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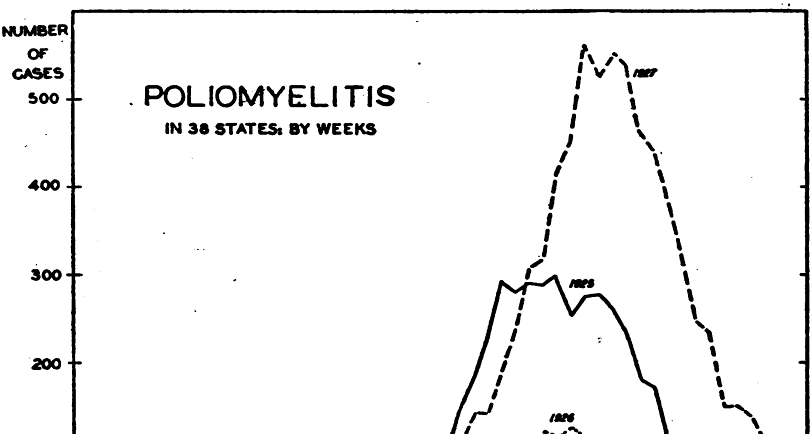
PREVALENCE OF POLIOMYELITIS IN THE UNITED STATES

During the winter and spring months of 1928 the prevalence of poliomyelitis was greater than usual, although the number of cases was not large. Since about the first of June the reports have shown fewer cases than last year, and the usual summer rise in the incidence of the disease began later than it did in 1927.



The reports from 43 States for six weeks of July and August, 1926, 1927, and 1928, are shown in the following table:

Week ended—	1928	Corresponding week— 1927	Corresponding week— 1926	Week ended—	1928	Corresponding week— 1927	Corresponding week— 1926
July 7, 1928	37	80	39	July 28, 1928	80	142	66
July 14, 1928	41	106	54	Aug. 4, 1928	178	197	64
July 21, 1928	61	146	49	Aug. 11, 1928	216	246	89

The increase this summer has not been uniform throughout the country. Some of the differences between the reports from certain States this year, for the latest week available, and last year are as follows:

State	Week ended—		State	Week ended—	
	Aug. 11, 1928	Aug. 13, 1927		Aug. 11, 1928	Aug. 13, 1927
Massachusetts	43	28	Oklahoma	1	11
New York	56	13	Texas	0	19
New Jersey	3	13	New Mexico	0	9
Pennsylvania	10	4	Washington	12	0
North Dakota	13	0	Oregon	5	1
Maryland	26	0	California	4	63

The accompanying graph shows the number of cases reported by 38 States for the years 1925 to 1928.

TRACHOMA STUDIES

I. THE ORIGIN AND NATURE OF THE VON PROWAZEK-HALBERSTAEDTER INCLUSION BODIES IN TRACHOMA

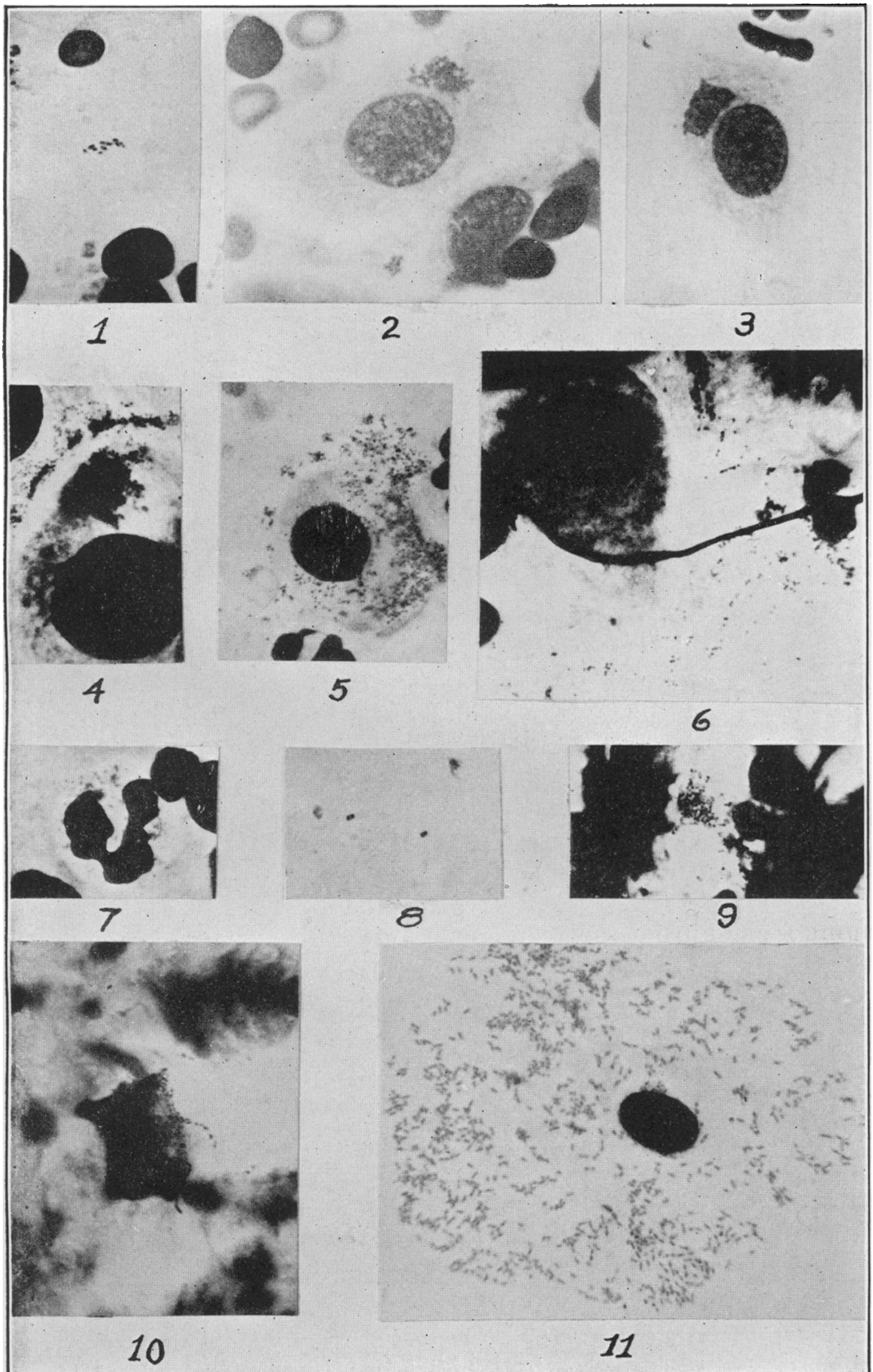
By IDA A. BENGTSON, *Bacteriologist, United States Public Health Service*[1]

A microscopical study of stained films of conjunctival material and sectioned preparations of conjunctivæ and tarsi from cases of trachoma has been carried on in connection with cultural studies undertaken with a view to throwing light on the etiology of the disease. All the patients from whom material was obtained were of the white race. Most of the patients came from the Ozark region of Missouri, though a number came from the reclaimed swamp area along the Mississippi River, in the southeastern part of the State, where the topography is in marked contrast to the hills of the Ozarks. The great majority had a family history of the disease.

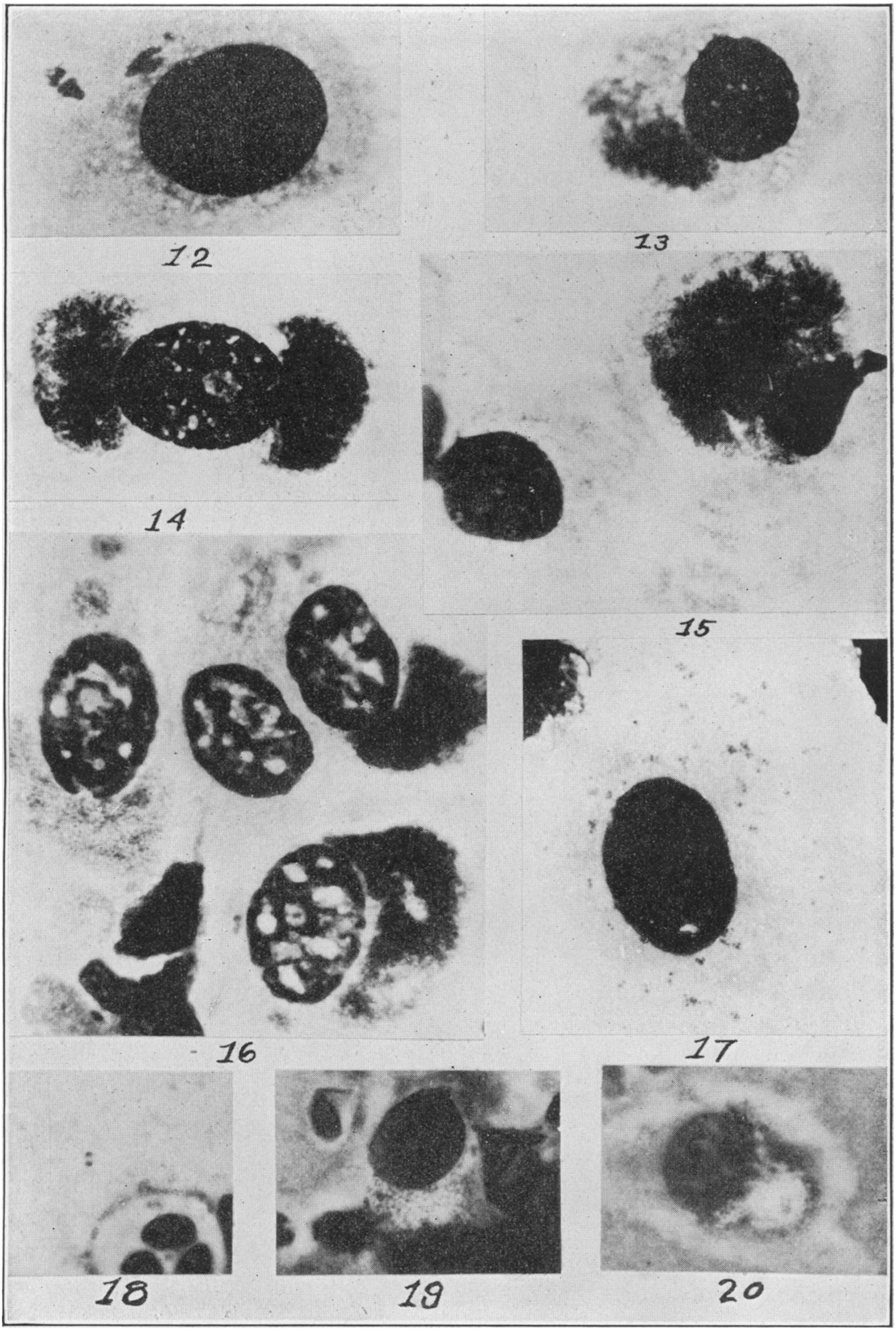
The clinical appearance of a large number of the cases was that of true trachoma, with follicle formation and hypertrophy and congestion of the palpebral conjunctiva. A high percentage (83 per cent) showed pannus formation, and a number had ulcers of the cornea. The more advanced cases showed the usual sequelæ, including trichiasis, entropion, and thickening and deformity of the tarsus. Film preparations for purposes of microscopic examination were obtained from only such cases as showed a condition of activity.

In the microscopic examination particular attention was paid to the von Prowazek-Halberstaedter epithelial cell inclusions, but the

[1] This work has been carried on in an extension of the Hygienic Laboratory temporarily established at Rolla, Mo., the quarters of which were furnished by the department of biology of the Missouri School of Mines and Metallurgy. The material was obtained from patients received at the United States Trachoma Hospital located in Rolla.



(Explanation on page opposite)



(12) Early stage of inclusion body showing lamellar structure. (13–16) Inclusion bodies showing "mantle" and "elementary bodies." (17) Small coccoid forms occurring in pairs in cytoplasm of epithelial cell. (18) "Free Lindner initial body." (19, 20) Inclusion bodies with wet fixation method

Approximately × 1,000. Giemsa stain. Photographs by M. K. Underwood presence of definite bacteria and other bodies which might have a bearing on the subject was also noted. The question as to the etiological significance of the epithelial cell inclusions is still unanswered. The search for these bodies is often a tedious process, and at times they are not to be found in typical cases of the disease. Their presence in a certain number of cases, however, challenges investigation. Much work has already been done along this line and a number of theories have been proposed as to their origin and nature. Some still hold to the view that they are products of cellular disintegration (Lumbroso and Trapezontzewa). Wolbach and McKee consider them to be the product of mucous secretion under pathological conditions. Noguchi and Williams have considered them to be parasitic organisms, bacterial in nature. Others consider them to be foreign parasitic organisms contained within the cytoplasm of the epithelial cell, but nonbacterial in nature (von Prowazek and Lindner).

The first two theories appear untenable, for the reason that the inclusion bodies at certain stages show a definite structure such as could result only from the *growth* of a living organism. This will be brought out more at length in the following discussion. The question to be answered is whether the bodies are bacterial in nature or whether they occur as the result of the growth of some organism nonbacterial in character, such as protozoa or some form which is neither bacterial nor protozoan, in short whether the term *Chlamydozoa* (mantle animals) used by von Prowazek is justifiable.

The inclusion bodies are peculiar in structure and exhibit a marked variation in appearance which, to a great extent, accounts for the difficulty in determining their true nature. The original description of Halberstaedter and von Prowazek still holds for the most part: "In den nach Giemsa gefärbten Präparaten waren innerhalb des Epithelzellen neben dem Kern in dem lichtblauen Protoplasma dunkelblau färbbare, nicht homogene, unregelmässige Einschlüsse sichtbar (zuerst von Prowazek konstatiert). Die zunächst kleinen runden oder ovalen Einlagerungen werden allmählich grösser, nehmen eine maulbeerförmige Gestalt an und erfahren eine mit fortschreitendem Wachstum zunehmende Auflockerung, die im Zentrum beginnt. In der Folge sitzen sie meist kappenförmig dem Kern auf. Sodann tauchen innerhalb dieser Einschlüsse rot färbbare, distinkte, sehr feine Körperchen auf, die sich rapide vermehren, die blau gefärbten Massen allmählich zum Verschwinden bringen. Schliesslich nehmen sie den grössten Teil des Protoplasmas ein, während die blau gefärbten Substanzen nur noch als kleine Inseln zwischen ihnen nachweisbar sind. In den Ausstrichpräparaten kann man auch feine Körperchen neben den Zellen beobachten."

If it is granted that the inclusion body is viable, and there is taken into consideration the fact that the inclusion body varies in size and that similar bodies do not occur outside the epithelial cells, then it may be assumed that the inclusion body originates from a small body which has gained access to the cytoplasm of the cell and has there grown or multiplied. The logical procedure for determining the morphology of the organism from which the inclusion body originates would be to make a comparative study of numerous preparations showing the inclusion body in as many different stages as possible and particularly the early stages, and this is the plan which has been followed. Records by micrometer readings of the mechanical stage have been made of numerous fields showing inclusion bodies, so that these fields could be relocated for purposes of comparison and for refreshing the memory in regard to their appearance.

The study has involved the examination of film preparations from 230 cases of conjunctival affections diagnosed as trachoma received at the United States Trachoma Hospital at Rolla, Mo. The diagnoses have been made by Acting Asst. Surg. Robert Sory and Asst. Surg. W. C. Plumlee, medical officers in charge of the hospital, and Surg. P. D. Mossman, medical officer in charge, Trachoma Prevention, United States Public Health Service. In addition to the conjunctival material, sections of tarsi and conjunctivæ removed in two tarsectomy operations performed by Dr. John Green, St. Louis, Mo., and sections of several excised follicles and portions of tarsi removed in 15 entropion operations, have been examined. Inclusion bodies were found in 45 per cent of the cases studied. Giemsa stain has been employed in most of the work, though Lindner's contrast stain has been used to some extent. The majority of films have been treated according to the usual method of dry fixation; a few were treated according to Lindner's method of wet fixation. For the sectioning of the material from the entropion and tarsectomy operations, I am indebted to the Eye Research Bureau, maintained by the Missouri Association for the Blind and the St. Louis University Medical School, arranged through Dr. Harvey D. Lamb, of St. Louis, Mo.

