925	May 1, 1926	May 9, 1925	May 8, 1926	May 16, 1925	May 15, 1926
103 cities	155	110	155	118	152	110	[2] 152	[2] 115	[4] 158	[4] 122
New England	125	47	139	73	122	83	105	106	149	87
Middle Atlantic	227	118	217	162	212	114	211	[6] 126	237	135
East North Central	103	86	106	87	102	97	106	89	[7] 102	96
West North Central	163	241	181	178	195	200	269	[8] 195	205	[4] 228
South Atlantic	96	90	102	68	98	68	98	75	81	77
East South Central	42	47	37	26	37	73	11	62	32	52
West South Central	70	30	75	47	66	56	62	60	53	82
Mountain	231	191	259	82	111	118	102	146	148	182
Pacific	160	135	157	146	196	154	[4] 117	[10] 165	[10] 132	175

MEASLES CASE RATES

103 cities	564	1,769	620	1,790	559	1,706	[2] 603	[3] 1,712	[4] 599	[5] 1,557
New England	884	1,813	1,174	1,666	968	1,529	949	1,714	1,145	1,198
Middle Atlantic	811	1,699	779	1,593	731	1,417	793	[6] 1,410	765	1,198
East North Central	681	1,469	833	1,457	706	1,486	830	1,454	[7] 795	1,371
West North Central	88	3,309	98	4,079	76	3,988	109	[8] 4,458	76	[5] 4,451
South Atlantic	242	2,943	278	2,538	288	2,528	227	1,942	311	1,933
East South Central	89	2,781	173	3,445	184	2,885	315	3,243	152	3,461
West South Central	62	133	35	163	26	159	31	125	13	155
Mountain	259	528	213	1,074	518	865	176	883	55	1,393
Pacific	146	375	193	504	155	669	[2] 91	[9] 690	[10] 170	679

SCARLET FEVER CASE RATES

103 cities	329	307	438	283	297	292	[2] 311	[7] 294	[4] 338	[4] 326
New England	338	373	393	222	415	281	400	222	345	312
Middle Atlantic	341	187	335	201	322	221	318	[6] 217	330	249
East North Central	376	343	410	287	302	289	341	[7] 313	[7] 368	356
West North Central	631	895	671	883	502	867	599	[8] 953	705	[4] 953
South Atlantic	157	182	165	160	125	218	100	177	156	222
East South Central	210	156	236	228	242	171	242	187	299	202
West South Central	57	133	114	172	106	146	84	176	70	155
Mountain	305	173	388	209	324	218	268	137	342	246
Pacific	138	340	141	262	119	205	[2] 144	[10] 197	[10] 187	259

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1925 and 1926, respectively.
[2] Spokane, Wash., not included.
[3] Trenton, N. J., Grand Forks, N. Dak., and Tacoma, Wash., not included.
[4] Superior, Wis., and Tacoma, Wash., not included.
[5] Kansas City, Mo., and Grand Forks, N. Dak., not included.
[6] Trenton, N. J., not included.
[7] Superior, Wis., not included.
[8] Grand Forks, N. Dak., not included.
[9] Tacoma, Wash., not included.

Summary of weekly reports from cities, April 11 to May 15, 1926—Annual rates per 100,000 population—Compared with rates for the corresponding period of 1925— Continued

SMALLPOX CASE RATES

	Week ended									
	Apr. 18, 1925	Apr. 17, 1926	Apr. 25, 1925	Apr. 24, 1926	May 2, 1925	May 1, 1926	May 9, 1925	May 8, 1926	May 16, 1925	May 15, 1926
103 cities	46	26	60	31	48	26	[2] 45	[3] 26	[4] 44	[5] 26
New England	0	0	2	0	0	0	2	0	0	0
Middle Atlantic	18	0	12	0	8	0	6	[6] 0	7	0
East North Central	25	14	37	22	29	19	41	22	[7] 53	20
West North Central	82	44	86	44	72	32	58	[8] 58	76	[8] 42
South Atlantic	50	43	75	47	60	28	42	30	35	39
East South Central	362	52	420	99	399	99	347	73	173	119
West South Central	13	95	40	112	31	146	26	159	35	116
Mountain	9	27	28	46	9	36	46	36	28	55
Pacific	155	137	251	140	196	102	[2] 167	[10] 54	[10] 181	67

TYPHOID FEVER CASE RATES

103 cities	11	7	16	8	17	9	[2] 13	[3] 7	[4] 13	[5] 8
New England	7	9	17	5	10	5	5	9	12	0
Middle Atlantic	11	7	14	8	22	6	13	[6] 6	10	10
East North Central	4	2	6	1	4	4	8	4	[7] 6	5
West North Central	2	4	6	6	12	6	2	[8] 6	0	[8] 2
South Atlantic	12	4	13	8	27	19	27	13	25	4
East South Central	32	0	74	26	42	21	42	16	58	6
West South Central	53	34	48	26	48	17	44	17	75	43
Mountain	37	9	28	0	0	18	0	0	0	9
Pacific	11	13	22	22	17	27	[9] 9	[10] 9	[10] 3	8

INFLUENZA DEATH RATES

96 cities	26	53	29	38	21	33	14	[11] 25	[10] 14	[9] 16
New England	26	52	29	40	19	35	10	14	7	5
Middle Atlantic	24	59	17	34	14	27	10	[6] 22	12	17
East North Central	23	67	31	42	21	46	15	29	10	18
West North Central	49	23	47	31	30	17	11	13	11	[9] 7
South Atlantic	10	43	40	30	25	28	19	19	10	17
East South Central	74	47	79	104	47	99	47	99	74	31
West South Central	10	57	24	66	29	28	15	47	19	28
Mountain	37	46	74	46	46	9	18	18	55	16
Pacific	25	21	11	4	11	11	15	[10] 4	[10] 12	4

PNEUMONIA DEATH RATES

96 cities	184	241	196	201	160	177	145	[11] 163	[10] 123	[9] 150
New England	199	303	180	234	144	210	156	170	129	165
Middle Atlantic	203	288	222	240	206	219	184	[6] 173	143	165
East North Central	178	232	199	191	138	152	123	178	118	147
West North Central	165	131	131	136	70	106	74	121	55	[9] 79
South Atlantic	217	207	180	205	180	177	148	169	129	182
East South Central	189	332	263	259	179	233	147	223	152	182
West South Central	92	194	150	137	121	161	131	118	106	137
Mountain	203	155	213	109	120	118	120	82	157	91
Pacific	87	117	131	71	113	75	109	[10] 84	[10] 75	92