The various stages of the inclusion body as interpreted by the microscopic findings in film preparations may be described as follows:

(1) The final stage is that in which minute reddish or violet staining forms (Giemsa stain), which appear to be very small cocci, often in pairs, are found emerging from the cytoplasm of the epithelial cell,

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EXPLANATION OF PLATE I

(1) Group of rods occurring free. Variation in length and occurrence of several pairs one of which resembles a diplococcus to be noted. (2) Early stage of 2 inclusion bodies showing rod structure. (3) Somewhat later stage of inclusion body showing lamellar structure. (4) Inclusion body composed of dense mass of organisms of which it is not possible to determine the structure, except in the case of several organisms at the right of the inclusion body. Shows also portions of "mantle" and some small coccus forms ("elementary bodies" of von Prowazek). (5) Small cocci in epithelial cell with trace of "mantle." (6) Small free cocci. Tendency to occur in pairs to be noted. (7) Small cocci in leucocyte. (8) Bipolarly stained short form resembling diplococcus ("free Lindner initial body"). (9) Group of rods and bipolarly stained organisms ("Lindner initial bodies") in sectioned conjunctival tissue. (10) Dense mass of rods, some showing bipolar staining, in sectioned conjunctival tissue. (11) Rods surrounding nucleus of epithelial cell. Tendency to diploid formation and presence of some very short forms to be noted.

Approximately × 1,000. Giemsa stain. Photographs by M. K. Underwood.

or lying free outside the cell. ((6) Pl. I, (15) Pl. II.) When seen at this stage these small bodies are often indefinite, but at times they are very definite in form and outline and stain uniformly. In morphology, grouping, and staining properties they resemble very small cocci, though at times they may appear slightly elongated. These small bodies have been variously spoken of as points, granules, etc., and the statement has been made that the inclusion body "breaks up" or disintegrates, into the small bodies, giving the impression that they are irregular in form when, as a matter of fact, they are quite uniform in size. The small coccus forms have, in a few cases, been found lying free in fields considerably removed from any epithelial cell, and they have also been found in the leucocytes. ((7) Pl. I.)

(2) The stage preceding the final stage is that in which the small reddish or violet staining cocci lie embedded in a blue staining matrix or "mantle," in the cytoplasm of the epithelial cell. Owing to the presence of the "mantle," the small cocci appear much less distinct and more indefinite in outline than when occurring free outside the cells. ((4) (5) Pl. I, (13), (14), (15), (16) Pl. II.) Seen at this stage they were designated by von Prowazek as "elementary bodies." The "mantle" varies in density, the small coccoid bodies showing through with more or less distinctness.

(3) The stage preceding the "mantle" stage is that in which the inclusion body appears as a dense, deeply staining blue or purplish mass (Giemsa stain), which may show no structure ((4) Pl. I) or which may be described as coarsely granular or lamellar in structure ((3) Pl. I, (12) Pl. II). In this stage as in the stage preceding, the mass may be adjacent to the nucleus and crescentic ((14), (15), (16) Pl. II), but it is not necessarily so ((3) Pl. I, (12) Pl. II).

(4) In a still earlier stage the inclusion body is less dense and the structure may be more easily distinguished. It may occasionally show very definite rodlike or diphtheroidal structure. ((2) Pl. I.) The individual organisms may at times be seen very distinctly. More often, however, the picture is not so clear and the individual organisms appear indefinitely outlined. In spite of this, however, the rodlike structure may often be seen. Very short diplobacilliform organisms, scarcely distinguishable from diplococci, have been found. ((2) Pl. I.) The latter probably correspond to Lindner's "initial bodies." In a few cases a single rod, apparently in the cytoplasm of the cell and adjacent to the nucleus, has been seen.

(5) In many specimens, rod-shaped bacteria, though few in number, may be found free outside the cells. ((1) Pl. I.) After examining a large number of slides one becomes impressed with the fact that if any organisms whatever are found they are practically always rod-shaped in form, often occurring in pairs. The outer ends of the pairs at times show a tendency to be pointed, though there are gradations

between these which show quite rounded ends. The length of the organism is also variable. Some of the diploid forms are so short that they present the appearance of a diplococcus. ((1) Pl. I.) The distinguishing characteristics of the organism, however, are its definite rod form and its tendency to occur in pairs.

Considering the stages of the inclusion body described, the fact that the inclusion body in all probability must originate from some organism entering the cytoplasm from without, the presence of rod-shaped microorganisms outside the cells, and the rodlike structure of the early stages of the inclusion body, one is led to the conclusion that it is a rod-shaped organism which enters the cell, multiplies therein, and forms the inclusion body.

The process of development of the inclusion body is probably as follows: After the entrance of the rod-shaped organism into the cytoplasm of the epithelial cell, it begins to multiply. The protoplasm of the cell offers a certain resistance, which is probably mechanical, in consequence of which the organisms are prevented from spreading out into the cell and grow into a densely packed mass of which it is difficult to determine the structure. After multiplication has progressed to a certain stage, apparently a reaction on the part of the protoplasm against the invading organism takes place. The mass which stained a deep blue with Giemsa stain, indicating viability, now becomes more diffuse, staining a lighter blue, forming the "mantle." There appear small reddish staining coccoid forms, the "elementary bodies" of von Prowazek scattered throughout the "mantle." The interesting question in this connection is what is responsible for the transformation which takes place in the inclusion body. In answering this question it must be taken into consideration that the epithelial cell is in all probability a viable cell and as such it reacts against the foreign invading body. This is probably accomplished by means of some substance which has a tendency to dissolve the foreign body. The action of the lytic substance on the mass of bacteria transforms it into the peculiar body we see, the blue staining "mantle" probably representing the dissolved portion of the bacteria, or possibly this together with some of the lytic substance itself, and the "elementary bodies" the residue of the bacteria. This matter will be considered more at length in the following paper.

The reddish staining coccoid forms, though differing in appearance to such an extent from the rods, nevertheless show evidence of having originated from them, in that they frequently occur in pairs, as is true also of the rods, as previously stated. The occurrence of these coccoid forms in definite pairs ((6) Pl. I, (17) Pl. II) is, perhaps, the best evidence that the inclusion bodies are parasitic in character and are formed as the result of the multiplication of a living organism. The formation of precipitate in the cytoplasm of the cell, through material extruded from the nucelus or through cytoplasmic disintegration, or through mucous secretion, would not show this definite structure.

Whether these small forms are viable is a question. If intensity of staining reaction is a criterion, it would appear at times that they possibly are. When occurring in the cytoplasm of the cell, they become more and more distinct as the "mantle" fades, and they are sometimes quite deeply stained. They emerge from the cell, and when found in the neighborhood of the cell they may also be stained rather intensely, appearing reddish violet in color. When found at a distance from the epithelial cells they are usually more faintly stained and, on account of their small size and indefinite staining, are difficult to distinguish. They have been found in the leucocytes distinct enough in outline and staining reaction to be easily distinguishable, though more often bodies have been seen in the leucocytes which are only suggestive of the small coccoid forms on account of their faint staining and indefinite outline.[2]

In sections of specimens of conjunctiva from trachoma cases, groups of rod forms, sometimes in dense masses, have been found to occur. ((10) Pl. I.) These stain blue with Giemsa stain and at times may be distinguished only with difficulty. They show the same tendency to occur in pairs as do the organisms found in film preparations of the conjunctiva.

In the groups of rodlike organisms in sectioned material evidence has been found of the origin of the Lindner "free initial bodies," the peculiar cylindrical or oval forms stained at the rim and bipolarly, which are the most puzzling of any of the forms found in trachomatous material. ((8) Pl. I, (18) Pl. II.) Though not occurring frequently in film preparations from the conjunctiva, they have been found very much in evidence in a few specimens and have been seen occasionally in a number of others. In the sectioned specimens referred to these bipolarly staining forms have been found in the groups of rod forms and so closely associated with them that there seems little doubt that they are different forms of the same organism. The size and morphology of these bodies when seen free in film preparations are quite variable. Some give the appearance of

[2] Additional evidence of the origin of the inclusion bodies from rod-shaped organisms was shown in a chance finding in a specimen of blood collected from the scarified conjunctiva of a trachoma patient for the purpose of making a white-cell count. The specimen was collected with the diluting fluid containing acetic acid and allowed to stand for several hours. As it was found unsuitable for the purpose for which it was collected, a film of the material was made on a slide, and it was fixed with methyl alcohol and stained with Giemsa stain in the usual way. In the specimen was found the nucleus of an epithelial cell surrounded by a large number of rod-shaped bacteria, many in pairs. The appearance was as though the diluting fluid had dissolved the cytoplasm of the cell, allowing the organisms, which may have been present as one mass or several densely packed masses of organisms forming inclusion bodies, to be dispersed, so that their morphology was plainly evident. Attention is called to the considerable amount of pleomorphism found. ((11) Pl. I.) Several other similar cells were found in the same preparation, but none as distinct as the one reproduced.

having developed from a diplococcal form such as the short diplobacilli at times exhibit. ((1) Pl. I.) Lindner calls attention to the fact that they have been taken for gonococci. Others are elongated and show the marginal and bipolar staining with clear center. Occasionally a "free initial body" has been seen closely associated with the small coccus forms outside the cell. It is probable that these forms also are due to the action of certain lytic substances in the conjunctiva which act on them to transform them into the unusual forms.

SUMMARY AND COMMENT

The microscopic evidence in a study of film preparations and sections of conjunctivæ and tarsi from cases of trachoma is that the inclusion bodies in the epithelial cells originate from rod-shaped microorganisms which tend to occur as diplobacilli, and that the development of the inclusion body after the entrance of the rod into the cytoplasm of the cell is due to the multiplication of the organism and subsequent reaction on the part of the cell against the invading bacteria, transforming them into the small reddish staining coccoid forms designated by von Prowazek as "elementary bodies" with the blue staining "mantle" which represents the partially dissolved portion of the bacteria. The "free Lindner initial bodies" appear to be pleomorphic or modified forms of rod-shaped bacteria which have been seen rather infrequently outside the cells and which occur as blue stained oval or cylindrical bodies stained at the rim and bipolarly. These are probably also formed as the result of the action of conjunctival fluids on the rod-shaped microorganisms. In interpreting the inclusion body, the "elementary bodies," and "free initial bodies," the fact must be borne in mind that they are found in the conjunctiva which, on account of its exposure, is particularly liable to the invasion of microorganisms and must, therefore, be unusually rich in protective substances which are probably lytic in action. These act on the bacteria to destroy or inhibit their growth, and it is not surprising that the latter should be changed into forms which are quite unrecognizable when compared with those occurring in artificial culture media containing none of these substances antagonistic to their growth.

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II. THE EXPERIMENTAL PRODUCTION IN LABORATORY ANIMALS OF FORMS RESEMBLING THE "ELEMENTARY BODIES" OF VON PROWAZEK AND THE "INITIAL BODIES" OF LINDNER

By IDA A. BENGTSON, *Bacteriologist, United States Public Health Service*

After the completion of the work reported in the preceding paper, and following the announcement of Noguchi that he had succeeded in producing a granular conjunctivitis resembling trachoma in *rhesus* monkeys as the result of the inoculation of a certain gram-negative rod-shaped microorganism isolated from human cases of trachoma, attempts were made to isolate an organism corresponding to the one described by Noguchi. In addition to the inoculation of cultures into monkeys in an effort to produce the disease, inoculations of cultures were also made into other laboratory animals for the purpose of determining the effect of their presence on the conjunctiva, or of growth in the conjunctival tissues, on the morphology of the organism. It was desired to know whether forms corresponding to the inclusion bodies in the epithelial cells, the "elementary bodies" and Lindner "initial bodies," would develop.

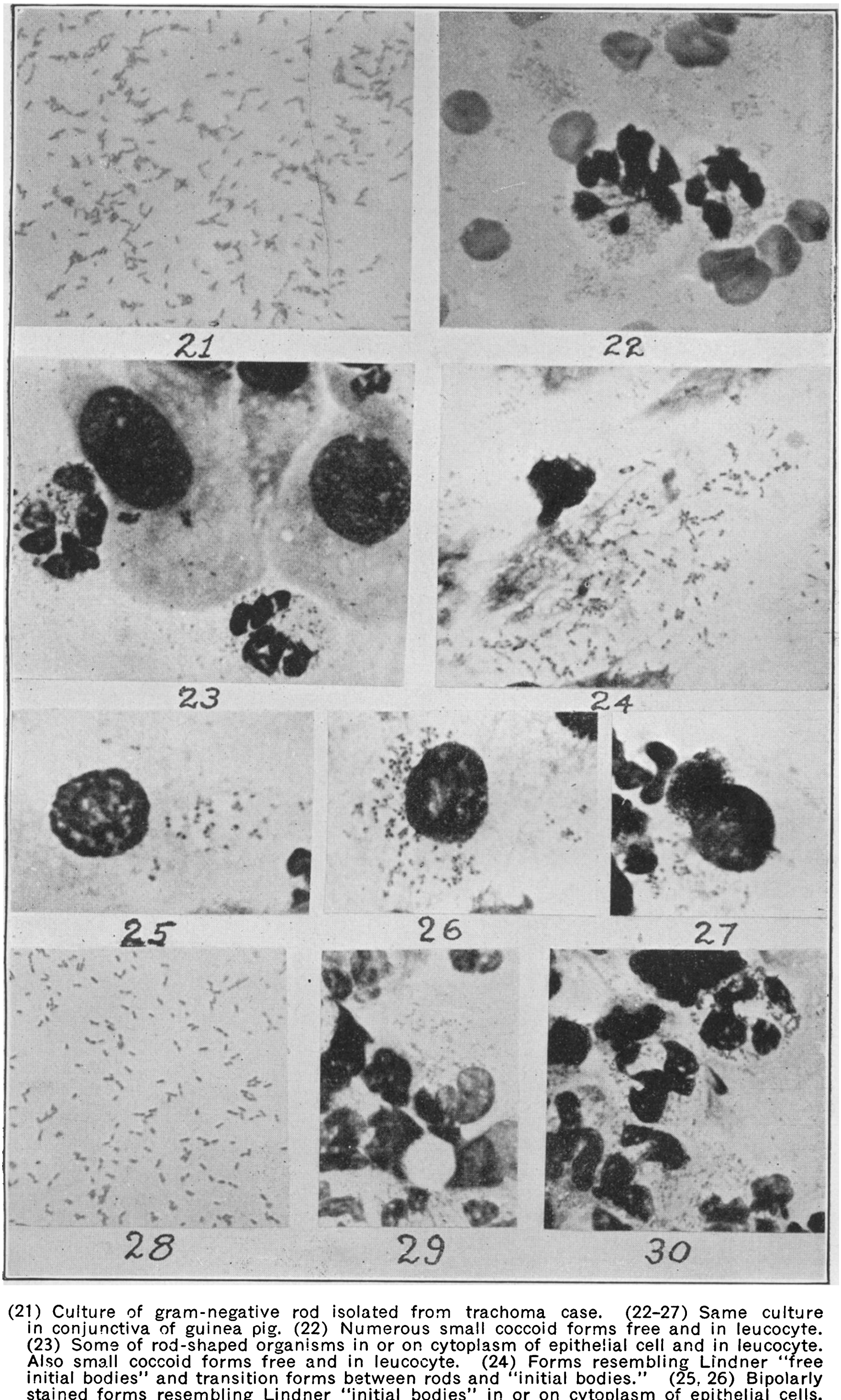
In a study of trachoma, the ultimate desideratum would be to produce the disease in monkeys or other laboratory animals and, at the same time, to show the presence of the inclusion bodies and the other forms described in the conjunctiva of such animals (postulating that these forms are concerned in the etiology of the disease, of which we are not certain). However, it is undesirable to disturb the possible development of the disease in monkeys after the inoculation, by removing material for film preparations, and it is probably true that, even after the disease had developed, a great many preparations from a considerable number of monkeys would have to be examined in order to determine whether these bodies were present, judging from the difficulty with which they are found in human cases.