[2] Spokane, Wash., not included.
[3] Trenton, N. J., Grand Forks, N. Dak., and Tacoma, Wash., not included.
[4] Superior, Wis., and Tacoma, Wash., not included.
[5] Kansas City, Mo., and Grand Forks, N. Dak., not included.
[6] Trenton, N. J., not included.
[7] Superior, Wis., not included.
[8] Grand Forks, N. Dak., not included.
[9] Kansas City, Mo., not included.
[10] Tacoma, Wash., not included.
[11] Trenton, N. J., and Tacoma, Wash., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1925 and 1926, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1925	1926	1925	1926
Total	103	96	29,944,996	30,473,129	29,251,658	29,764,201
New England	12	12	2,176,124	2,206,124	2,176,124	2,206,124
Middle Atlantic	10	10	10,346,970	10,476,970	10,346,970	10,476,970
East North Central	16	16	7,491,656	7,655,436	7,491,656	7,655,436
West North Central	14	11	2,594,962	2,634,662	2,461,380	2,499,036
South Atlantic	21	21	2,716,070	2,776,070	2,716,070	2,776,070
East South Central	7	7	993,103	1,004,953	993,103	1,004,953
West South Central	8	6	1,184,057	1,212,087	1,078,198	1,103,695
Mountain	9	9	563,912	572,773	563,912	572,773
Pacific	6	4	1,888,142	1,934,984	1,434,245	1,469,144

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended May 8, 1926.—The following report for the week ended May 8, 1926, was transmitted by the Far Eastern Bureau of the health section of the League of Nation's Secretariat, located at Singapore, to the headquarters at Geneva.

Maritime towns	Plague		Cholera		Smallpox		Maritime towns	Plague		Cholera		Smallpox	
	Cases	Deaths	Cases	Deaths	Cases	Deaths		Cases	Deaths	Cases	Deaths	Cases	Deaths
British India:							Hongkong	0	0	0	0	2	1
Bombay	----	1	----	0	24	12	China:						
Madras	----	0	----	0	4	1	Shanghai	0	0	0	0	----	
Karachi	----	1	----	0	21	1	Amoy	2	1	0	0	3	
Iraq:							Japan:						
Basra	0	0	0	0	6	3	Yokohama	0	0	0	0	2	0
Straits Settlements:							Osaka	0	0	0	0	1	0
Singapore	1	1	0	0	0	0	Korea: Fusan	0	0	0	0	1	0
Siam: Bangkok	0	0	255	145	1	4	Kwantung:						
French Indo-China:							Dairen	0	0	0	0	22	5
Saigon and Cholon	0	0	34	22	0	0	Port Arthur	0	0	0	0	2	0

Telegraphic reports from the following maritime towns indicated that no case of plague, cholera, or smallpox was reported during the week:

ASIA

British India.—Negapatam, Chittagong, Cochin, Tuticorin.
Ceylon.—Colombo.
Federated Malay States.—Port Swettenham.
Straits Settlements.—Penang.
Dutch East Indies.—Batavia, Surabaya, Samarang, Cheribon, Belawan Deli, Palembang, Sabang, Makassar, Menado, Banjermasin, Balik-Papan, Pontianak.
Sarawak.—Kuching.
British North Borneo.—Sandakan.
Portuguese Timor.—Dilly.
Philippine Islands.—Manila, Iloilo, Jolo, Cebu, Zamboanga.
French Indo-China.—Haiphong, Turane.
Formosa.—Keelung.
Japan.—Nagasaki, Simonoseki, Moji, Kobe, Niigata, Tsuruga, Hakodate.
Korea.—Chemulpo.
South Manchuria.—Antung, Mukden, Changchun.

AUSTRALASIA AND OCEANIA

Australia.—Adelaide, Melbourne, Sydney, Brisbane, Rockhampton, Townsville, Port Darwin, Broome, Fremantle.
New Guinea.—Port Moresby.
New Zealand.—Auckland, Wellington, Christchurch, Invercargill, Dunedin.
New Caledonia.—Noumea.
Hawaii.—Honolulu.

AFRICA

Egypt.—Alexandria, Port Said, Suez.
Anglo-Egyptian Sudan.—Port Sudan.
Eritrea.—Massaua.
French Somaliland.—Djibuti.
British Somaliland.—Berbera.
Italian Somaliland.—Mogadiscio.
Kenya.—Mombasa.
Sechelles.—Victoria.
Mauritius.—Port Louis.
Portuguese East Africa.—Mozambique, Lorenco Marques.
Union of South Africa.—Durban, East London, Port Elizabeth, Cape Town.

Reports had not been received in time for distribution from:

British India.—Calcuttta, Rangoon.
Dutch East Indies.—Padang, Tarakan.
Zanzibar.—Zanzibar.
Madagascar.—Tamatave, Majunga.

CANADA

Mortality from certain communicable diseases, Province of Quebec—January, 1926.—During the month of January, 1926, deaths from certain communicable diseases were reported in the Province of Quebec, Canada, as follows: Diphtheria, 44; measles, 32; scarlet fever, 16; tuberculosis (pulmonary), 173; other forms of tuberculosis, 37; typhoid fever, 12; whooping cough, 32.

General mortality.—The total number of deaths from all causes, exclusive of stillbirths, was 2,955. Population, estimated, 2,570,000.

Mortality from certain other diseases.—During the month of January, 1926, 113 deaths from cancer and 324 deaths from diseases of the heart, were reported in the Province. Of these, 36 deaths from cancer and 89 of heart affections occurred at Montreal (population, 675,000), and at Quebec, 5 deaths from cancer and 20 from heart affections (population, 124,341).

IRELAND (FREE STATE)

Typhus fever—Cork District—May 2–8, 1926.—During the week ended May 8, 1926, a case of typhus fever was reported in the urban district of Cork, Irish Free State, Ireland.

UNION OF SOUTH AFRICA

Plague—Cape Province—Orange Free State—April 4–10, 1926.—During the week ended April 10, 1926, plague was reported in the Union of South Africa as follows: Cape Province—one fatal case, bubonic, in a native, occurring in Cradock District; Orange Free State—two native cases occurring in Hoopstad District.

Typhus fever.—During the same period typhus fever was reported in the Union of South Africa as follows: In Natal, one case at Port Shepstone and three cases at Durban (sporadic); outbreaks in Mount Currie and Tsolo Districts.

YUGOSLAVIA

Communicable diseases—February 22–March 21, 1926.—During the period February 22 to March 21, 1926, communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	20	3	Rabies	8	8
Cerebrospinal meningitis	28	2	Scarlet fever	488	104
Diphtheria and croup	157	32	Tetanus	14	9
Dysentery	19		Typhoid fever	151	26
Lethargic encephalitis	2	1	Typhus fever	24	6
Measles	1,378	12	Whooping cough	315	10

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 June 4 1926 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
India				Mar. 21–Apr. 3, 1926: Cases, 7,074; deaths, 3,962.
Calcutta	Mar. 28–Apr. 3	37	30	
Rangoon	Apr. 11–17	6	6	
Indo-China (French):				
Saigon	May 20			Present.
Siam:				
Bangkok	Apr. 4–10	102	61	

PLAGUE

British East Africa:				
Uganda	Feb. 1–28	50	42	
China:				
Nanking	Apr. 11–24			Prevalent.
India				Mar. 21–Apr. 3, 1926: Cases, 21,012; deaths, 16,627.
Bombay	Apr. 4–10	2	1	
Karachi	Apr. 18–24	4	1	
Madras (Presidency)	Mar. 27–Apr. 3	38	22	
Rangoon	Apr. 11–17	5	5	
Iraq:				
Bagdad	Mar. 21–Apr. 17	33	15	
Java:				
East Java and Madoera	Feb. 28–Mar. 6	5	5	
Surabaya	Mar. 14–27	3	3	
Siam:				
Bangkok	Apr. 4–10	2		
Union of South Africa				Apr. 4–10, 1926: Cases, 3; deaths, 1. Native.
Cape Province	Apr. 4–10	1	1	
Orange Free State	do	2		Native.

SMALLPOX

Algeria	Apr. 11–20	3	
Brazil:			
Para	May 2–8	2	2
British East Africa:			
Uganda	Feb. 1–28	1	
Canada:			
Toronto	May 9–15	3	

[1] 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 June 4, 1926—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
China:				
Amoy	Apr. 5–17		9	
Foochow	Apr. 11–17			Present.
Manchuria—				
Anshan	Apr. 18–24	1		South Manchuria Ry. Line
Antung	do	2		Do.
Changchun	do	2		Do.
Fushun	do	2		Do.
Harbin	Apr. 16–22	4		Do.
Liao-yang	Apr. 18–24	1		Do.
Tieh-ling	do	1		Do.
Nanking	Apr. 11–24			Present.
Shanghai	Apr. 4–17	1	6	Cases, foreign; deaths, Chinese and foreign.
Swatow	Apr. 11–24			Sporadic.
France:				
Paris	Apr. 21–30	1		
Great Britain:				
Bradford	May 2–8	1		
Newcastle-on-Tyne	do	1		
Nottingham	Apr. 18–24	2		
Sheffield	Apr. 25–May 8	3		
India				Mar. 21–Apr. 3, 1926: Cases, 13,966; deaths, 3,254.
Bombay	Apr. 4–10	36	20	
Calcutta	Mar. 28–Apr. 3	33	31	
Karachi	Apr. 18–24	14	4	
Madras	do	3	1	
Rangoon	Apr. 11–17	1	2	
Iraq:				
Bagdad	Mar. 21–Apr. 17	3	2	
Basra	Mar. 14–Apr. 17	15	9	
Italy:				
Catania	Apr. 27–May 2	4		
Japan:				
Yokohama	Apr. 11–17	4		
Java:				
East Java and Madoera	Mar. 14–27	4	3	
Mexico:				
Chihuahua	May 9–17	7		
Ciudad Juarez	do		1	
Guadalajara	May 11–17		1	
Mexico City	Apr. 25–May 1	6		Including municipalities in Federal district.
San Luis Potosi	May 9–15		8	
Torreon	Apr. 1–30		15	
Senegal:				
Dakar	Apr. 19–25	1		
Siam:				
Bangkok	Apr. 4–10	9	5	
Spain:				
Valencia	May 2–8	3		
Syria:				
Damascus	Apr. 11–20	1		

TYPHUS FEVER

Greece:				
Saloniki	Apr. 13–19	1		
Ireland (Free State):				
Cork District	May 2–8	1		
Latvia	Feb. 1–28	18		
Mexico:				
Aguascalientes	May 2–8		1	
Mexico City	Apr. 25–May 1	10		Including municipalities in Federal District.
Union of South Africa				Apr. 4–10, 1926: Outbreaks in Mount Currie and Tsolo District.
Cape Province	Feb. 27–Apr. 2	1		
Natal—				
Durban	Apr. 4–17	4		
Port Shepstone	Apr. 4–10	1		
Yugoslavia				Feb. 22–Mar. 21, 1926: Cases, 24; deaths, 6.

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

Reports Received from December 26, 1925, to May 28, 1926 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
Chosen	October-November, 1925.	12	5	
French Settlements in India	Dec. 1-31	880	712	
India				Oct. 18, 1925, to Jan. 2, 1926: Cases, 21,316; deaths, 12,371. Jan. 3-Mar. 13, 1926: Cases, 31,105; deaths, 17,859.
Calcutta	Nov. 1-28	101	89	
Do	Dec. 6-26		54	
Do	Dec. 27-Jan. 16		41	
Do	Jan. 24-Apr. 3	464	417	
Madras	Nov. 15-Jan. 2	174	70	
Do	Jan. 3-Apr. 17	146	90	
Rangoon	Nov. 8-Dec. 3	4	4	
Do	Jan. 24-Apr. 10	17	14	
Indo-China				September-December, 1925: Cases, 11; deaths, 7.
Province—				
Annam	Sept. 1-30	2	2	
Cambodia	Dec. 1-31	2	1	
Cochin China	Sept. 1-Dec. 31	6	4	
Saigon	Jan. 4-17	2	2	Including 100 square kilometers of surrounding country.
Tonkin	Sept. 1-Nov. 30	3		
Japan	Aug. 30-Oct. 17	409		
Do	Oct. 25-Dec. 26	113		
Do	Jan. 17-30	5		
Philippine Islands:				
Manila	Nov. 9-Jan. 3	15	10	
Do	Jan. 4-Mar. 6		27	
Province—				
Bataan	Nov. 30-Dec. 26	29	25	
Do	Jan. 2-16	1	1	
Batangas	Jan. 24-Feb. 20	13	13	
Bohol	Jan. 23-30	1	1	
Bulacan	Oct. 18-Nov. 7	92	64	
Do	Nov. 23-Dec. 31	200	88	
Do	Jan. 2-30	6	6	
Laguna	Nov. 23-Dec. 26	18	14	
Do	Jan. 24-Feb. 6	5	6	
Leyte	Jan. 3-9	2	2	
Mindoro	Dec. 20-31	35	30	
Nueva Ecija	Nov. 30-Dec. 13	7	5	
Pampanga	Nov. 1-7	1	1	
Do	Nov. 23-Dec. 31	113	85	
Do	Jan. 2-Mar. 3	39	35	
Rizal	Sept. 27-Nov. 21	75	21	
Do	Dec. 21-30	14	11	
Do	Jan. 3-Feb. 20	89	30	
Romblon	Nov. 8-Dec. 13	27	14	
Russia	May-June	7		
Do	July-August	4		
Siam:				
Bangkok	Oct. 4-Nov. 14	108	68	
Do	Nov. 22-Dec. 26	270	149	
Do	Dec. 27-Mar. 13	398	275	
Do	Mar. 21-27	90	52	
On vessel:				
Steamship	Oct. 3	9		Arrived at Bangkok, Siam: Cases in coolie passengers.