Small laboratory animals offer the advantage that many may be used and film preparations may be made as frequently as desired at various stages. Rabbits were found not suitable, for the reason that practically all rabbits show the presence of numerous faintly stained irregular rods. The conjunctiva of guinea pigs, on the other hand, appears to be almost free of bacteria, microscopically speaking. The guinea pig, therefore, appeared to be more favorable than rabbits for performing the tests.

Several different cultures of gram-negative rods isolated from the conjunctiva of trachoma patients were inoculated at various times into the conjunctiva of a number of guinea pigs and film perparations made a short time after the inoculations, sometimes within a few hours, and for several days after the inoculations. The preparations were fixed and stained as usual with Giemsa stain. The preparations for microscopic examination were made early, for the reason that the organisms are most numerous shortly after inoculation and the chances of finding the desired forms, therefore, probably greater than if much time had elapsed after the inoculation. It was not presumed, of course, that the disease itself could possibly develop in this short time.

The most noticeable characteristic in preparations made during the first day or two following the inoculation was the presence in enormous numbers of small pink staining coccoid bodies resembling the "elementary bodies" of von Prowazek. These were to be found everywhere throughout the preparation, and the leucocytes were crowded with them. ((22), (23), (29), (30), Pl. III.) On the other hand, the organisms originally introduced, which stain blue with Giemsa, were comparatively few in number and many were faintly stained, indicating loss of vitality. Apparently the original rod-shaped organisms ((21), (28), Pl. III) which stain blue with Giemsa stain had been transformed into the smaller coccoid bodies staining pink or reddish with Giemsa.

The presence of the small coccoid forms suggests an explanation of the "elementary bodies" seen in film preparations from the conjunctiva of trachoma cases. These, as stated previously, have been found within the epithelial cells embedded in the bluish "mantle," and also free outside the cells and occasionally in the leucocytes. In the case of the "elementary bodies" experimentally produced, it is quite evident that they were produced as the result of environmental conditions to which the rod-shaped bacteria introduced were exposed in the conjunctiva. That such forms are produced in the conjunctiva and not in ordinary culture media is obviously due to the fact that there are present in the conjunctiva certain substances antagonistic to the presence and to the growth of the invading organisms, which substances probably act by tending to dissolve them. When this lytic action takes place outside the cells, the portion which has been dissolved is not visible. The part which remains of each bacterium is the small coccoid eosinophilic portion, which probably corresponds with the "elementary body" of von Prowazek.



(21) Culture of gram-negative rod isolated from trachoma case. (22–27) Same culture in conjunctiva of guinea pig. (22) Numerous small coccoid forms free and in leucocyte. (23) Some of rod-shaped organisms in or on cytoplasm of epithelial cell and in leucocyte. Also small coccoid forms free and in leucocyte. (24) Forms resembling Lindner "free initial bodies" and transition forms between rods and "initial bodies." (25, 26) Bipolarly stained forms resembling Lindner "initial bodies" in or on cytoplasm of epithelial cells. (27) Group of bacteria near nucleus of epithelial cell suggesting inclusion body. (28) Culture of gram-negative rod from another trachoma case. (29, 30) Same culture in conjunctiva of guinea pig. (29) Small coccoid forms free and in leucocyte. (30) Numerous small coccoid forms mostly in the leucocytes

Approximately × 1,000. Giemsa stain. Photographs by M. K. Underwood

Such lytic action may take place to some extent outside the epithelial cells in human trachoma, but it takes place also within the protoplasm of the epithelial cell. In this case the action is probably similar to that occurring outside the cells to the extent that a lytic substance acts upon the bacteria which have invaded the cell and reduces them to the small reddish staining forms. Here the lytic substance is probably secreted or produced in the cell itself. The result of the lytic action within the cell, however, differs from that taking place outside the cells, in that the portion which has been acted upon by the lytic agent is contained within the cytoplasm of the cell for a time and still retains its basophilic property and, therefore, stains blue as did the original organism, thus forming the "mantle" in which the reddish staining coccoid forms are embedded. The lytic action within the cell may be either less in degree or it may take place more slowly than outside the cell. This is indicated by the fact that the small coccoid bodies when seen emerging from the epithelial cell appear to be stained more distinctly than are those found at some distance away from the cell. The slower or less complete action is also indicated by the fact that the "mantle" shows varying degrees of density, being very distinct in the early stages, then becoming less and less in evidence, and eventually being absorbed. As the "mantle" fades, the small coccoid forms become more distinct.

In regard to the nature of the lytic substance, the recent work of Fleming, and Fleming and Allison on "lysozyme" is very suggestive. This substance which has a "powerful inhibitory, bactericidal and bacteriolytic effect" on certain bacteria is present in the tissues and secretions of the body and occurs in particularly high concentration in human tears. It would seem that this substance plays an important part in bringing about the peculiar manifestations of the growth of certain bacteria in the conjunctiva.

In addition to the forms resembling the "elementary bodies," there were found in certain cases others corresponding to the Lindner "initial bodies" and the Lindner "free initial bodies." The latter are the bipolarly stained oval or cylindrical bodies which appear blue in Giemsa-stained preparations. These bodies present the appearance of being stained only at the rim, except at the ends where the stained portion is considerably wider. Some of the forms observed were perfectly definite in outline and stained fairly distinctly, and they correspond very well with those described and depicted by Lindner and resemble those found a few times in the film preparations from human cases of trachoma. Their resemblance to spores tempts one at times to classify them as such; but this is questionable. These bodies were found both free outside the cell ((24) Pl. III) and apparently within the cytoplasm of the epithelial cells ((25), (26) Pl. III) in preparations made a day or two after from the conjunctiva of guinea pigs inoculated with a certain culture. Transitional forms between the rods and swollen bipolarly stained forms were readily distinguishable. ((24) Pl. III.) It seems probable, therefore, that the so-called Lindner "initial bodies" are modified or pleomorphic forms of rod-shaped bacteria, and that they are due to the unusual environmental condition in which they exist and are not peculiar organisms nonbacterial in nature as has been considered by Lindner.

In the preparations examined, in a few instances there were found groups of bacteria in or on the cytoplasm of the epithelial cell ((27) Pl. III), suggesting inclusion bodies; but these did not show any evidence of having progressed to the stage where the small coccoid forms were in evidence and could not be considered truly typical. The bipolarly stained bodies corresponding with the Lindner "initial bodies" found in the cytoplasm of the cell ((25), (26) Pl. III) might also be regarded as "inclusion bodies"; but in this case also they could not be regarded as typical of inclusion bodies in human trachoma, as they occurred more or less separated from each other and not in the form of a dense mass. The fact is to be taken into consideration, however, that the epithelial cell of the guinea pig probably differs from the human epithelial cell, both as to consistency and as to lytic action of the cytoplasm, and probably also in reaction. The action discribed is not specific, particularly in the case of the small reddish staining coccoid forms, for they can be readily produced by the inoculation of various gram negative rods. The Lindner "initial bodies" were not as readily produced, and it is possible that these develop from a more limited number of organisms.

SUMMARY AND CONCLUSION

It has been possible to produce experimentally forms corresponding in appearance to the so-called "elementary bodies" of von Prowazek and the "initial bodies" of Lindner, by the inoculation of certain gram-negative rod-shaped organisms isolated from the conjunctiva of trachoma cases, into the conjunctiva of guinea pigs. A study of preparations made a short time after the inoculations suggests that the "elementary bodies" and "initial bodies" represent modifications of the organisms originally introduced which are brought about by the action of lytic substances contained in the conjunctival fluids and tissues.

The results of the work considered do not prove or disprove that the "elementary bodies," "initial bodies," and inclusion bodies are concerned etiologically in trachoma. This discussion is presented merely to show that these bodies in all probability are bacterial in character, and that the bacteria from which they originated are rod-shaped in form. The fact of their presence in a considerable percentage of trachoma cases is an indication that they may be of etiological significance, but the question can not be answered definitely as yet.

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COURT DECISIONS RELATING TO PUBLIC HEALTH

Private law creating special sanitary and maintenance district in certain county held void and general act authorizing creation of sanitary districts held constitutional.—(North Carolina Supreme Court; Drysdale et al. *v.* Prudden et al., 143 S. E. 530; decided June 6, 1928.) In this case, a controversy without action under section 626 of the Consolidated Statutes, the plaintiffs constituted the board of Druid Hills sanitary district and the defendants were engaged in the business of investment banking. The said sanitary district was created pursuant to an act ratified March 4, 1927, constituting chapter 100 of the Public Laws of 1927. At an election upon the question of the issuance of bonds by the district the vote was unanimous for the issuance of same. The plaintiffs took proceedings for the issuance of the bonds of the sanitary district in the aggregate principal amount of $75,000 for the purpose of acquiring, constructing, maintaining, and operating a sewerage system and water-supply system, and entered into a contract with the defendants whereby the latter agreed to purchase said bonds. The contract stipulated, however, that the defendants should not be obligated to take up and pay for the bonds unless they constituted the full and valid obligation of the sanitary district and were payable from an unlimited ad valorem tax upon all taxable property of the district and not from special assessments. The defendants refused to accept delivery of the bonds, but the agreed statement of facts in the case contained the provision that "if the plaintiffs are authorized to issue them and they will constitute the full and valid obligations of Druid Hills sanitary district, payable from an unlimited ad valorem tax upon all taxable property of said district, and not from special assessments, then the defendants stand ready, willing, and able to take up and pay for the same in accordance with their contract."

The identical territory comprising the said sanitary district was created or attempted to be created into a sanitary and maintenance district by a special act ratified March 7, 1927, constituting chapter 229 of the Private Laws of 1927. The State constitution, article 2, section 29, provided:

> The general assembly shall not pass any local, private, or special act or resolution * * * relating to health, sanitation, and the abatement of nuisances; * * * Any local, private, or special act or resolution passed in violation of the provisions of this section shall be void. * * *

The supreme court stated that practically only two material questions were presented, namely:

Was chapter 229 of the Private Laws of 1927 a local, private, or special act, in violation of section 29 of article 2 of the State constitution, and therefore void?

Was chapter 100 of the Public Laws of 1927 constitutional and the bonds valid?

The court held that chapter 229 of the Private Laws was void and that chapter 100 of the Public Laws was constitutional, and closed its opinion with the following language:

> The act [chapter 100] is sane, sound, and sensible—well within the police power of the State to pass. Therefore, we think that chapter 100 of the Public Laws of 1927 is constitutional, and that the proposed bonds under said act are valid and binding obligations of the Druid Hills sanitary district, and are payable from an ad valorem tax against all the taxable property within the boundaries of said district, and that the judgment of the court below should be affirmed.

Portion of milk ordinance making charge for inspection of dairies more than 5 miles beyond city limits held void.—(Florida Supreme Court, Division B; Root *v.* Mizel, Chief of Police, 117 So. 380; decided May 30, 1928.) In habeas corpus proceedings the return to the writ alleged in effect that the petitioner was held for violating the milk ordinance of the city of Bartow in having in his possession milk for sale from a dairy not having a permit as required by the ordinance. The said ordinance, among other things, required that a person selling or having in his possession for sale within the city any milk or milk products should first procure a permit from the city health department to do so, and prohibited such person from offering for sale within the city any milk or milk products from any dairy which had not secured such a permit from the city, the said permit to cost $1 annually. The ordinance also required the city health officer to make inspections at least once per month, and, where the dairy was more than 5 miles beyond the city limits, a charge of $25 per day was made, payable in advance. The lower court remanded the petitioner to the custody of the appellee, but the supreme court on appeal ordered the petitioner discharged from custody, saying:

No authority is shown to inspect dairies beyond the city limits. It is shown that dairies within the 5-mile limit are charged no fee for inspection while those beyond the 5-mile limit where no authority is shown to inspect are charged $25 per month, or $300 per year, for inspection. The dairies furnishing the milk that petitioner is charged with having in possession for the purpose of sale without a permit are shown to be 50 or 60 miles from the city of Bartow.

For these and other reasons prevalent on the face of the record that portion of ordinance No. 12a providing $25 per day for inspections made 5 miles beyond the city limits is unreasonable and void, so the judgment below is reversed, and the petitioner ordered discharged from custody.

AMERICAN PUBLIC HEALTH ASSOCIATION MEETS AT CHICAGO, OCTOBER 15–19, 1928

The American Public Health Association will hold its fifty-seventh annual meeting at Chicago, Ill., from October 15 to 19, with headquarters at Hotel Stevens. Two other national health organizations, the American Child Health Association and the American Social Hygiene Association, will meet jointly with the American Public Health Association. The first general session will be called Monday evening, when Dr. Herman N. Bundesen, president of the American Public Health Association, will give the presidential address, and either the president of the American Child Health Association or his representative will also speak at this opening meeting. The second general session, scheduled for Wednesday evening, will be devoted to a discussion of the following topics: Our organizations for the care of the sick; which public health procedures pay; and how to use effectively civic groups in promoting health programs.

Sanitarians and persons interested in preventive medicine will this year have unusual opportunities to hear reports and discussions of the latest findings in their particular field, for the sessions of the week have been increased over the number of previous years.

There will be a total of 42 sessions; 31 of these will be meetings of sections of the association, including health officers, industrial hygiene, food, drugs, and nutrition, laboratory, public-health engineering, child hygiene, vital statistics, public-health education, and public-health nursing.

Special sessions have been arranged for the discussion of cancer, training for the public health professions, dairy products, and epidemiology. The joint sessions will bring together the following sections: Health officers, public health nursing, child hygiene; laboratory and food, drugs, and nutrition; laboratory and public health engineering; child hygiene, public health education, and the health education division of the American Child Health Association. The health officers will devote one session to rural health work.

A symposium on preschool health supervision procedures will be treated from the angle of the small town and rural areas, the small city, and a limited area of a large city. Infant mortality studies and maternal mortality, school medical and nursing service, medical service in continuation schools, sickness and absence records in the school health program, and objectives of dental health education will be discussed in the child hygiene section meetings with the American Child Health Association.

The public health engineering section has planned symposia on the sterilization of milk utensils, shellfish sanitation, and methods of financing water supply and sewerage improvements. Atmospheric pollution by smoke and odors, useless noises and their relation to public health, and school-room ventilation as it is related to absenteeism will be discussed by this group. A practical problem to be presented at a session of the engineers will be carbon monoxide pollution of air in Chicago.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Methods for Malaria Control. Anon. *Journal American Medical Association*, vol. 90, No. 17, April 28, 1928, p. 1387. (Abstract by J. A. LePrince.)

"The malaria section of the seventh congress of the Far Eastern Association of Tropical Medicine, which met in Calcutta in December, 1927, stressed the need of malaria research officers, and of expert malarial engineers. The section passed resolutions stating that, in many instances, a great increase in malaria was caused by mosquito reproduction around engineering works, either during construction or afterwards, as a result of the different conditions brought about. The congress held that plans for canals, railways, harbors, and similar engineering works should be submitted to the proper public health authorities before being sanctioned by governments. The fact was emphasized that there is no single method of malaria control applicable to all conditions. Nevertheless, the congress considered that for large public works, plantations, mines, and towns, the method of controlling the breeding places of mosquitoes should be employed, whatever other antimalaria measures were enforced, and that this should be effected by permanent works which would eliminate entirely the source of mosquito breeding for rural areas, especially those with scanty populations. There is a variety of methods of prevention, including drainage, jungle clearing, jungle preservation, bonification, the promotion of agriculture, improvement of housing and general economic condition, and the education of the people. The use of antimalarial drugs, the screening of buildings, the systematic killing of mosquitoes, and many other special methods are to be considered in their proper relation."