PLAGUE

Argentina				Jan. 24-30, 1926: 6 cases, occurring in interior Provinces of Salta and Santa Fe.
Buenos Aires	Jan. 24-30	1		
Azores:				
St. Michaels	Jan. 17-Apr. 3	9	4	
Belgium:				
Vilvorde	Dec. 1-8	1	1	
Brazil:				
Bahia	Nov. 8-Dec. 28	3	1	
Do	Dec. 27-Jan. 30	4	2	
Santos	Dec. 8-21		2	
Sao Paulo	Reported Mar. 25	4	1	

[1] 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 26, 1925, to May 28, 1926—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
British East Africa:				
Kenya—				
Kisumu	Nov. 22-Dec. 5	1	2	
Do	Jan. 31-Mar. 20	15	3	
Uganda Protectorate	Sept. 1-Dec. 31	468	426	
Do	Jan. 1-31	109	101	
Canary Islands:				
La Laguna	Dec. 24	3	2	
Las Palmas	do	1		
Do	Jan. 7	1	1	
Santa Cruz de Tenerife	Dec. 18-27	3		
Do	Dec. 28-Feb. 1	3		
Celebes:				
Makassar	Dec. 29-Feb. 2	12	12	Netherlands East Indies.
Ceylon:				
Colombo	Nov. 15-Dec. 5	3	3	1 plague rodent.
Do	Dec. 27-Jan. 16	2	2	
Do	Jan. 24-Mar. 6	5	5	Feb. 14-20, 1926: Two plague rodents.
China:				
Nanking	Nov. 15-Mar. 27			Prevalent.
Ecuador:				
Ambato	Mar. 31		5	
Eloy Alfaro	Jan. 1-15	1		
Guayaquil	Nov. 1-Dec. 31	31	12	Rats taken, Nov. 1-Dec. 31, 1925, 49,370; rats found infected, 281.
Do	Jan. 1-Apr. 15	63	28	Rats taken, Jan. 1-Mar. 31, 1926, 73,499; rats found infected, 592.
Latacunga	Apr. 12			Present.
Recreo (country estate)	do	1		
Egypt				Jan. 1-Dec. 9, 1925: Cases, 138. Jan. 1-Apr. 8, 1926: Cases, 10.
Alexandria	Mar. 10-Apr. 16	3	1	
Beni Suef	Nov. 18	1	1	
Fayoum Province	Dec. 3-9	1	1	
Gharbia Province	Mar. 9-30	5	3	
Mina Province	Mar. 4	1	1	
Suez	Mar. 27-Apr. 19	4	1	
Greece:				
Athens	Nov. 1-30	18	4	Including Piræus.
Do	Jan. 1-Mar. 31	25	4	
Herakleion	Feb. 4	1		On island of Crete.
Patras	Nov. 13-Dec. 12	4	1	
Hawaii Territory	Feb. 2			1 plague-infected rodent found near Hamakua Mill Co.
Hawaii—				
Honokaa	Mar. 16	2		1 death suspected plague.
Kakuihaela	Mar. 19	1	1	
Paauilo				Jan. 29, 1926: Plague-infected rat found in vicinity.
India				Oct. 18, 1925-Jan. 2, 1926: Cases, 15,135; deaths, 10,677. Jan. 3-Mar. 13, 1926: Cases, 53,563; deaths, 41,553.
Bombay	Dec. 6-12	1	1	
Do	Jan. 3-Apr. 3	5	11	
Calcutta	Dec. 6-12		1	
Karachi	Nov. 1-Dec. 19	4	3	
Do	Feb. 21-Apr. 17	18	9	
Madras Presidency	Oct. 25-Nov. 7	75	41	
Do	Nov. 15-21	35	22	
Do	Dec. 20-26	108	64	
Do	Jan. 3-Mar. 20	1,229	773	
Do	Apr. 11-17	25	18	
Rangoon	Oct. 25-Dec. 26	23	15	
Do	Dec. 27-Apr. 10	119	109	
Indo-China				September-December, 1925: Cases, 28; deaths, 26.
Province—				
Cambodia	Sept. 1-Nov. 30	13	13	
Cochin China	Sept. 1-Dec. 31	15	13	
Iraq:				
Bagdad	Dec. 13-Jan. 2	7	3	
Do	Jan. 10-Mar. 20	78	46	
Java:				
Batavia	Oct. 24-Nov. 6	94	89	Province.
Do	Nov. 14-Jan. 1	315	297	
Do	Jan. 2-Mar. 12	483	468	
Do	Mar. 19-Apr. 2	19	19	
Cheribon	Sept. 27-Oct. 17		166	
Do	Nov. 15-Dec. 26		198	
Do	Jan. 3-Mar. 6		191	

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

Reports Received from December 26, 1925, to May 28, 1926—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Java—Continued.				
Djokjakarta	Oct. 20–Nov. 9			Epidemic in 1 locality.
Kediri	Dec. 7			Do.
Koeningan	Dec 27–Jan. 16		114	
Do	Feb. 7–Mar. 6		103	
Pekalongan	Sept. 27–Oct. 17		42	
Do	Nov. 8–Dec. 26		252	
Do	Feb. 14–Mar. 6		123	
Probolinggo	Feb. 12			Epidemic. Port.
Rembang	Oct. 20			Do.
Surabaya	Oct. 11–Dec. 26	59	59	
Do	Dec. 27–Mar. 13	42	42	
Tegal	Sept. 27–Oct. 17	6	6	
Do	Nov. 8–Dec. 26		31	
Do	Feb. 21–Mar. 6		11	
Madagascar				Nov. 1–December 31, 1925: Cases, 632; deaths, 593. Jan. 1–31, 1926: Cases, 611; deaths, 565. Mar. 1–15, 1926: Cases, 111; deaths, 79.
Province—				
Ambositra	Dec. 16–31	9	7	
Do	Jan. 1–15	2	2	
Fort Dauphin	Sept. 16–30	6	3	
Do	Jan. 16–Mar. 15	4	4	
Itasy	Sept. 16–Oct. 30	20	20	
Do	Nov. 16–Dec. 31	34	34	
Do	Jan. 1–15	29	29	
Do	Feb. 1–15	29	29	
Moramanga	Sept. 16–Dec. 31	49	48	
Do	Jan. 1–Mar. 15	51	47	
Tananarive				Sept. 16–Nov. 30, 1925: Cases, 368; deaths, 341. Dec. 16–31, 1925: Cases, 152; deaths, 143. Jan. 1–Mar. 15, 1926: Cases, 583; deaths, 486.
Town—				
Tamatave (Port)	Sept. 16–Nov. 30	42	11	
Do	Feb. 1–Mar. 15	5	3	
Tananarive	Sept. 16–30	2	2	
Do	Nov. 1–30	11	11	
Do	Jan. 1–Mar. 15	40	40	
Mauritius Island	Sept. 20–Dec. 26	21	16	
Moca	Dec. 1–31	2	2	
Pamplemousses	Oct. 1–Nov. 30	3	2	
Port Louis	Oct. 1–Dec. 31	13	9	
Rivière du Rempart	October	2		
Nigeria	Aug. 1–Dec. 31	594	447	
Do	Jan. 1–31	24	21	
Persia:				
Teheran	Oct. 21–Nov. 21		12	
Peru				January–March, 1926: Cases, 383; deaths, 148.
Barranca and Supo	Mar. 1–31	4	6	
Cañete	do	1		
Caras	do			Present.
Cascas	do	15	5	
Chiclayo	do		4	
Chimbote	do	16	8	Country estates.
Chincha	do	14	5	
Contumazá	do	12		
Cutorvo	do			Present.
Huacho	Jan. 26	15		Port 60 miles north of Callao.
Lácrahmarca	Mar. 1–31	6		
Lima	Jan. 1–31	20		In hospital. Some cases in Province.
Mollendo	do			12 or 15 cases reported unofficially.
Do	Mar. 1–31			
Moro	do			Present.
Otuzco	do	1		
Pacasmayo	do	2	1	
Salaverry	do	5	2	
San Pablo	do			Do.
Trujillo	do	15	5	
Russia	May–June	67		
Do	July–November	217		
Senegal	September–October.	45	25	
Siam	Aug. 23–Dec. 26	65	53	
Do	Dec. 27–Jan. 30	16	9	
Bangkok	Nov. 15–28	3	3	
Do	Jan. 3–30	38	33	
Do	Feb. 7–20	11	5	
Do	Feb. 28–Mar. 20	3	2	
Straits Settlements:				
Singapore	Nov. 1–Dec. 5	8	8	
Do	Jan. 3–Mar. 20	3	3	

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

Reports Received from December 26, 1925, to May 28, 1926—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Syria:				
Beirut	Nov. 11-20	1		
Do	Jan. 21-31	1		
Union of South Africa				Mar. 7-13, 1926: Cases, 3; European, 2. Mar. 21-27, 1926: Cases, 12; deaths, 4.
Cape Province—				
Kimberley district	Dec. 13-19	1		
Middleburg district	Dec. 6-12	1		European.
Steynsburg district	Nov. 15-21	1		Native. On farm.
Winburg district	Feb. 21-27	1		
Orange Free State				Mar. 14-Apr. 3, 1926: Cases, 9; deaths, 5.
Boshof district	Nov. 29-Dec. 5	1	1	In native.
Bothaville district	Dec. 6-12	1	1	Native. On farm.
Bradford district	Mar. 28-Apr. 3	1	1	
Grandfort district	Mar. 21-27	3	1	European, in same family, pneumonic.
Hoopstad district	Mar. 7-Apr. 3	8	4	
Kroonstad district	Mar. 14-20	1		Native. On farm.
Winburg district	Mar. 14-Apr. 3	11	5	
On vessel:				
Steamship Cid				Jan. 29, 1926. Plague rat. At Buenaventura, Colombia. Rat was killed while jumping ashore from vessel.

SMALLPOX

Algeria:				
Algiers	Nov. 21-Dec. 31	177		
Do	Jan. 1-10	64		
Do	Jan. 21-Apr. 10	75		
Arabia:				
Aden	Nov. 29-Dec. 5	1		Imported.
Do	Jan. 10-Mar. 6	10	1	
Argentina:				
Rosario	October		1	
Australia:				
Queensland—				
Brisbane	Dec. 9-15	1		
Azores:				
Fayal Island	Feb. 2-Apr. 11			Present. Reported as alastrim.
Bahamas	Feb. 23			In Nassau district. Stated to have been imported.
Brazil:				
Manaos	Dec. 1-31		12	
Do	Jan. 31-Feb. 20		6	
Para	Jan. 10-Apr. 24	33	8	
Rio de Janeiro	Nov. 1-28	134	72	
Do	Dec. 6-26	65	26	
Do	Dec. 27-Apr. 3	279	224	June 27, 1925-Mar. 20, 1926: Cases, 1,089; deaths, 580.
British East Africa:				
Kenya—				
Mombasa	Nov. 15-Dec. 19	14	6	
Do	Dec. 27-Mar. 20	2		
Tanganyika territory—				
Dar-es-Salaam	Feb. 21-27	1		
Uganda Protectorate	Sept. 1-Oct. 31	8	4	
British South Africa:				
Northern Rhodesia	Jan. 5-11	2		
Southern Rhodesia	Nov. 13-Dec. 23	3		
Canada				Sept. 13-Jan. 2: In 7 Provinces, 186 cases. Jan. 3-Feb. 27, 1926: Cases, 277.
Alberta				Jan. 3-May 1, 1926: Cases, 70.
Calgary	Dec. 13-19	1		From Drumheller, vicinity of Calgary.
British Columbia—				
Vancouver	Jan. 4-Mar. 27	2		
Victoria	Mar. 21-27	2		
Manitoba				Jan. 3-May 8, 1926: Cases, 78.
Winnepeg	Dec. 13-19	2		
Do	Jan. 3-Apr. 10	16	1	