(Abstractor's note.—From the above it is evident that these difficulties will continue until sanitary engineers and other health workers learn how to sell applied public health to executives, construction engineers, and others responsible for creating unsafe health conditions. Until sanitarians learn how to sell a desire for disease freedom and mosquito freedom, they, and they only, will be the agents responsible for such conditions as the above being allowed to exist.)

The House Fly (Musca domestica). Fannie O'Riordan. *Journal State Medicine*, vol. 36, No. 2, February, 1928, pp. 96–100. (Abstract by C. L. Pool.)

This essay, awarded a prize and published by the College of Pestology, condenses into five pages a liberal knowledge of *Musca domestica* under the following headings: Species, description, life history, season, breeding, relation to disease, remedies and preventives. An excellent spray for breeding places: Carbolic, 5 parts, citronella oil, 1 part, and paraffin oil, 14 parts. A saucer of milk and water containing 1 part of formalin in 20 kills flies immediately upon drinking. Maggots can not breed in dry refuse.

Malaria Control for Cities and Counties. L. L. Williams, jr. *Virginia Medical Monthly*, vol. 55, No. 3 (whole No. 912), June, 1928, pp. 198–200. (Abstract by R. S. Smith.)

The author states that the object of the article is to present as simply as possible an outline of those specific measures which, if applied in this country, will control malaria. He states that there are but two certain measures of control, namely, adequate screening and the control of the production of the *Anopheles* mosquito. The procedure of Google in Mississippi relative to screening is given in detail. The author states that following this procedure no one can say that it can not be done.

Under Mosquito Control the author discusses three methods: Control of all mosquitoes, control of *Anopheles*, and control of *Anopheles quadrimaculatus* only.

It is stated that drainage is the most effective method of controlling the production of mosquitoes. Undrainable places must receive weekly doses of oil throughout the summer season. Where only *Anopheles* are to be stopped, it becomes necessary to search out their exact breeding places. As these are found, they are put under control by drainage or seasonal treatment. Paris green mixed with road dust, 1 part Paris green to 99 parts of diluent dust, cast on the windward side of the breeding area, does the work of spreading. One pound of Paris green per acre of breeding area is enough.

Where control of production of *Anopheles quadrimaculatus* only is contemplated, the work is much simplified. This type breeds only in water with no apparent current. Quiet water ponds within a mile of a town or small community can be drained or Paris green may be applied once a week.

Report of Bureau of Malaria Control, Part III. Anon. *Porto Rico Review of Public Health and Tropical Medicine*, vol. 3, No. 8, February, 1928, pp. 321–330. (Abstract by F. J. Laverty.)

Spleens and blood smears examined from 400 people and blood smears from an additional 600 show the spleen rate more or less uniformly high for the 5–50 year age group, the rate being lower in the very young and in the very old. "The parasite rates showed a much more definite peak in the 5–20 year age group, particularly in those from 10 to 20 years of age, where they are much higher than the spleen rates. In adults the parasite rate tends to drop behind the spleen rate."

Major drainage of 800 acres of swamp land shows a preliminary lowering of acute malaria incidence which will have to be observed through other seasons before definite conclusion may be drawn. Results of observations of some eight different screening materials are summarized with particular attention to wind obstruction.

Tables giving statistical results of spleen and blood indexes by age group and districts, spleen and blood examination, average per cent of hemoglobin, and data on wind obstruction complete this section of the report.

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Entomological Notes—Spreading of the Anopheles. Ernst Rodenwaldt. *Mededeelingen van den dienst der Volksgezondheid in Nederlandsch-Indie,* Foreign Edition, 1927, part 3, pp. 514–523. (Abstract by H. R. Crohurst.)

Presents in tabular form, from the results of catches or analysis of specimens sent to the laboratory at Weltevreden by Government doctors and army medical officers, the geographical distribution of mosquitoes. Presents also the biology of *Nyssorhynchus maculatus, Myzomyia ludlowi,* and *Stethomyia aitkeni,* Var. Palmata N. V.

Economical Treatment of Swimming Pool Waters. Lewis O. Bernhagen. Proceedings Tenth Texas Water Works Short School, January, 1928. Pp. 150–155. (Abstract by H. N. Old.)

Herein are given briefly the principal standards of water quality for pools as formulated by the Joint Committee on Swimming Pool Standards, followed by a discussion of the three general types of pools, namely, the fill-and-draw, the flowing-through, and the recirculation pools.

The author states that at Beaumont, Tex., water was supplied to a flowing-through pool by a well at slightly less than 5 cents per 1,000 gallons, using air-lift pumping equipment, air being supplied by a compressor operated by a 20-horsepower motor with power cost of 3 cents per kilowatt-hour.

However, as most wells put down at a moderate cost can not be depended upon for an unfailing supply, a hypothetical example of comparative costs for a 600,000-gallon pool is worked out, with itemized estimate of initial cost and operation of recirculation pool with filtration and disinfection, and operating cost of flowing-through pool. It is estimated that the former will give a 51 per cent return on the initial investment of $6,500 over that of the latter method.

There follows a brief discussion by Paul S. Fox, bringing out the necessity for the enforcement of soap and water cleansing of bathers prior to use of a pool, the importance of water temperature not exceeding 72° F., and the advantages of chlorine compounds over ultra-violet ray disinfection.

Application of Hydrogen Ion Control to Water and Sewage Work. W. A. Taylor. Proceedings Tenth Texas Water Works Short School, January, 1928. Pp. 117–134. (Abstract by H. N. Old.)

The author devotes the greater part of this article to a detailed explanation of the meaning of hydrogen ion concentration and the methods by which it may be determined. The colorimetric method is described in detail. The meaning of the term pH is given by means of a rather technical discussion of the subject.

The application of pH control to water purification, particularly in the matter of securing the optimum pH for the most economical coagulation of public water supplies, is treated at some length. With the use of alum it has been found that the optimum for the majority of waters lies between pH 5.5 to 7.0, varying with the character of water to be treated.

That the proper pH control is of great value in correction of "red water," and other problems due to corrosive action, is brought out, as well as its applicability to water-softening processes and with particular reference to boiler feed water, cooling water for condensers, and refrigerating brines.

With relation to sewage-disposal work, the investigations conducted by Doctor Rudolfs, of New Jersey, are made the basis of applicability of pH control to the most efficient sludge digestion methods, whether in Imhoff, septic, or separate sludge digestion tanks. It is stated that Doctor Rudolfs finds the optimum for sludge digestion is pH of 7.3 to 7.6. At Milwaukee it has been found that activated sludge can be freed from water most effectively when the pH value is brought down to about 3.4 by the addition of acid.

The author concludes his article with a discussion of the application of pH control to the problem of industrial waste treatment. It is stated that, in the treatment of various textile wastes, the most efficient purification takes place at pH values from 6.0 to 9.0, particularly if ferrous sulphate is used as coagulant, the most general value being 8.0 to 8.2 for copperas and 7.2 for alum.

Comparative Colon-Aerogenes Indices of Water and Sewage. Ralph E. Noble. *Journal American Water Works Association*, vol. 19, No. 6, June, 1928, pp. 733–746. (Abstract by H. D. Cashmore.)

The author gives an account of his effort to develop a rather critical comparison between the cyanide-citrate agar pour plate method and the lactose broth procedure in common use to-day.

Summary: (1) 1,051 samples were run by both methods; (2) 76.7 per cent of the samples by the plate method gave results equal to or higher than the lactose broth tubes; 22.2 per cent were negative by both methods; 13.4 per cent were negative by the tube method and positive by the plate method, while 9.3 per cent gave the opposite result; (3) the following facts were apparent:

(*a*) Over the range of 0 to 100 *coli-aerogenes* organisms per 100 c. c. the mean plate indices exceeded the Phelps indices; (*b*) the medium plate indices equaled or exceeded the Phelps indices over the range of 0 to 100 per 100 c. c., but regressed from the m. p. n. after the Phelps index of 2 to 10,000 per 100 c. c., excepting for the index of 10; (*c*) the expression of model plate indices was believed to be an unfair method of presentation in this study, owing to relatively insufficient numbers in six groups; (*d*) all the plate indices were derived from 10-c. c. portions, except 10 based on 1.0 c. c. portions, which were evenly distributed between the groups 1,000 to 10,000 per 100 c. c.; (*e*) on the whole, plate indices exceeded the Phelps indices derived from 10.0 c. c. and 1.0 c. c. portions. The smaller indices by the plate method in the groups 1,000 to 10,000 per 100 c. c. are believed to be due to the effect of dilution; (*f*) the most representative plate index is derived from the first or second dilution lower than the Phelps, and equals or exceeds the latter. When the two types of indices are derived from dilutions further apart than two, the Phelps index will probably exceed that of the plates. Under these conditions the latter is probably more reliable on account of a larger number of organisms.

(4) The theory of m. p. n. fails, as does the Phelps unit, to consider the biological principles of synergism and antibiosis, often functioning in presumptive tests, on account of their theoretical mathematical exactness.

(5) Conditions common to both influence the Phelps index and m. p. n., hence a change in one almost automatically means an associated change in the other with a constant mathematical difference at given magnitudes.

(6) The effect of random sampling is common to both methods, and so it is fair to conclude that the plate method affords a closer approximation of the actual mean density of organisms of the *coli-aerogenes* group in water and sewage than the tube method.

Included in the article are tables and graphs giving the results of the work. A discussion of the paper by Dr. Lowell J. Reed, of Johns Hopkins University is appended.

Biochemical Oxygen Demand. Leroy Forman. *Public Health News*, N. J. State Department of Health, vol. 13, No. 6, May, 1928, pp. 132–136. (Abstract by D. S. Abell.)

This article describes the results of several series of experiments in an attempt to secure uniform and consistent results in the determination of biochemical oxygen demand. Tests were made to determine the effect of using different temperatures for aeration of diluting water, the effect of aging diluting water, the temperature of incubation, the effect of using distilled or Trenton tap water, and the effect of adding salts to increase the pH. Some of the conclusions are: (1) That all factors must be controlled; (2) aged tap water is satisfactory at any one plant, but for comparison of results with other plants a uniform diluting water is necessary; (3) the nature of the material is considered a less important factor than formerly; (4) "the greatest factor for obtaining good results in b. o. d. determinations are—(*a*) Mineralized water, preferably with potash salts, with a pH well on the alkaline side; (*b*) well aged diluting water; and (*c*) incubation at a uniform temperature and not below 20° C." The paper is concluded with the modified procedure for b. o. d. determination adopted by the New Jersey State Department of Health.

The Design and Construction of Small Filtration Plants. Howard K. Bell. *The American City*, vol. 38, No. 6, June, 1928, pp. 131–134. (Abstract by J. H. O'Neill.)

This article is from a paper read before the Kentucky-Tennessee section of the American Water Works Association and discusses the subject on the basis of the following principal factors determining or modifying the design of small purification works: Available funds, probable demand, character of supply, reservoir storage, operation force, character of power for pumping, new layout or addition to old pumping plant, topographic characteristics of site and ground available, probabilities of future expansion, climate, and fire service. Comments are made on special features of design, such as—Grouping of parts; filters; gages; controllers and meters; filter wash; chemical storage; mixing devices; settling basins and drainage.

DEATHS DURING WEEK ENDED AUGUST 11, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended August 11, 1928, and corresponding week of 1927. (From the Weekly Health Index August 15, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Aug. 11, 1928	Corresponding week, 1927
Policies in force	71, 589, 745	68, 176, 376
Number of death claims	11, 992	10, 588
Death claims per 1,000 policies in force, annual rate	8. 8	8. 1

Deaths from all causes in certain large cities of the United States during the week ended August 11, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index August 15, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Aug. 11, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Aug. 11, 1928 [2]
	Total deaths	Death rate [1]		Week ended Aug. 11, 1928	Corresponding week, 1927	
Total (70 cities)	6, 882	11. 7	10. 4	711	670	57
Akron	36			1	3	11
Albany [3]	34	14. 8	11. 3	1	4	20
Atlanta	88	18. 0	8. 8	11	6	
White	51		6. 8	6	2	
Colored	37	(4)	13. 4	5	4	
Baltimore [3]	237	14. 9	11. 0	36	29	114
White	166		8. 9	26	20	104
Colored	71	(4)	22. 9	10	9	157
Birmingham	78	18. 3	13. 9	16	8	137
White	39		9. 0	9	2	124
Colored	39	(4)	21. 5	7	6	158
Boston	198	13. 0	11. 2	22	21	61

[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] Deaths for week ended Friday, Aug. 10, 1928.
[4] 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; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended August 11, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, August 15, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Aug. 11, 1928: Total deaths	Week ended Aug. 11, 1928: Death rate	Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year: Week ended Aug. 11, 1928	Deaths under 1 year: Corresponding week, 1927	Infant mortality rate, week ended Aug. 11, 1928
Bridgeport	36			3	2	55
Buffalo	137	12.9	11.4	20	7	86
Cambridge	23	9.6	9.7	3	2	53
Camden	34	13.1	8.6	4	2	64
Canton	19	8.5	7.4	1	0	24
Chicago [3]	643	10.7	10.6	58	70	50
Cincinnati	113	14.3	15.7	17	14	103
Cleveland	179	9.3	8.3	19	17	52
Columbus	74	13.0	12.2	4	4	37
Dallas	54	13.0	11.3	7	8	
White	39		11.0	6	7	
Colored	15	(4)	13.3	1	1	
Dayton	48	13.6	8.7	3	5	50
Denver	65	11.6	13.1	4	12	
Des Moines	36	12.4	7.7	4	1	66
Detroit	230	8.7	9.1	18	45	28
Duluth	29	13.0	9.5	8	6	187
El Paso	31	13.8	12.9	2	5	
Erie	18			2	4	41
Fall River [3]	29	11.3	7.1	3	3	51
Flint	37	13.0	7.3	8	6	102
Fort Worth	28	8.7	11.2	2	6	
White	19		10.9	1	5	
Colored	9	(4)	13.3	1	1	
Grand Rapids	22	7.0	6.8	2	3	30
Houston	60			8	8	
Indianapolis	104	14.2	12.0	8	7	61
White	87		11.6	7	5	61
Colored	17	(4)	15.1	1	2	61
Jersey City	74	11.9	10.4	11	6	82
Kansas City, Kans	30	13.3	11.1	4	5	84
White	19		10.3	4	4	99
Colored	11	(4)	14.8	0	1	0
Kansas City, Mo	79	10.6	11.3	10	7	71
Knoxville	26	12.9	15.3	3	3	65
White	19		13.9	2	3	48
Colored	7	(4)	25.6	1	0	213
Los Angeles	222			23	23	66
Louisville	96	15.2	12.5	11	6	92
White	73		11.9	10	6	95
Colored	23	(4)	16.0	1	0	69
Lowell	12	5.7	11.8	2	8	42
Lynn	23	11.4	6.0	1	2	25
Memphis	65	17.9	14.6	6	2	70
White	32		10.4	2	2	37
Colored	33	(4)	22.2	4	0	125
Milwaukee	89	8.6	9.6	9	12	40
Minneapolis	79	9.1	10.0	5	9	30
Nashville	35	13.2	11.7	4	1	63
White	19		9.0	2	1	43
Colored	16	(4)	18.8	2	0	120
New Bedford	21	9.2	14.0	2	5	43
New Haven	25	7.0	3.7	2	1	28
New Orleans	150	18.3	17.8	12	20	58
White	83		14.9	3	13	22
Colored	67	(4)	26.0	9	7	131
New York	1,352	11.7	9.8	122	104	49
Bronx Borough	183	10.1	6.6	17	7	51
Brooklyn Borough	436	9.9	9.5	35	52	35
Manhattan Borough	545	16.3	13.0	60	37	71
Queens Borough	138	8.4	6.8	7	7	28
Richmond Borough	50	17.3	12.8	3	1	54
Newark, N. J	99	10.9	12.4	8	13	41
Oakland	49	9.3	7.4	4	7	43
Oklahoma City	31			7	8	

[3] Deaths for week ended Friday, Aug. 10, 1928.