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

Reports Received from December 26, 1925, to May 28, 1926—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Canada—Continued.				
New Brunswick—				
Northumberland	Dec. 6–13	1		
Ontario				Dec. 1–31, 1925: Cases, 32. Jan. 3–May 8, 1926: Cases, 269.
Admaston	Jan. 1–Feb. 1	16		Township.
Alice and Fraser	Feb. 1–28	6		Do.
King	do	7		Do.
Wilmot	do	6		Do.
Belleville	do	4		
Kingston	Mar. 8–14	1		
Kitchener	do	26		
North Bay	Feb. 14–Mar. 14	7		
Ottawa	Dec. 6–12	2		
Do	Jan. 3–Feb. 6	2		
Sarnia	Mar. 14–May 8	9		
Toronto	Dec. 27–Jan. 2	1		
Do	Jan. 3–May 1	28		
Trenton	Jan. 3–Apr. 17	15		
Saskatchewan				Jan. 3–May 8, 1926: Cases, 131.
Moose Jaw	Jan. 3–Mar. 20	2		
Regina	Jan. 24–May 1	5		
Saskatoon	Feb. 14–20	1		
Ceylon:				
Colombo	Dec. 6–12	1		Port case.
Do	Jan. 3–Feb. 6	5		
Chile:				
Punta Arenas	Dec. 13–26		8	
Do	Dec. 27–Jan. 2		4	
China:				
Amoy	Oct. 25–Dec. 19		1	
Do	Jan. 10–Apr. 3		26	
Antung	Dec. 7–20	2		
Do	Mar. 21–Apr. 4	1		
Changsha	Feb. 21–27			Present.
Chungking	Nov. 15–27			Do.
Do	Feb. 28–Apr. 3			Do.
Foochow	Nov. 1–Apr. 10			Do.
Hankow	Nov. 14–Dec. 26	4		
Do	Jan. 10–Mar. 6	3		
Hongkong	Nov. 22–Dec. 26	4		
Do	Jan. 3–Apr. 3	17	5	
Manchuria—				
An-shan	Dec. 6–12	1		
Do	Jan. 10–Mar. 20	9		
Changchun	do	21		
Dairen	Oct. 19–Dec. 27	73	15	
Do	Dec. 28–Apr. 4	87	28	
Fushun	Jan. 17–Mar. 31	3		
Harbin	Jan. 1–Apr. 15	18		
Kai-yuan	Jan. 10–30	4		
Kungchuling	Jan. 31–Feb. 20	2		
Lio-yang	Jan. 17–Mar. 30	5		
Mukden	Oct. 24–Nov. 15	1		
Do	Jan. 24–Feb. 27	4		
Suping Kai	Mar. 14–Apr. 3	2		
Tieh-ling	Oct. 26–Nov. 15	2		
Nanking	Nov. 21–Dec. 26			Do.
Do	Dec. 27–Apr. 10			Do.
Shanghai	Oct. 25–Jan. 2	37	36	
Do	Jan. 3–Apr. 3	57	134	Cases, foreign only.
Swatow	Nov. 22–Apr. 10			Prevalent.
Tientsin	Nov. 1–Dec. 19	2		
Do	Jan. 23–Feb. 27	2		
Chosen:				
Seishin	Jan. 1–Mar. 31	58	33	
Egypt:				
Alexandria	Dec. 3–31	5	2	
Do	Jan. 8–14	2	1	
Do	Jan. 29–Apr. 8	63	11	
Cairo	Dec. 25–31	14		
Do	Jan. 1–7	3		
Port Said	Feb. 26–Mar. 4	1		
Esthonia				November, 1925: Cases, 3.

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

Reports Received from December 26, 1925, to May 28, 1926—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
France				September-December, 1925: Cases, 253.
Do	Jan. 1-31	57		
Havre	Jan. 25-31		9	
Paris	Mar. 1-31	10	2	
Gold Coast	September, December.	58	5	
Do	Jan. 1-31	36	3	
Great Britain:				
England and Wales				Nov. 15-Dec. 26, 1925: Cases, 790; Dec. 27-Apr. 24, 1926: Cases, 4, 144.
Hull	Dec. 27-Jan. 23	29		
Do	Feb. 7-Mar. 27	9		
Leeds	Jan. 14-Feb. 6	4		
London	Jan. 31-Feb. 6		1	
Newcastle-on-Tyne	Nov. 29-Dec. 19	6		
Do	Dec. 27-Apr. 10	40	1	
Nottingham	Nov. 22-Dec. 26	9		
Do	Dec. 27-Mar. 13	6		
Sheffield	Nov. 22-Dec. 12	7		
Do	Dec. 20-26	3		
Do	Dec. 27-Mar. 20	18		
South Shields	Feb. 9			Reported present in severe form.
Greece				Oct. 1-31, 1925: Cases, 16.
Athens	Nov. 1-Dec. 31	18	1	
Do	Jan. 1-Mar. 31	87	6	
Kalamata	Mar. 1-7	1		From Patras.
Saloniki	Feb. 16-Mar. 15		2	
Guadeloupe (West Indies)				Apr. 23-May 10, 1926: Present. Alastrim.
India				Oct. 18-Dec. 26, 1925: Cases, 19,472; deaths 4,440. Dec. 27, 1925-Mar. 20, 1926: Cases, 77,893; deaths, 20,629.
Bombay	Nov. 8-Dec. 26	26	20	
Do	Dec. 27-Apr. 3	292	151	
Calcutta	Nov. 8-Dec. 26	48	25	
Do	Dec. 27-Apr. 3	620	397	
Karachi	Nov. 1-21	23		
Do	Nov. 29-Dec. 5	4	2	
Do	Dec. 13-19	3		
Do	Dec. 29-Apr. 17	113	36	
Madras	Nov. 15-Dec. 26	17	5	
Do	Dec. 27-Apr. 17	143	25	
Rangoon	Oct. 25-Dec. 26	7	1	
Do	Dec. 27-Jan. 16	13	1	
Do	Jan. 24-Mar. 6	70	17	
Do	Mar. 21-Apr. 10	28	7	
Indo-China				September-November, 1925: Cases, 346; deaths, 86.
Province—				
Annam	Sept. 1-Dec. 31	232	44	
Cambodia	do	84	34	
Cochin China	do	106	51	
Saigon	Dec. 21-27	2	1	
Do	Jan. 1-Mar. 28	14	2	Including 100 square kilometers of surrounding country.
Tonkin	Sept. 1-Dec. 31	153	2	
Iraq:				
Bagdad	Nov. 1-Dec. 26	19	15	Sept. 6-Oct. 17, 1925: Cases, 61; deaths, 40.
Do	Dec. 27-Mar. 13	29	11	
Basra	do	52	42	
Italy				Aug. 2, 1925-Jan. 2, 1926: Cases, 52. Jan. 3-Feb. 20, 1926: Cases, 26.
Catania	Feb. 15-28	7	1	
Genoa	Jan. 21-Feb. 10	4		
Rome	Oct. 12-25	1		
Do	Feb. 22-28	1		Ocurring in consular district.
Jamaica				Nov. 29-Dec. 26, 1925: Cases, 95. Dec. 27, 1925-Apr. 24, 1926: Cases, 509. Reported as alastrim.
Kingston	Nov. 29-Dec. 26	43		Reported as alastrim.
Do	Dec. 27-Jan. 30	48		Do.
Do	Feb. 28-Apr. 24	36		Do.
Japan:				
Kobe	Mar. 14-Apr. 17	3		
Nagasaki	Feb. 15-25	2		
Taiwan	Nov. 11-Dec. 10	3		
Do	Mar. 21-31	3		
Yokohama	Dec. 14-20	1		
Do	Feb. 23-Apr. 10	67	11	

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

Reports Received from December 26, 1925, to May 28, 1926—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Java:				
Batavia	Oct. 24–Dec. 25	8		
Do	Feb. 20–Mar. 19	6		
Buitenzorg	Nov. 29–Dec. 5	1		
Cheribon	Nov. 8–Dec. 12	2		
Do	Jan. 31–Feb. 6		1	
Kraksaan	Oct. 11–17	11		
Malang	Oct. 11–Dec. 26	2		
Do	Dec. 27–Jan. 16	3	2	
North Bantam	Oct. 4–17	4		
Pekalongan	Oct. 25–31	1		
Pontianak	Jan. 31–Feb. 6		1	
Probolinggo	Oct. 11–17	1		
Serang	Feb. 14–27	5		
South Bantam	Feb. 23–Mar. 27	1		
Surabaya	Oct. 11–Dec. 26	633	104	
Do	Dec. 27–Mar. 13	141	43	
Tegal	Oct. 4–10	9	1	
Latvia				December, 1926: Cases, 3.
Malta	Nov. 1–Dec. 21	21	3	
Do	Jan. 1–Feb. 28	20		
Martinique	May 10			Prevalent.
Mexico				July–September, 1925: Deaths, 1,157.
Aguascalientes	Dec. 13–Jan. 2	4	3	
Do	Jan. 3–30		7	
Do	Feb. 14–May 8		4	
Durango	Dec. 1–31		1	
Do	Jan. 1–31		2	
Guadalajara	Dec. 27–May 10		25	
Mexico City	Nov. 28–Dec. 5	1		Including municipalities in Federal District.
Do	Jan. 3–Apr. 24	11		Do.
Saltillo	Apr. 4–10	1		
San Luis Potosi	Jan. 17–Mar. 20		53	
Do	Mar. 28–May 8	15	25	
Tampico	Dec. 21–Jan. 2	1	1	
Do	Jan. 2–Mar. 10	8		
Torreon	Nov. 1–Dec. 31		51	
Do	Jan. 1–Mar. 31		65	
Vera Cruz	Mar. 29–Apr. 4	5	1	
Netherlands:				
The Hague	Jan. 30–Mar. 6	2	1	
Nigeria				Aug. 1–Dec. 31, 1925: Cases, 380; deaths, 6.
Do	Jan. 1–31	135	1	
Palestine:				
Hebron	Jan. 26–Feb. 1	2		
Tiberias	Feb. 9–15	1		
Persia:				
Teheran	July 23–Dec. 22		775	
Do	Dec. 23–Feb. 19		99	
Peru:				
Arequipa	Oct. 1–Dec. 31		2	
Poland				Nov. 1–28, 1925: Cases, 9. Jan. 1–16, 1926: Cases, 4. Mar. 1–28, 1926: Deaths, 6.
Portugal				
Lisbon	Oct. 4–31	124		
Do	Nov. 16–Dec. 27		60	
Do	Nov. 14–Dec. 26	187		
Do	Dec. 27–Apr. 25	126	32	
Oporto	Nov. 22–Dec. 19	2	3	
Do	Dec. 27–Apr. 24	4	1	
Rumania	August–October	3		
Russia				May–June, 1925: Cases, 2,333.
Do	July–October	1,563		July 1–Dec. 31, 1925: Cases, 3,447.
Siam				July 12–Sept. 5, 1925: Cases, 21; deaths, 6.
Bangkok	Dec. 20–25	3	1	
Do	Dec. 26–Mar. 6	81	37	
Do	Mar. 14–Apr. 3	21	13	
Sierra Leone:				
Konno district	Dec. 16–31	5		
Spain:				
Madrid	Year 1925		18	
Do	Jan. 1–31		1	
Malaga	Nov. 29–Dec. 5		2	
Do	Dec. 27–Jan. 2		1	

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

Reports Received from December 26, 1925, to May 28, 1926—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Spain—Continued.				
Valencia	Dec. 20–26	1		
Do	Dec. 27–Jan. 2	1		
Do	Jan. 10–Feb. 6	9		
Do	Feb. 14–Apr. 24	12		
Straits Settlements:				
Penang	Mar. 28–Apr. 3		1	
Singapore	Dec. 20–26	1		
Do	Jan. 10–Mar. 27	8	2	
Sumatra:				
Medan	Feb. 14–27	2		
Switzerland				June 28–Nov. 21, 1925: Cases, 62. Dec. 27, 1925–Feb. 27, 1926. Cases, 48.
Lucerne	Oct. 1–Nov. 30	8		
Do	Jan. 1–31	5		
Zurich	Dec. 27–Jan. 2	1		
Trinidad (West Indies):				
Port of Spain	Jan. 1–Apr. 3	12		
Tripolitania	July 1–Dec. 31	34		
Do	Jan. 1–31	3		
Tunisia:				
Tunis	Nov. 21–30	2		
Do	Dec. 11–31	10	1	
Do	Jan. 1–Apr. 20	7		
Turkey:				
Constantinople	Mar. 9–23	2	3	
Union of South Africa:				
Cape Province	Jan. 17–23			Outbreaks.
Orange Free State—				
Kuruman district	Jan. 10–16			Do.
Ladybrand district	Dec. 27–Jan. 2			Do.
Transvaal—				
Belfast district	do			Do.
Germiston district	Jan. 2–9			Do.
Pretoria district	Dec. 6–12			Outbreaks. In native compounds.
On vessel	Feb. 21	2		Mexican steamer Montezuma, at Port of Ensenada, Mexico.