[4] 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; Birminghom, 39; Dallas, 15; Fort Worth, 14; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended August 11, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index August 15, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Aug. 11, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Aug. 11, 1928
	Total deaths	Death rate		Week ended Aug. 11, 1928	Corresponding week, 1927	
Omaha	50	11.7	13.6	3	7	35
Paterson	27	9.7	13.4	4	2	69
Philadelphia	436	11.0	9.0	46	39	62
Pittsburgh	167	13.0	10.0	26	27	85
Portland, Oreg	64			2	4	21
Providence	62	11.3	8.5	14	2	122
Richmond	61	16.4	13.6	9	9	118
White	34		11.9	2	6	41
Colored	27	(4)	17.8	7	3	257
Rochester	74	11.8	9.2	8	7	65
St. Louis	207	12.8	12.3	14	19	47
St. Paul	48	10.0	8.3	5	2	48
Salt Lake City [3]	33	12.5	6.9	3	3	49
San Antonio	78	18.7	14.1	17	11	
San Diego	32	14.0	15.8	2	1	38
San Francisco	137	12.2	12.1	7	5	44
Schenectady	13	7.3	6.2	1	0	31
Seattle	58	7.9	8.8	1	1	10
Somerville	13	6.6	5.6	3	0	104
Spokane	28	13.4	9.6	1	1	26
Springfield, Mass	23	8.0	10.6	4	4	63
Syracuse	37	9.7	10.9	3	6	36
Tacoma	29	13.7	4.9	0	0	0
Toledo	72	12.0	9.9	7	2	67
Trenton	42	15.8	10.3	3	1	51
Utica	19	9.5	8.6	3	1	68
Washington, D. C	143	13.5	12.0	11	10	63
White	81		8.5	4	7	23
Colored	62	(4)	22.2	7	3	129
Waterbury	14			4	1	116
Wilmington, Del	27	11.0	12.0	3	3	79
Worcester	38	10.1	12.3	7	1	85
Yonkers	23	9.9	9.2	4	1	91
Youngstown	31	9.3	10.8	5	3	67

[3] Deaths for week ended Friday, Aug. 10, 1928.

[4] 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; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Reports for Weeks Ended August 18, 1928, and August 20, 1927

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended August 18, 1928, and August 20, 1927

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927
New England States:								
Maine		5	1		16	8	0	
New Hampshire			6		12		0	
Vermont	2				1	9	0	0
Massachusetts		61		1		46		2
Rhode Island		8			14	1	0	0
Connecticut	7	15	2	1	19	6	3	0
Middle Atlantic States:								
New York	99	146	[1] 1	[1] 8	194	70	32	2
New Jersey	47	59			43	4	9	0
Pennsylvania	88	75			179	37	4	0
East North Central States:								
Ohio	46		20		131		1	
Indiana	10	13	3	6	9	5	0	0
Illinois	63	74	27	5	26	23	7	9
Michigan	65	60		1	26	23	3	1
Wisconsin	11	16	30	10	17	88	2	4
West North Central States:								
Minnesota	20	20	2	2	6	5	0	3
Iowa	8	10				6	0	1
Missouri [2]	21	24		1	9	6	1	2
North Dakota	4	6			7		2	6
South Dakota	4	2	3		9	2	0	0
Nebraska	9	5	3	1	1	1	0	0
Kansas	1	9		1	6	18	0	1
South Atlantic States:								
Delaware						1	0	0
Maryland [3]	32	23	2	5	12	15	0	1
District of Columbia	10	8		1	7	1	0	0
Virginia								
West Virginia	10	14	5	2	10	12	0	1
North Carolina	33	59			12	183	0	0
South Carolina	6	25	254	100		40	0	0
Georgia	10	23	39	24	4	13	0	0
Florida	10	9	40	1	1	2	1	0

[1] New York City only.
[2] Figures for 1928 are exclusive of Kansas City.
[3] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended August 18, 1928, and August 20, 1927—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927
East South Central States:								
Kentucky	2						2	
Tennessee	1	12	9	4	13	13	1	0
Alabama	17	32	37	17	7	16	0	1
Mississippi	5	16					0	
West South Central States:								
Arkansas	4	2	26	8	1		0	0
Louisiana	5	20	20	13	13	1	0	0
Oklahoma [4]	11	10	17	7	3	34	0	1
Texas	8	24	29	6	3	13	0	0
Mountain States:								
Montana	1	5			2		3	1
Idaho	2	3					1	0
Wyoming	5					3	3	0
Colorado	5	12			6	1	1	1
New Mexico	2	2				26	0	0
Arizona		1			3	2	0	0
Utah [2]		3	2		3	1	1	1
Pacific States:								
Washington	1	20			7	20	2	1
Oregon	8	7	4	6	9	7	2	5
California	60	55	15	3	4	43	4	4

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927
New England States:								
Maine	1	1	9	19	1	0	2	5
New Hampshire	0		3		0		1	
Vermont	0	0	4	2	0	0	0	1
Massachusetts		38		88		0		13
Rhode Island	0	1	2	1	0	0	3	2
Connecticut	5	17	5	13	0	0	7	5
Middle Atlantic States:								
New York	94	20	55	68	0	8	54	36
New Jersey	10	22	15	34	0	0	24	15
Pennsylvania	3	7	39	70	0	0	58	40
East North Central States:								
Ohio	12	65	44		7		47	
Indiana	1	2	25	26	10	23	14	16
Illinois	5	16	45	75	6	12	31	49
Michigan	1	9	42	54	3	11	19	19
Wisconsin	2	7	29	45	3	5	8	13
West North Central States:								
Minnesota	4	1	47	40	1	0	10	3
Iowa	2	3	10	7	0	14	6	5
Missouri [2]	2	2	24	19	2	5	31	32
North Dakota	8	0	4	11	0	1	0	0
South Dakota	2	1	9	3	1	7	0	2
Nebraska	0	1	14	1	9	0	10	4
Kansas	1	10	15	12	17	3	32	27
South Atlantic States:								
Delaware	1	0	3	0	0	0	3	6
Maryland [3]	29	1	7	11	0	0	43	56
District of Columbia	3	0	1	5	0	1	3	4
Virginia								
West Virginia	4	8	0	26	2	4	30	42
North Carolina	2	0	24	25	10	10	71	55
South Carolina	3	1	0	11	1	21	57	77
Georgia	0	1	10	8	0	0	42	83
Florida	0	0	0	1	1	2	6	13

[2] Figures for 1928 are exclusive of Kansas City. [3] Week ended Friday. [4] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended August 18, 1928, and August 20, 1927—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927	Week ended Aug. 18, 1928	Week ended Aug. 20, 1927
East South Central States:								
Kentucky	4		15		2		35	
Tennessee	2	1	10	9	0	5	88	92
Alabama	1	2	6	22	0	3	55	88
Mississippi	1	1	5	9	0	1	34	28
West South Central States:								
Arkansas	1	1	2	4	0	6	55	0
Louisiana	0	2	1	8	0	2	48	37
Oklahoma [4]	2	7	14	5	8	5	81	101
Texas	0	15	8	13	1	1	19	24
Mountain States:								
Montana	4	0	0	103	0	0	3	2
Idaho	1	0	3	3	3	1	3	0
Wyoming	0		8		1		2	
Colorado	5	1	9	8	0	0	1	8
New Mexico	1	8	3	7	0	0	2	12
Arizona	0	4	0	4	0	0	0	8
Utah [3]	0	1	7	6	0	2	2	1
Pacific States:								
Washington	15	1	6	10	3	13	4	9
Oregon	1	12	1	3	14	6	8	4
California	5	44	34	48	6	5	22	16

[3] Week ended Friday. [4] Exclusive of Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
May, 1928										
Hawaii Territory	2	18	34		7		0	15	0	5
June, 1928										
Delaware	0	2			59		1	9	2	3
Hawaii Territory	3	38	22		13		1	4	0	5
Idaho	5	4			12		1	22	19	5
Montana	8	15		1	41		1	14	46	9
South Carolina	3	99	1,447	1,539	573	1,432	9	21	37	301
Wisconsin	11	51	294		193		2	409	53	5
July, 1928										
Arizona	2	3	2		54		1	4	4	6
Connecticut	4	51	7	1	798		5	66	0	4
Nebraska	0	13	3		10			47	57	5
New Hampshire	1	9	25				2	12	0	0
North Dakota	6	10	4		34		7	87	5	6
Tennessee	3	28	74	454	103	77	2	34	41	267
Vermont		2			177		2	14	0	1

May, 1928

	Cases
Hawaii Territory:	
Chicken pox	40
Conjunctivitis	14
Dysentery (amebic)	1
Hookworm disease	7
Leprosy	4
Mumps	25
Paratyphoid fever	1
Tetanus	2
Trachoma	124
Whooping cough	8

June, 1928

	Cases
Chicken pox:	
Delaware	5
Hawaii Territory	44
Idaho	31
Montana	25
South Carolina	118
Wisconsin	804
Conjunctivitis:	
Hawaii Territory	8
Dengue:	
South Carolina	8
Dysentery (amebic):	
Hawaii Territory	1
Hookworm disease:	
Hawaii Territory	6
South Carolina	143
Leprosy:	
Hawaii Territory	5
Lethargic encephalitis:	
Montana	1
Wisconsin	5
Mumps:	
Delaware	17
Hawaii Territory	16
Idaho	7
South Carolina	6
Wisconsin	188
Ophthalmia neonatorum:	
South Carolina	17
Paratyphoid fever:	
South Carolina	12
Wisconsin	7
Plague:	
Hawaii Territory	2
Puerperal septicemia:	
Delaware	1
Rabies in animals:	
Idaho	3
Rocky Mountain spotted (or tick) fever:	
Idaho	6
Montana	7
Tetanus:	
Hawaii Territory	2
Trachoma:	
Hawaii Territory	4
Montana	11
Wisconsin	1
Tularaemia:	
Montana	2
Vincent's angina:	
South Carolina	4
Whooping cough:	
Delaware	3
Hawaii Territory	6
Whooping cough—Continued.	
Idaho	4
Montana	8
South Carolina	298
Wisconsin	348

July, 1928

	Cases
Chicken pox:	
Connecticut	54
Nebraska	14
North Dakota	38
Tennessee	22
Vermont	47
Dengue:	
Tennessee	1
Dysentery:	
Arizona (amebic)	1
Connecticut (amebic)	1
Tennessee	98
German measles:	
Connecticut	15
Nebraska	1
Lead poisoning:	
Connecticut	1
Lethargic encephalitis:	
Connecticut	2
North Dakota	1
Tennessee	2
Mumps:	
Arizona	2
Connecticut	110
Nebraska	17
North Dakota	7
Tennessee	55
Vermont	33
Ophthalmia neonatorum:	
Tennessee	4
Paratyphoid fever:	
Connecticut	3
Tennessee	3
Puerperal septicemia:	
Tennessee	1
Rabies in animals:	
Connecticut	1
Septic sore throat:	
Connecticut	13
Tennessee	5
Tetanus:	
Connecticut	3
Tennessee	1
Trachoma:	
Arizona	9
North Dakota	2
Tennessee	8
Tularaemia:	
North Dakota	1
Tennessee	1
Undulant (malta) fever:	
Arizona	2
Connecticut	1
Vincent's angina:	
North Dakota	9
Whooping cough:	
Arizona	3
Connecticut	353
Nebraska	42
North Dakota	34
Tennessee	69
Vermont	126

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 97 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 30,540,000. The estimated population of the 93 cities reporting deaths is more than 30,345,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended August 4, 1928, and August 6, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
42 States	775	934	
97 cities	379	458	486
Measles:			
41 States	1,835	1,319	
97 cities	576	249	
Poliomyelitis, 43 States	186	147	
Scarlet fever:			
42 States	897	1,008	
97 cities	279	299	270
Smallpox:			
43 States	175	205	
97 cities	20	26	24
Typhoid fever:			
42 States	821	1,042	
97 cities	126	126	166
Deaths reported			
Influenza and pneumonia, 93 cities	338	274	
Smallpox, 93 cities	0	0	

City reports for week ended August 4, 1928

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

If the reports have not been received for the full nine years, data are used for as many years as possible but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population, July 1, 1926, 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	76,400	0	1	0	0	0	2	0	2
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	0
Manchester	84,000	0	1	0	0	0	0	0	1
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	787,000	3	29	8	1	1	9	0	13
Fall River	131,000	0	2	0	0	0	15	0	2
Springfield	145,000	0	1	1	0	0	4	4	0
Worcester	193,000	0	2	4	1	0	4	5	1
Rhode Island:									
Pawtucket	71,000	0	1	0	0	0	0	0	2
Providence	275,000	0	4	6	0	0	175	0	2
Connecticut:									
Bridgeport	(2)	0	4	0	0	0	2	0	2
Hartford	164,000	0	2	6	0	0	14	1	1
New Haven	182,000	0	1	0	0	0	4	0	0
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	3	8	4		0	3	6	11
New York	5,924,000	24	116	93	3	8	96	8	72
Rochester	321,000	2	4	4		0	10	4	0
Syracuse	185,000	9	2	3		0	3	2	2
New Jersey:									
Camden	131,000	0	3	0	0	0	4	2	0
Newark	459,000	0	7	9	1	1	9	0	7
Trenton	134,000	4	1	1	0	0	2	0	2
Pennsylvania:									
Philadelphia	2,008,000	7	36	17	0	2	24	3	21
Pittsburgh	637,000	9	12	5	0	2	8	2	8
Reading	114,000	0	2	1	0	0	2	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	1	4	2	0	1	2	0	4
Cleveland	960,000	17	19	6	1	0	51	1	8
Columbus	285,000	0	2	0	0	0	16	0	2
Toledo	295,000	4	4	0	0	0	8	2	3
Indiana:									
Fort Wayne	99,900	0	1	2	0	0	1	0	1
Indianapolis	367,000	3	3	1	0	0	12	4	3
South Bend	81,700	0	1	0	0	0	0	0	1
Terre Haute	71,900	0	1	0	0	0	0	0	2
Illinois:									
Chicago	3,048,000	39	46	59	3	0	14	5	14
Springfield	64,700	0	0	0	2	2	0	3	0
Michigan:									
Detroit	[3] 1,242,044	8	27	29	3	1	16	3	7
Flint	136,000	3	3	2	0	0	4	1	1
Grand Rapids	156,000	0	1	1	0	1	6	1	1
Wisconsin:									
Kenosha	52,700	0	0	0	0	0	0	0	0
Milwaukee	517,000	15	8	4	0	0	5	2	2
Racine	69,400	0	1	1	0	0	1	0	1
Superior	[1] 39,671	0	1	4	0	0	0	0	0

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census.

City reports for week ended August 4, 1928—Continued

Division, State, and city	Population, July 1, 1926, 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			
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	0	0	0	0	0	0	0	0
Minneapolis	434,000	6	10	13	0	1	0	1	4
St. Paul	248,000	1	8	0	0	0	0	0	6
Iowa:									
Des Moines	146,000	0	1	0	0	-------	0	0	-------
Sioux City	78,000	2	0	1	0	-------	0	0	-------
Waterloo	36,900	2	0	0	0	-------	0	3	-------
Missouri:									
Kansas City	375,000	-------	2	-------	-------	-------	-------	-------	-------
St. Joseph	78,400	0	1	1	0	0	0	0	0
St. Louis	830,000	4	18	16	1	0	2	3	-------
North Dakota:									
Fargo	[1] 26,403	0	0	0	0	0	0	0	0
Grand Forks	[1] 14,811	0	0	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	[1] 15,036	0	0	0	0	-------	0	0	-------
Nebraska:									
Lincoln	62,000	1	1	0	0	0	1	3	0
Omaha	216,000	0	2	2	0	0	0	0	4
Kansas:									
Topeka	56,500	0	0	1	0	0	1	0	1
Wichita	92,500	0	1	0	0	0	0	0	3
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	0	1	2	0	0	6	0	3
Maryland:									
Baltimore	808,000	6	12	6	0	3	4	4	6
Cumberland	[1] 33,741	0	0	0	0	0	0	0	0
Frederick	[1] 12,035	0	0	0	0	0	0	0	0
District of Columbia:									
Washington	528,000	0	5	13	0	0	19	0	8
Virginia:									
Lynchburg	[3] 38,493	1	0	0	0	0	1	2	0
Norfolk	174,000	0	0	0	0	0	1	0	1
Richmond	189,000	0	3	1	0	0	0	0	2
Roanoke	61,900	0	1	0	0	0	0	0	0
West Virginia:									
Charleston	50,700	0	0	0	0	0	0	0	1
Wheeling	[1] 56,208	0	1	0	0	0	0	0	0
North Carolina:									
Raleigh	[1] 30,371	0	0	0	0	0	1	0	0
Wilmington	37,700	0	0	0	0	0	0	0	0
Winston-Salem	71,800	1	1	0	0	0	0	3	0
South Carolina:									
Charleston	74,100	0	0	1	18	0	0	0	3
Columbia	41,800	0	0	1	0	0	0	3	1
Greenville	[1] 27,311	1	0	0	0	0	0	0	0
Georgia:									
Atlanta	(2)	0	1	0	4	0	0	0	2
Brunswick	[1] 16,809	0	0	0	0	0	0	0	0
Savannah	94,900	0	1	3	0	0	0	0	0
Florida:									
Miami	[3] 131,286	0	2	1	0	0	0	1	1
St. Petersburg	47,629	-------	0	-------	-------	0	-------	-------	6
Tampa	102,000	0	0	2	15	5	0	0	1
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	0	1	0	0	0	0	0	1
Louisville	311,000	0	2	3	0	0	0	0	8
Tennessee:									
Memphis	177,000	0	2	0	0	0	0	0	1
Nashville	137,000	0	1	1	0	0	3	0	2
Alabama:									
Birmingham	211,000	-------	1	-------	-------	-------	-------	-------	-------
Mobile	66,800	0	0	0	1	0	0	0	0
Montgomery	47,000	0	0	0	0	-------	0	0	-------

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census.

City reports for week ended August 4, 1928—Continued

Division, State, and city	Population, July 1, 1926, 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			
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	1	0	0	0	--------	0	0	--------
Little Rock	75,900	0	0	0	0	0	0	1	1
Louisiana:									
New Orleans	419,000	0	4	6	1	2	0	0	1
Shreveport	59,500	0	0	0	0	0	0	0	3
Oklahoma:									
Oklahoma City	(2)	0	1	1	2	0	1	0	1
Tulsa	133,000	0	0	0	0	--------	1	0	--------
Texas:									
Dallas	203,000	0	3	2	1	1	0	0	1
Fort Worth	159,000	0	3	1	0	0	0	0	0
Galveston	49,100	0	0	0	0	0	0	0	2
Houston	[1] 164,954	0	2	1	0	0	0	0	4
San Antonio	205,000	0	1	1	0	0	0	0	3
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	1	0	1
Great Falls	[1] 29,883	0	0	0	0	0	2	0	0
Helena	[1] 12,037	0	0	0	0	0	0	0	0
Missoula	[1] 12,668	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	1	0	0	0	0	0	0	0
Colorado:									
Denver	285,000	1	9	4	--------	0	8	10	5
Pueblo	43,900	1	0	0	0	0	0	0	0
New Mexico:									
Albuquerque	[1] 21,000	0	0	0	0	0	0	0	0
Utah:									
Salt Lake City	133,000	7	2	0	0	0	0	0	1
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	--------	3	--------	--------	--------	--------	--------	--------
Spokane	109,000	--------	1	--------	--------	--------	--------	--------	--------
Tacoma	106,000	2	2	1	0	0	1	11	1
California:									
Los Angeles	(2)	12	27	16	6	3	4	11	14
Sacramento	73,400	0	1	3	0	0	2	0	2
San Francisco	567,000	7	9	5	0	0	2	1	6

[1] Estimated, July 1, 1925. [2] No estimate made.

City reports for week ended August 4, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
NEW ENGLAND											
Maine:											
Portland	1	2	0	0	0	0	1	1	0	0	23
New Hampshire:											
Concord	1	0	0	0	0	0	0	0	0	0	8
Manchester	0	1	0	0	0	1	0	0	0	0	15
Vermont:											
Barre	0	0	0	0	0	2	0	0	0	0	5
Massachusetts:											
Boston	17	12	0	0	0	4	3	1	1	27	167
Fall River	1	1	0	0	0	1	0	0	0	4	16
Springfield	1	3	0	0	0	1	0	0	0	0	23
Worcester	2	1	0	0	0	2	0	0	0	2	51
Rhode Island:											
Pawtucket	0	0	0	0	0	2	0	0	0	3	16
Providence	2	4	0	0	0	2	1	0	0	0	62
Connecticut:											
Bridgeport	2	0	0	0	0	1	0	0	0	6	25
Hartford	2	0	0	0	0	1	1	0	0	8	24
New Haven	1	0	0	0	0	1	1	0	0	12	33
MIDDLE ATLANTIC											
New York:											
Buffalo	5	7	0	0	0	8	0	0	0	79	121
New York	34	30	0	0	0	94	28	19	4	107	1,145
Rochester	3	1	0	0	0	3	1	1	0	5	60
Syracuse	3	0	0	0	0	2	0	0	0	9	41
New Jersey:											
Camden	1	1	0	0	0	0	2	1	1	7	21
Newark	4	0	0	0	0	8	1	0	0	32	100
Trenton	0	0	0	0	0	4	1	1	0	1	39
Pennsylvania:											
Philadelphia	19	10	0	0	0	29	10	3	0	93	413
Pittsburgh	9	8	1	0	0	10	2	10	0	25	139
Reading	0	0	0	0	0	0	1	0	0	14	15
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	4	6	0	0	0	11	2	0	0	12	133
Cleveland	11	7	1	0	0	14	3	3	0	56	172
Columbus	2	0	0	1	0	6	1	1	1	12	79
Toledo	3	1	1	0	0	10	2	2	1	25	74
Indiana:											
Fort Wayne	1	0	0	0	0	1	0	1	0	1	23
Indianapolis	2	2	1	4	0	5	3	0	0	1	70
South Bend	1	0	0	0	0	1	0	0	0	1	16
Terre Haute	0	1	0	1	0	0	0	0	0	0	19
Illinois:											
Chicago	28	22	0	0	0	49	5	5	0	107	554
Springfield	1	2	0	2	0	0	0	0	0	5	18
Michigan:											
Detroit	23	30	2	0	0	22	5	4	1	190	244
Flint	3	3	1	2	0	0	0	0	0	3	29
Grand Rapids	2	0	0	0	0	1	0	0	0	8	30
Wisconsin:											
Kenosha	1	0	0	0	0	0	0	0	0	4	5
Milwaukee	6	9	1	0	0	7	1	1	0	78	111
Racine	1	2	0	0	0	1	0	0	0	6	10
Superior	1	4	1	0	0	1	0	0	0	0	8
WEST NORTH CENTRAL											
Minnesota:											
Duluth	4	3	1	0	0	1	0	0	0	1	18
Minneapolis	12	9	2	0	0	3	1	0	0	0	81
St. Paul	6	6	2	0	0	4	3	0	0	29	56
Iowa:											
Des Moines	2	1	0	0	--------	--------	0	0	--------	0	31
Sioux City	0	1	0	0	--------	--------	0	0	--------	3	--------
Waterloo	0	1	0	0	--------	--------	0	0	--------	2	--------

City reports for week ended August 4, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST NORTH CENTRAL—continued											
Missouri:											
Kansas City	2	-------	0	-------	-------	-------	3	-------	-------	-------	-------
St. Joseph	0	0	0	0	0	0	0	0	0	0	27
St. Louis	6	6	0	0	0	4	6	3	0	19	163
North Dakota:											
Fargo	0	1	0	0	0	0	0	0	0	1	12
Grand Forks	0	0	-------	0	-------	-------	-------	0	-------	0	-------
South Dakota:											
Aberdeen	0	0	0	0	-------	-------	0	0	-------	1	-------
Nebraska:											
Lincoln	0	2	0	1	0	0	0	0	0	5	18
Omaha	1	1	0	0	0	2	0	1	0	0	55
Kansas:											
Topeka	1	1	0	0	0	0	1	0	0	3	13
Wichita	1	4	0	0	0	3	1	0	0	1	83
SOUTH ATLANTIC											
Delaware:											
Wilmington	0	0	0	0	0	1	0	0	0	7	29
Maryland:											
Baltimore	5	7	0	0	0	15	9	9	1	116	182
Cumberland	0	0	0	0	0	0	0	0	0	0	12
Frederick	0	0	0	0	0	0	0	0	0	0	3
District of Columbia:											
Washington	3	5	1	0	0	5	4	0	0	7	137
Virginia:											
Lynchburg	0	0	0	0	0	0	4	4	0	4	8
Norfolk	0	3	0	0	0	3	3	3	0	2	-------
Richmond	2	2	0	0	0	1	2	1	0	4	50
Roanoke	1	1	1	0	0	0	0	1	0	0	9
West Virginia:											
Charleston	1	0	0	0	0	1	0	1	0	0	9
Wheeling	1	1	0	0	0	0	0	0	0	3	11
North Carolina:											
Raleigh	0	1	0	0	0	0	1	0	0	4	12
Wilmington	0	0	0	0	0	1	0	0	1	0	8
Winston-Salem	1	0	0	0	0	2	1	3	0	0	21
South Carolina:											
Charleston	1	0	0	0	0	2	1	0	0	0	24
Columbia	0	0	0	0	0	2	2	0	0	0	13
Greenville	0	1	0	0	0	2	1	0	2	0	9
Georgia:											
Atlanta	2	0	1	1	0	3	3	2	0	4	82
Brunswick	0	0	0	0	0	0	0	0	0	0	4
Savannah	0	1	0	0	0	7	1	1	1	0	44
Florida:											
Miami	1	0	0	0	0	0	1	0	0	0	12
St. Petersburg	0	-------	0	-------	0	0	0	-------	0	-------	6
Tampa	0	2	0	0	0	2	0	0	0	0	35
EAST SOUTH CENTRAL											
Kentucky:											
Covington	0	1	0	2	0	3	0	0	0	0	23
Louisville	0	8	0	0	0	5	5	2	0	0	90
Tennessee:											
Memphis	1	1	0	0	0	2	8	11	0	4	72
Nashville	0	2	1	0	0	5	6	4	1	0	59
Alabama:											
Birmingham	2	-------	1	-------	-------	-------	5	-------	-------	-------	-------
Mobile	0	0	0	0	0	1	1	2	0	0	18
Montgomery	0	0	0	0	-------	-------	2	3	-------	0	-------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	1	0	0	-------	-------	0	0	-------	2	-------
Little Rock	0	0	0	0	0	0	2	1	0	0	-------
Louisiana:											
New Orleans	2	7	1	0	0	7	4	5	4	3	135
Shreveport	0	2	0	0	0	1	1	2	0	3	35

City reports for week ended August 4, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST SOUTH CENTRAL—continued											
Oklahoma:											
Oklahoma City	0	0	1	0	0	2	3	0	1	0	36
Tulsa	0	0	0	0	------	------	4	0	------	0	------
Texas:											
Dallas	2	7	1	0	0	1	4	5	0	12	45
Fort Worth	1	0	1	0	0	1	1	3	0	0	36
Galveston	0	1	0	0	0	1	0	0	0	0	10
Houston	1	0	0	0	0	3	2	2	1	0	54
San Antonio	0	1	0	0	0	8	2	0	1	0	62
MOUNTAIN											
Montana:											
Billings	0	0	0	4	0	0	0	0	0	1	11
Great Falls	0	0	1	0	0	0	0	0	0	0	10
Helena	0	0	0	0	0	0	0	0	0	0	6
Missoula	0	0	0	0	0	0	0	0	0	0	5
Idaho:											
Boise	0	1	0	0	0	0	0	0	0	1	4
Colorado:											
Denver	3	1	0	0	0	7	2	0	0	37	73
Pueblo	1	0	0	0	0	1	0	0	0	0	8
New Mexico:											
Albuquerque	0	0	0	0	0	4	0	0	0	0	14
Utah:											
Salt Lake City	1	1	0	0	0	1	2	0	0	10	34
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	3
PACIFIC											
Washington:											
Seattle	2	------	1	------	------	------	1	------	------	------	------
Spokane	2	------	2	------	------	------	0	------	------	------	------
Tacoma	1	1	1	2	0	0	1	1	0	0	20
California:											
Los Angeles	9	10	4	0	0	17	4	1	0	53	181
Sacramento	1	3	0	0	0	1	1	0	0	2	20
San Francisco	5	6	1	1	0	4	2	6	2	6	139

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
New Hampshire:									
Concord	0	0	0	0	0	0	0	1	1
Massachusetts:									
Boston	0	0	1	0	0	0	2	0	0
Fall River	0	0	0	0	0	0	0	1	0
Worchester	0	0	0	0	0	0	1	1	1
MIDDLE ATLANTIC									
New York:									
New York	14	8	4	3	0	0	6	41	12
Syracuse	0	0	0	0	0	0	0	2	0
New Jersey:									
Newark	0	0	0	0	0	0	1	2	0
Pennsylvania:									
Philadelphia	1	1	1	0	0	0	1	0	0
Pittsburgh	0	1	0	0	0	0	1	0	0

City reports for week ended August 4, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cleveland	0	0	0	0	0	0	0	1	0
Columbus	0	0	0	0	0	0	0	1	0
Indiana:									
Indianapolis	0	1	0	0	0	0	0	0	0
Illinois:									
Chicago	4	1	1	0	0	0	2	0	0
Michigan:									
Detroit	5	1	0	0	0	0	0	0	0
Flint	1	0	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee	0	0	0	0	0	0	1	1	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	2	0	0	0	0	0	0	0	0
Minneapolis	1	0	0	0	0	0	0	1	0
Missouri:									
St. Louis	3	2	1	0	0	0	1	0	0
North Dakota:									
Fargo	1	1	1	1	0	0	0	0	0
Nebraska:									
Omaha [1]	1	0	0	0	0	0	1	0	0
SOUTH ATLANTIC [3]									
Maryland:									
Baltimore	1	0	0	0	0	0	1	3	0
District of Columbia:									
Washington	0	0	1	1	0	0	0	1	0
North Carolina:									
Raleigh	0	0	0	0	0	1	0	0	0
South Carolina:									
Charleston [2]	0	0	0	0	1	1	0	0	0
Georgia:									
Atlanta	0	0	0	0	3	0	0	0	0
Brunswick	0	0	0	0	0	1	0	0	0
Savannah [3]	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Kentucky:									
Louisville	1	0	0	0	0	0	0	0	0
Tennessee:									
Memphis	0	0	0	1	1	0	0	0	0
Alabama:									
Montgomery	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	0	0	0	0	3	0	0	0	0
Shreveport	0	0	0	0	0	3	0	0	0
Oklahoma:									
Oklahoma City	1	0	0	0	2	0	0	0	0
Tulsa	1	1	0	0	0	0	0	0	0
Texas:									
Fort Worth	0	0	0	0	0	1	0	0	0
Houston	0	0	0	0	0	1	0	0	0
MOUNTAIN									
Montana:									
Billings	0	0	0	0	0	0	0	1	0
Great Falls	1	1	0	0	0	0	0	0	0
Colorado:									
Denver	1	0	0	0	0	0	0	0	0
Nevada:									
Reno	1	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Tacoma	0	0	0	0	0	0	0	1	0
California:									
Los Angeles	0	1	0	0	1	1	1	2	1
Sacramento	1	0	0	0	0	0	1	0	0