TYPHUS FEVER

Algeria:				
Algiers	Nov. 1–Dec. 20	2		
Do	Jan. 1–Apr. 10	13		
Argentina:				
Rosario	Oct. 13–Dec. 31	2		
Bulgaria	Sept. 1–Dec. 31	50	3	
Do	Jan. 1–31	42		
Sofia	Dec. 25–31	1		
Do	Jan. 8–14	2		
Canary Islands:				
Santa Cruz de Teneriffe	Mar. 8–14	1		
Chile				Dec. 15–31, 1925: Cases, 46. Jan. 1–15, 1926: Cases, 23.
Achao	Dec. 15–31	1		
Do	Jan. 1–15	1		
Ancud	do	2		
Antofagasta	Apr. 11–17	1		
Bulnes	Dec. 15–31	1		
Chillan	do	24		
Concepcion	do	6		
Linares	do	1		
Los Angeles	do	5		
Penco	do	2		
Salamanca	do	17		
San Carlos	do	1		
Talca	do	1		
Valparaiso	Nov. 29–Jan. 2	5	2	
Do	Jan. 3–Mar. 27	4		
China:				
Antung	Nov. 29–Dec. 27	5	1	
Do	Jan. 4–Apr. 11	15		
Hongkong	Dec. 27–Jan. 2	1		
Manchuria—				
Harbin	Dec. 17–Feb. 4	3		
Do	Apr. 2–8	1		
Shanghai	Mar. 14–20	1		

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

Reports Received from December 26, 1925, to May 28, 1926—Continued

TYPHUS FEVER—Continued

Place	Date	Cases	Deaths	Remarks
Czechoslovakia	October-December	146	1	
Do	Jan. 1-31	32		
Egypt:				
Alexandria	Jan. 8-Feb. 25	2		
Cairo	Nov. 5-Dec. 16	3	2	
Port Said	Nov. 19-25	1		
Do	Mar. 12-18	1		
Esthonia	Jan. 1-31	6		
Finland				October, 1925: 1 case.
France	July-October	4		
Greece				December, 1925: Cases, 12.
Athens	Nov. 1-30	11	2	
Do	Jan. 1-Mar. 31	45	9	
Saloniki	Dec. 29-Jan. 4	1		
Do	Feb. 2-Mar. 22	2		
Hungary				November-December, 1925: Cases, 16. Jan. 1-31, 1926: Cases, 6.
Ireland:				
Cork County—				
Cork	Dec. 26-Jan. 1	2		
Do	Jan. 2-8	5		
Dumanway	Nov. 14	1		
Galway County	Oct. 17	1		
Kerry County—				
Listowel	Mar. 7-13	1		Rural district.
Wexford County—				
Gorey	do	1		Do.
Latvia	October-December	12		
Riga	Oct. 1-31	2		
Lithuania				September-December, 1925: Cases, 26; deaths, 1. Jan. 1-31, 1926: Cases, 16; deaths, 1.
Mexico				July-September, 1925: Deaths, 90.
Aguascalientes	Dec. 14-19	1		
Durango	Dec. 1-31		1	
Do	Jan. 1-31		1	
Guadalajara	Dec. 8-28		2	
Do	Dec. 29-Jan. 4		1	
Mexico City	Nov. 22-Dec. 26	50		Including municipalities in Federal District.
Do	Dec. 27-Mar. 20	89		Do.
Do	Mar. 28-Apr. 10	11		Do.
San Luis Potosi	Feb. 6-13		1	
Tampico	Dec. 21-Jan. 10	1	1	
Torreon	November, 1925		1	
Vera Cruz	Feb. 12		1	
Morocco	August-December	93		
Do	Jan. 1-31	57		
Norway				November-December, 1925: Cases, 2.
Palestine:				
Ekron	Mar. 30-Apr. 5	1		
Gaza	Dec. 18	1		
Haifa	Mar. 16-Apr. 19	2		
Jaffa	Dec. 1-7	1		
Do	Feb. 23-Mar. 1	1		
Nazareth	Nov. 3-9	1		
Ramleh	Mar. 16-22	1		
Safad	Nov. 24-30	1		
Tel-Aviv	do	1		
Do	Mar. 9-15	1		
Tiberias	do	2		
Peru:				
Arequipa	October-December		3	
Do	Feb. 1-Mar. 31		2	
Poland	Oct. 11-Jan. 2	462	44	
Do	Jan. 3-Feb. 13	611	45	
Rumania				July 1-Dec. 31, 1925: Cases, 348; deaths, 41.
Constantza	Feb. 1-Mar. 10	2		
Russia				May-June, 1925: Cases, 10,680.
Do				July 1-Nov. 30, 1925: Cases, 7,980.
Tunisia:				
Tunis	Mar. 21-31	3		
Turkey:				
Constantinople	Jan. 24-30	3		
Do	Feb. 9-Mar. 31	6	4	

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

Reports Received from December 26, 1925, to May 28, 1926—Continued

TYPHUS FEVER—Continued

Place	Date	Cases	Deaths	Remarks
Union of South Africa				October, 1925: Cases, 88; deaths, 7 (colored). Cases, European, 7. December, 1925: Cases, 78; deaths, 9. Colored: Cases, 73; deaths, 9 January–February, 1926: Cases, 163; deaths, 28. Colored.
Cape Province	Oct. 1–31	63	5	
Do	Nov. 8–Dec. 31	47	8	
Do	Jan. 1–Feb. 28	126	20	Do.
Grahamstown	Jan. 24–30	2		
Middleburg district	Dec. 6–12	1		European. On farm.
Natal	Oct. 1–Dec. 5	1		
Do	Jan. 1–Feb. 28	11	1	Colored.
Durban	Jan. 3–Apr. 3	6	1	
Orange Free State	Nov. 29–Dec. 5	23	1	
Do	Dec. 1–31	8	1	
Do	Jan. 1–Feb. 28	8	3	Do.
Bethulia district	Dec. 6–12			Outbreaks.
Bothaville district	do	1		Native. On farm.
Transvaal	Oct. 1–31	1	1	
Do	Dec. 1–31	18		
Do	Feb. 1–28	8	4	
Johannesburg district	Mar. 1–20	3		
Bloemhof district	Dec. 27–Jan. 2			Outbreak. On farm.
Yugoslavia				Jan. 1–Feb. 21, 1926: Cases, 81; deaths, 12.

YELLOW FEVER

Gold Coast	Sept. 1–Dec. 31	4	3	
Nigeria	August–October	3	2	
Senegal	November, 1925	3	2	