[1] Rabies (in man); 2 deaths at Omaha, Nebr.
[2] Dengue: 1 case at Charleston, S. C.
[3] Typhus fever: 3 cases—1 at Savannah, Ga., and 2 at Tampa, Fla.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended August 4, 1928, compared with those for a like period ended August 6, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1928 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,657,000 in 1928 and 31,050,000 in 1927. The 95 cities reporting deaths had nearly 30,961,000 estimated population in 1928 and nearly 30,370,000 in 1927. 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, July 1 to August 4, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	July 7, 1928	July 9, 1927	July 14, 1928	July 16, 1927	July 21, 1928	July 23, 1927	July 28, 1928	July 30, 1927	Aug. 4, 1928	Aug. 6, 1927
101 cities	86	121	83	114	69	[2] 92	[3] 68	[4] 94	[5] 65	78
New England	62	91	80	133	46	63	46	91	57	63
Middle Atlantic	147	196	116	164	90	105	[6] 83	103	67	92
East North Central	79	102	82	93	77	108	64	102	73	80
West North Central	29	38	53	53	53	53	58	55	[7] 78	42
South Atlantic	51	85	58	83	46	[2] 87	[8] 63	88	51	65
East South Central	15	41	5	35	25	25	50	30	[9] 25	30
West South Central	16	50	40	70	56	124	68	70	40	91
Mountain	27	108	71	81	35	99	62	117	35	134
Pacific	49	86	72	112	54	65	[4] 57	[4] 121	[4] 84	76

MEASLES CASE RATES

	July 7, 1928	July 9, 1927	July 14, 1928	July 16, 1927	July 21, 1928	July 23, 1927	July 28, 1928	July 30, 1927	Aug. 4, 1928	Aug. 6, 1927
101 cities	322	198	264	154	163	[2] 108	[3] 130	[4] 58	[5] 99	48
New England	722	300	777	242	503	198	651	170	526	93
Middle Atlantic	455	154	349	122	203	92	[6] 129	45	78	43
East North Central	266	182	215	110	145	90	83	47	84	29
West North Central	171	93	117	105	62	48	29	40	[7] 7	34
South Atlantic	235	276	124	220	89	[2] 140	[8] 72	69	56	38
East South Central	65	76	200	61	80	25	80	46	[9] 19	10
West South Central	20	112	24	103	4	54	0	58	0	54
Mountain	354	134	239	170	186	99	80	63	97	45
Pacific	38	538	26	447	20	279	[4] 54	[4] 66	[4] 30	144

SCARLET FEVER CASE RATES

	July 7, 1928	July 9, 1927	July 14, 1928	July 16, 1927	July 21, 1928	July 23, 1927	July 28, 1928	July 30, 1927	Aug. 4, 1928	Aug. 6, 1927
101 cities	74	99	52	84	56	[2] 64	[3] 42	[4] 63	[5] 48	51
New England	122	174	87	130	78	100	57	107	53	51
Middle Atlantic	58	123	37	91	33	50	[6] 25	39	28	35
East North Central	96	91	71	89	88	75	56	87	58	75
West North Central	90	91	35	71	72	79	60	79	[7] 75	61
South Atlantic	60	54	35	56	28	[2] 40	[8] 36	40	42	27
East South Central	75	46	55	30	45	30	30	41	[9] 76	51
West South Central	36	41	28	37	32	45	20	25	76	25
Mountain	27	117	62	224	44	99	27	152	27	126
Pacific	61	60	74	50	79	91	[4] 71	[4] 66	[4] 68	60

[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, 1928, and 1927, respectively.
[2] Norfolk, Va., not included.
[3] Buffalo, N. Y., Winston-Salem, N. C., Seattle, Wash., and Spokane, Wash., not included.
[4] Seattle, Wash., and Spokane, Wash., not included.
[5] Kansas City, Mo., Birmingham, Ala., Seattle, Wash., and Spokane, Wash., not included.
[6] Buffalo, N. Y., not included.
[7] Kansas City, Mo., not included.
[8] Winston-Salem, N. C., not included.
[9] Birmingham, Ala., not included.

Summary of weekly reports from cities, July 1 to August 4, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

SMALLPOX CASE RATES

	Week ended—									
	July 7, 1928	July 9, 1927	July 14, 1928	July 16, 1927	July 21, 1928	July 23, 1927	July 28, 1928	July 30, 1927	Aug. 4, 1928	Aug. 6, 1927
101 cities	6	16	7	9	4	[2] 10	[3] 2	[4] 5	[5] 3	6
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	[6] 0	0	0	0
East North Central	6	15	7	17	3	13	1	9	7	9
West North Central	16	34	12	14	14	12	4	6	[7] 0	0
South Atlantic	7	23	0	9	5	[2] 12	[8] 0	4	2	9
East South Central	5	51	5	25	10	35	25	10	[9] 13	5
West South Central	4	0	4	8	4	8	0	12	0	17
Mountain	44	45	88	36	18	117	18	27	35	18
Pacific	15	73	31	13	10	21	[4] 3	[4] 10	[4] 10	21

TYPHOID FEVER CASE RATES

	July 7, 1928	July 9, 1927	July 14, 1928	July 16, 1927	July 21, 1928	July 23, 1927	July 28, 1928	July 30, 1927	Aug. 4, 1928	Aug. 6, 1927
101 cities	14	16	18	21	18	[2] 20	[3] 23	[4] 21	[5] 22	25
New England	9	14	14	19	7	16	11	9	5	7
Middle Atlantic	9	8	9	11	12	8	[6] 17	13	17	13
East North Central	4	5	11	8	7	9	5	11	10	9
West North Central	8	10	16	16	12	14	23	16	[7] 9	26
South Atlantic	19	34	32	43	30	[2] 50	[8] 31	36	44	58
East South Central	70	162	60	152	100	122	120	117	[9] 140	183
West South Central	64	17	64	74	88	54	104	54	60	50
Mountain	9	18	9	27	0	27	27	72	0	45
Pacific	26	10	23	8	18	16	[4] 17	[4] 24	[4] 27	13

INFLUENZA DEATH RATES

	July 7, 1928	July 9, 1927	July 14, 1928	July 16, 1927	July 21, 1928	July 23, 1927	July 28, 1928	July 30, 1927	Aug. 4, 1928	Aug. 6, 1927
95 cities	8	3	5	3	5	[2] 3	[10] 4	3	[11] 6	2
New England	9	2	5	5	9	0	5	2	2	0
Middle Atlantic	10	4	3	2	4	4	[6] 2	4	6	1
East North Central	3	3	4	1	5	2	6	1	3	0
West North Central	8	0	4	2	2	2	2	0	[7] 2	2
South Atlantic	5	4	7	5	7	[2] 2	[8] 5	2	14	5
East South Central	21	16	5	5	0	16	16	11	[9] 0	5
West South Central	25	0	25	8	4	0	12	8	12	4
Mountain	18	0	18	9	9	9	9	0	0	9
Pacific	0	3	10	7	3	3	0	3	10	3

PNEUMONIA DEATH RATES

	July 7, 1928	July 9, 1927	July 14, 1928	July 16, 1927	July 21, 1928	July 23, 1927	July 28, 1928	July 30, 1927	Aug. 4, 1928	Aug. 6, 1927
95 cities	70	59	60	56	56	[2] 56	[10] 44	49	[11] 52	47
New England	51	60	67	56	55	56	34	49	57	33
Middle Atlantic	89	63	72	61	60	59	[6] 53	56	60	46
East North Central	67	49	54	45	57	55	29	42	31	44
West North Central	37	54	26	31	26	21	20	17	[7] 43	43
South Atlantic	56	58	49	61	51	[2] 73	[8] 67	43	49	52
East South Central	68	85	78	69	52	48	105	48	[9] 81	53
West South Central	57	64	70	68	53	64	57	85	86	68
Mountain	53	99	62	63	80	45	80	36	62	54
Pacific	78	55	54	97	81	72	10	79	78	62

[2] Norfolk, Va., not included.
[3] Buffalo, N. Y., Winston-Salem, N. C., Seattle, Wash., and Spokane, Wash., not included.
[4] Seattle, Wash., and Spokane, Wash., not included.
[5] Kansas City, Mo., Birmingham, Ala., Seattle, Wash., and Spokane, Wash., not included.
[6] Buffalo, N. Y., not included.
[7] Kansas City, Mo., not included.
[8] Winston-Salem, N. C., not included.
[9] Birmingham, Ala., not included.
[10] Buffalo, N. Y., and Winston-Salem, N. C., not included.
[11] Kansas City, Mo., and Birmingham, Ala., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities of each group, approximated as of July 1, 1928 and 1927, respectively

Groups of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31,657,000	31,050,300	30,960,700	30,369,500
New England	12	12	2,274,400	2,242,700	2,274,400	2,242,700
Middle Atlantic	10	10	10,732,400	10,594,700	10,732,400	10,594,700
East North Central	16	16	7,991,400	7,820,700	7,991,400	7,820,700
West North Central	12	10	2,683,500	2,634,500	2,566,400	2,518,500
South Atlantic	21	21	2,981,900	2,890,700	2,981,900	2,890,700
East South Central	7	6	1,048,300	1,028,300	1,000,100	980,700
West South Central	8	7	1,307,600	1,260,700	1,274,100	1,227,800
Mountain	9	9	591,100	581,600	591,100	581,600
Pacific	6	4	2,046,400	1,996,400	1,548,900	1,512,100

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended July 28, 1928.—The following report for the week ended July 28, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations located at Singapore, to the headquarters at Geneva:

Plague, cholera, or smallpox was reported in the following ports:

PLAGUE

Madagascar.—Tamatave.
Iraq.—Baghdad.
India.—Bombay, Rangoon, Cochin.
China.—Hong Kong.

CHOLERA

India.—Bombay, Calcutta, Madras, Vizagapatam.
French India.—Pondicherry.
Siam.—Bangkok.
Indo-China.—Pnompenh.
China.—Canton, Shanghai.

SMALLPOX

India.—Bombay, Calcutta, Madras, Rangoon, Negapatam, Moulmein, Karachi.
French India.—Pondicherry.
Dutch East Indies.—Belawan Deli, Pontianak, Samarinda.
China.—Hong Kong.
Kwangtung.—Dairen.
Manchuria.—Changchun.

ALASKA

Nome—Suspected smallpox—August, 1928.—An epidemic of a disease which may be smallpox was reported August 11, 1928, among natives at Nome, Alaska.

CANADA

Provinces—Communicable diseases—Week ended July 28, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended July 28, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever				1	1			2
Influenza	9							9
Poliomyelitis			1		5			6
Smallpox			13	5	4		2	24
Typhoid fever		1	7	4		1		13

Quebec Province—Communicable diseases—Week ended August 4, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended August 4, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	8	Scarlet fever	24
Diphtheria	32	Smallpox	5
Measles	4	Tuberculosis	40
Mumps	4	Typhoid fever	22
Poliomyelitis	1	Whooping cough	2

Ontario Province—Communicable diseases—Comparative—Four weeks ended July 28, 1928.—The Provincial Board of Health of Ontario, Canada, report cases and deaths from communicable diseases for the four weeks ended July 28, 1928, and the corresponding period in 1927, as follows:

Disease	July 1-28, 1928		July 3-30, 1927	
	Cases	Deaths	Cases	Deaths
Actinomycosis			1	
Cerebrospinal meningitis	5	4	2	2
Chancroid	1		7	
Chicken pox	398	1	550	
Conjunctivitis, acute, infectious	1			
Diphtheria	155	8	194	18
Dysentery	1	1		2
Erysipelas			2	
German measles	4		126	0
Gonorrhea	129		130	
Influenza		9		4
Lethargic encephalitis		1	3	2
Measles	903		915	
Mumps	295		112	
Pellagra				1
Pneumonia		68		104
Poliomyelitis	3		3	1
Puerperal septicemia		1		
Scarlet fever	148	1	240	3
Septic sore throat			1	
Smallpox	18		97	
Syphilis	72	1	89	3
Tuberculosis	123	41	135	76
Typhoid fever	48	4	84	2
Undulant (Malta) fever	1			
Whooping cough	218	3	310	6

YUGOSLAVIA

Communicable diseases—June, 1928.—During the month of June, 1928, communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	31	6	Rabies	1	1
Cerebrospinal meningitis	11	7	Scarlet fever	984	151
Diphtheria	173	32	Tetanus	38	16
Dysentery	36	1	Typhoid fever	145	16
Leprosy	1		Typhus fever	16	1
Measles	1,286	30			

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

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

CHOLERA

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928		
							9	16	23	30	7	14	21	28	4	11	18
Ceylon: Colombo	C										1						
	D										1						
China:																	
Canton	C			2		1	1			1		2	1	3			
	D			2		1	1			1		2	1	3			
Shanghai	C																P
Swatow	C									3							
India	C	12,391	13,236	21,279	32,564	30,177	7,479	8,174	8,028								
	D	6,750	7,282	11,877	20,432	20,162	5,361	5,355	5,054								
Bassein	D	1	2	51	41	40		8									
Bombay	C	1	1	3		1					4		2				
	D		1	3							3		2	6			
Calcutta	C	203	341	664	446	552	135	133	119	75	65						
	D	112	241	442	428	410	83	85	97	58	45	42	26	20			
Madras	C	2	14	10	22	27		3	14	12	13	4					
	D	4	18	4	18	16	6	1	5	9	5	3	6	17			
Madras Presidency	C	4,681	2,961	1,483		1,314	978										
	D	2,660	1,618	812		675	460										
Negapatam	C	4	4														
	D	6	4		2					13							
Rangoon	C	6	29	22	23	7	8	2	4				1				
	D	2	18	16	15	5	5	2	2								
Tuticorin	C			10	110												
	D			9	71												
Vizagapatam	D											4	1	2			
India (French):																	
Chandernagor	C	6	5	7													
	D	1	5	6													
Karikal	C	32	6		1												
	D	19	5		1												
Pondicherry	C	12	33	1	8							1		2			
	D	10	19	1	8							1		2			

Indo-China (see also table below):																	
Pnompenh	C										1	2	1	1			
	D										1	2	1				
Saigon	C	4	16	96	116	15	5	1					2				
	D	1	8	59	76	9	1						1				
Tourane	C							1									
	D							1									
Kwangchow-Wan (see table below).																	
Persian Gulf:																	
Island of Henjam	C												1				
Jask	C													1			
Philippine Islands:																	
Cebu port	C													1			
Manila	C											4			1		
Siam	C	200	205	291	349	202	51	49	43	60	58	35	10	60			
	D	139	214	218	234	127	36	30	30	48	39	20	7	48			
Ayudhaya	C						2										
	D						1										
Bangkok	C	101	60	60	74	50	3	3	1		3	5	1				
	D	66	36	33	35	26		2	2			2	1				
Trad	C							1									
Straits Settlements: Singapore	C	3		2	1												
	D	1		2	1												
On vessel:																	
S. S. Hawaii Maru at Singapore from Saigon, French Indo-China	C			11													

Place		July-September, 1927	October-December, 1927	January-March, 1928	April, 1928			May, 1928			June, 1928			July, 1928	
					1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Indo-China (French) (see also table above):															
Annam	C	3,179	370	389	17	11	18	4	26	13	22	8	9	8	5
Cambodia	C	251	337	312	43	102	51	34	47	20	28	82	111	92	25
Cochin-China	C	469	391	1,407	277	316	240	140	139	125	143	109	77	65	55
Laos	C	246	77												
Tonkin	C	1,297	3	1	1	4	1	9	1	16	8	2	1	5	1
Kwangchow-Wan	C	16							16						

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

PLAGUE

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	Week ended— May, 1928			June, 1928					July, 1928				August, 1928	
						12	19	26	2	9	16	23	30	7	14	21	28	4	11
Algeria (see also table below):																			
Algiers	C				1														
Oran	C					1				2									
Arabia: Aden	C	178	343	651	224	5	1	1			1								
	D	104	206	529	191	7	1	1			1								
Plague-infected rats		P	P																
Argentina:																			
Avellaneda	C								1										
	D								1										
Buenos Aires	C	2					6					1							
	D						3				1		1						
Cordoba Province	C				5														
Entre Rios	C									2	1		2						
Loreto	C								3										
Rosario	C	4	1					1						1					
Santa Fe	C									7	1	1		1					
Santiago del Estero	C		1							9	1			1					
Suardi	C								2										
Azores: St. Michaels Island	C	8	3	3	5		1			1									
	D	4	1	2	2		1			1									
Bolivia: Valle Grande	C																	P	
Brazil:																			
Bahia	C	5	8	2	3		1		1										
	D	4	5				1												
Porto Alegre	C		1																
Rio de Janeiro	C	4	3	3															
	D	1	2	3															
Plague-infected rats		1																	
British East Africa (see also table below):																			
Tanganyiki	C	2	3																
	D	2	3		10									24					
Uganda	C	23	13					16	78	50		55							
	D	18	10					16	54	42		43							

Canary Islands:																			
Arrecife	C						1												
	D						1												
Lanzarote Village	C							1											
Las Palmas	C	1	1	4															
	D	1	1																
Tenerife	C		10																
	D		4																
Ceylon: Colombo	C	3	11	7	1	1	2		1	2									
	D	2	6	5	1	1	1			2									
Plague-infected rats		5	6																
China:																			
Amoy	C					1	1	2	1										
Hong Kong	C				2							1					1		
	D											1							
Dutch East Indies:																			
Celebes—Makassar	C	5	1																
	D	5	1																
Java	D	737	454																
Batavia and West Java	C	137	103	80	47	25	17	9	14	22	16	8	15						
	D	135	103	80	47	25	17	9	14	22	16	8	15						
Plague-infected rats				3	7	1	4	2	2	2	1		1			1	1		
East Java and Madura	C	7		4	4														
	D	7		4	4														
Kedoe Residency	C				4														
Surabaya Residency	C		1	1	1														
	D			1	1														
Ecuador (see also table below):																			
Alausi	C					1													
Egypt:																			
Alexandria	C	2	1					1						2				1	1
	D	2	1					2											
Assiout Province	C														1	1			
	D															1			
Beheira	C																	1	1
Beni-Souef	C				12	4	14	34	17	14	3	4	4	11	3	5	6	1	1
	D				3	4	6	8	5	7		2			1	1	3		
Maghagha District	C				1														
	D				1														
Menufia	C							6	5										
	D								2										
Minieh Province	C				48	13	15	36	12	22	23	21	10	1	11		1		
	D				9	5	2	9	1	9	5	7	8	1	2				
Port Said	C																1	1	
Sidi Barani	C													10	1		1	10	
	D														7		1	1	
Suez	C	4	13	14	5		1	2											
	D	2	9		18		1												
Plague-infected rats				2															
Tanta	C						1							1			1	1	1
	D						1												

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

PLAGUE—Continued

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	Week ended— May, 1928: 12	19	26	June, 1928: 2	9	16	23	30	July, 1928: 7	14	21	28	August, 1928: 4	11
Greece:																			
Corfu	C										1	14						1	
	D											3							
Patras	D														1		1		
Hawaii Territory: Hawaii:																			
Hamakua District—																			
Hamakua	D		1																
Plague-infected rats									1										
Honokaa—																			
Plague-infected rats									1										
Kukuihaele—																			
Plague-infected rats																1			
Paauilo	D																1		
India	C	12,652	23,174	26,079	18,518	1,582	820	616	254	127	79	90							
	D	8,521	16,998	20,907	17,074	1,504	805	633	241	143	77	74							
Bassein	D	8	12	22	13	2			1	12	1	1			1	2			
Bombay	C	14	33	69	43	17	14	3	5	8	3	3							
	D	9	33	61	69	17	14	1	6	5	1	2					1		
Calcutta	D	1		2															
Madras Presidency	C	452	271	62	21	1	3	1	7	4	6	29							
	D	256	212	48	12				6	1	2	15							
Rangoon	C	35	48	30	16	3	3	4	4	3	8	12	8	11					
	D	30	43	26	14	3	3	5	4	3	8	10	7		10	8			
Vizagapatam	D												1						
Indo-China (see also table below).																			
Pnompenh	C													3		1			
	D													3		1			
Saigon	C										5								
	D										1								
Plague-infected rats											2								
Iraq:																			
Baghdad	C	4	2	5	11	4	3	4	2	3	2	3	1				1		
	D	2	2	5	6		1	1	1	1	1	1	1						
Plague-infected rats					4	3													
Dulaim Liwa	C	1			1														

Kwangchow-Wan (see table below).																			
Madagascar (see also table below):																			
Tamatave	C						1			1	6	5	8	3					
	D										4		4	3					
Nigeria (see also table below):																			
Lagos	C	10	8	7	17	4	8	6	10	11	10	14	8	15	14	14	10		
	D	11	8	6	18	4	8	6	10	10	10	14	8	15	14	14	9		
Plague-infected rats					8	26	14		15	10	27	12	8						
Paragi..y: Asuncion	C										5								
	D										2			2					
Peru (see table below).																			
Portugal: Lisbon	C												1						
Senegal (see also table below):																			
Thies and vicinity	C			8					72	52									
	D			4					40	40									
Siam	C	20	42	33	27	3	6		6	1	3	2		2					
	D	12	36	30	13	2	5		4	2	2	3		2					
Ayudhaya	C									2				2					
	D									1				2					
Bangkok	C	2	1	1	4														
	D	2	1	1	2														
Nagara	C								1	2									
Straits Settlements: Singapore	C	1	3	1															
	D	1	2	1															
Syria (see also table below):																			
Beirut	C											1		2	1	1	1		
Tunisia: Bengardane region	C			8															
	D			6															
Turkey: Adalia	C																1		
Union of South Africa:																			
Cape Province	C	1																	
	D	1																	
Orange Free State	C	5	5	5															
	D	4	1	5															
Union of Soviet Socialist Republics: Astrakhan—Axary District	C										3								
	D										2								
Venezuela: State of Miranda—Tacata and Cua	C		P																
On vessel: S. S. Tymeric, at Barbados, from New Orleans	C							1											

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

PLAGUE—Continued

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

Place		October-December, 1927	January-March, 1928	April, 1928	May, 1928	June, 1928	July, 1928
Algeria (see also table above):							
Algiers	C	2			1		
Angola	C	3					
British East Africa (see also table above):							
Kenya	C	62	65	17	11	58	
	D			5			
Ecuador: Guayaquil	C	18	20		1	5	
	D	5	8			2	
Plague-infected rats		31	75		1	4	
Indo-China (see also table above)	C	10	12	9	16		
Kwangchow-Wan	C		18	17	10		
Madagascar (see also table above)	C	692	940	95		104	
	D	605	864	90		94	
Ambositra Province	C	25	202	25	13		
	D	17	191	25	10		
Antisirabe Province	C	109	281	35	14		
	D	108	279	34	14		
Itasy Province	C	104	55	1			
	D	94	49	1			
Moramanga Province	C	95	56				
	D	83	55				
Tananarivo Province	C	408	348	34		20	
	D	354	292	30		20	

Place		October-December, 1927	January-March, 1928	April, 1928	May, 1928	June, 1928	July, 1928
Nigeria (see also table above)	C	63	32				
	D	61	32				
Peru	C	34	93		20		
	D	11	23		4		
Callao	D	3					
Lima	C	7	6		4		
	D	3			2		
Senegal (see also table above)	C		30	81	216	151	
	D		17	40	115	91	
Rufisque	C				17	29	12
	D				9	22	5
Thies	C			30	72	243	103
	D			23	40	174	64
Tivaouane	C			51	105	169	84
	D			28	57	90	70
Syria: Beirut (see also table above)	C	2				1	4

PLAGUE RATS ON VESSELS

S. S. *Modemi* at Goteborg, Sweden, from Bahia and Buenos Aires via Cape Verde Islands, December 22, 1927
S. S. *Gydevore* at Landskrona, Sweden, from Rosario via Canary Islands, January 22, 1928.
S. S. *Dryden* at Liverpool from La Plata River ports, January 20, 1928.
S. S. *Sicily* at Liverpool from Buenos Aires and Rosario, June 8, 1928, 7 plague-infected rats.

SMALLPOX

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	Week ended— May, 1928 12	May 19	May 26	June, 1928 2	June 9	June 16	June 23	June 30	July, 1928 7	July 14	July 21	July 28	August, 1928 4	August 11
Algeria (see also table below)	C	71	72	3	12														
Algiers	C	15	10	5	4	1	1	3		1	7	4	3	1					
Oran	C	11	5	12	17	4	1				4								
Angola (see table below).																			
Arabia: Aden	C		1									1							
Brazil (see also table below):																			
Pernambuco	D							1											
Rio de Janeiro	C			1										1					
	D			1															
British East Africa (see also table below):																			
Kenya—Mombasa	C			2	1														
Tanganyiki	D	5																	
British South Africa:																			
Northern Rhodesia	C	233	297	67	628	5	3	148	39	5	3	6	1						
	D	23	42	9	51	1	1	14	1	1									
Southern Rhodesia	C	3	7	7	24	13					13	4	19				19		
	D		1		10								4				4		
Canada:																			
Alberta	C	27	27	47	12	13	12	18	1	4	1	1	3			1	2		
British Columbia—Vancouver	C	26	10	17	24	4	2	5		1	2	1		3	2	2	4		
Manitoba	C	1			7		1	3		10							5		
Winnipeg	C	2																	
New Brunswick	C		1				1				7							1	
Ontario	C	243	147	83	50	15	12	6	8	5	8	14	6			6	5		
Kingston	C	1			3											2			
Ottawa	C	68	22	26	4	4	2			1									
Toronto	C	20	14	9	11	2	7		3			3					1		
Quebec	C	26	54	112	83	13	31	15	19	21	14	14	32	21	16	12	13	5	
Montreal	C	8	9	9	9			1	2	3	2	3	3	3	1	1			
Quebec	C	16	13	10	23	7	17	9	14	17	11	10	14	21	9	7	7		
Sherbrooke	C			3							4								
Saskatchewan	C	97	22	33	52	12	13	3			4	3	9						
Moose Jaw	C	11	13	7	3		1							1					
Regina	C			3	8	1							1						
Saskatoon	C	15	2																
Ceylon: Colombo	C	4	6	1															
	D	1		1															

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

SMALLPOX—Continued

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	Week ended— May, 1928: 12	19	26	June, 1928: 2	9	16	23	30	July, 1928: 7	14	21	28	August, 1928: 4	11
China:																			
Amoy	C		1	6	9	1		1	1										
Antung	C				3														
Canton	C		2	7	2	1		1											
Chefoo	C			P					P		P								
	D		1																
Foochow	C	P	P	P	P								P						
Hong Kong	C	2	7	32	25	8	10	3	9	9	2	2	1	3	3	1	4		
	D	2	4	19	26	11	5	4	3	12	3		4	2	2		1		
Manchuria—																			
Changchun	C	4			4	3			3								1		
Dairen	C	15	13	15	16	12	10	13		14	11	12	11	4	11	3	3		
	D	8	7	8						7	4	2	7	4	4	3	1		
Fushun	C									4	2				1				
	D														1				
Harbin	C	5	7	7	10	14		11	2	4	2	14	11						
Kwantung	C											14							
Mukden	C	4	21	1	4				3	1	3	1	1						
	D												1						
Pensihu	C									1									
	D									1									
Port Arthur	C														1				
South Manchuria Railway Zone	C											5							
Shanghai—																			
Foreigners only	C	5	6	7	3	2	1	3	5	4		3		1	1				
Including natives	D	11	19	9	9	1	7	5	6	2	6	3		6	4				
Tientsin	C	48	20	13	17	5	1	1	2	2	6	4	4						
Chosen (see table below).																			
Curacao (alastrim)	C	2	3																
Dominican Republic: Santo Domingo	C			2	1														
Dutch East Indies:																			
Balikpapan	C													7					
	D													2					
Belawan Deli	C											9	2		2		2		
	D											3			1				
Borneo—Pontianak	C		1																
Java—																			
Batavia and West Java	C	4	2	5	1	2													
East Java and Madura	C	2	9		2						1								
	D		1		2														

Palembang	C														1				
Sumatra—Medan	C	23	14	7	2		1	5	4		2		2						
	D	11	2	5	3		1	2	2										
Ecuador (see table below).																			
Egypt	C	1	2	52	12	1													
	D			33	7			1											
Behera Province	C														1				
Cairo	C	1																	
France (see table below).																			
Gold Coast (see table below).																			
Great Britain:																			
England and Wales	C	1,530	1,473	1,341	1,344	319	336	258	286	365	282	230	219	182	177	173			
Birmingham	C	44	3	1	1						2				1				
Bradford	C	24	12	19	14	2	7	2	8	6		3	1	2					
Bristol	C	3	4	12	17	4	1	4	1	1			1						
Cardiff	C			5	3		1		1										
Castleford	C		4	36	69	11	6	4	3	5	4		9	2	5	4		6	
Hull	C												1	1	20	3			
Leeds	C	3	9	14	1					3	4	1			1				
Liverpool	C		1																
London	C	4	14	17	42	5	10	5	5	49	24	11	12	4	3	9			
Manchester	C	25	8	14	8	1	1	2	1	1									
Newcastle-on-Tyne	C	27	12	9	4	1	6	3	2	3	2		1		28				
Nottingham	C	27	11	13	17	5	10		5	2	1			2	1				
Sheffield	C	8	6	1	14	2			2		1		1	1			1		
Stoke-on-Trent	C	1	15	12	32	9	8	6	1	4	2	7	1		3		2		
Weymouth	C														1				
Greece (see table below).																			
Hedjaz	C	35	115						6	3		11		8		5	5		
	D	23	46						2			1		1		2	3		
India	C	17,777	18,850	28,034	30,436	6,558	5,978	5,124	3,829	4,608	3,515	3,015							
	D	3,709	3,826	5,540	6,672	1,334	1,358	1,383	971	1,051	937	795							
Bassein	C	1			1														
Bombay	C	61	149	218	200	46	37	26	27	19	15	20	17	17	27	11	12		
	D	24	73	120	118	25	22	18	13	15	8	12	11	6	16	6	5		
Calcutta	C	58	71	134	171	41	29	31	29		22	23	16		15	11	7		
	D	34	50	104	130	30	26	23	22		16	20	14		10	8	4		
Karachi	C		1	1	2			3							2		1		
	D		1		1			1							1		1		
Madras	C	74	100	183	169	17	22	11	9	6	9	7	13	10	11	8	10		
	D	8	19	29	38	5	5	3	5	3	1	2	4	3	4	6	5		
Moulmein	C												1		2	2	5		
	D												1		1	1	4		
Negapatam	C	8	3		7	3	4	1			9	4	6		2	8	16		
	D	3			3		1			2	2	2	1		1	1	2		
Rangoon	C	275	377	320	167	15	8	6	7	5	3	5	17	2	1	4			
	D	64	104	102	69	4	2	2	5	2	1	1	2	1	1	1	1		
Tuticorin	C					3													
Vizagapatam	C	10	2	3	2	2		1		4	4				2	1			
	D	8						1				3			1	2			

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

SMALLPOX—Continued

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	Week ended— May, 1928 12	19	26	June, 1928 2	9	16	23	30	July, 1928 7	14	21	28	August, 1928 4	11
India (French):																			
Chandernagor	C			5	5														
	D			1	1														
Pondicherry	C	47	9	18	36	16		7	9	6	3	2	2		3	5	4		
	D	47	9	18	30	16		6	1	6	3	2	2		3	5	4		
Indo-China (see also table below):																			
Saigon	C		3																
Iraq:																			
Baghdad	C	19	7	5	5	6		3	7	3	3	7	3	7	10	2	5		4
	D	11	4	4	3	1		2	3	1	1	7	1	3	6	2	4		1
Basra	C	1	7	5	4		1	2				1	1	6					
	D			2	2		1	2				1	1	2					
Italy:																			
Leghorn	C		1	1															
Palermo	C			5	10	2		4		4	6								
Rome and vicinity	C	3																	
Ivory Coast (see table below).																			
Jamaica (outside Kingston) (alastrim)	C	5	10	13	4		1	1		1		2							
Japan:																			
Kobo	C						6	3	2										
Nagoya	C				6	2													
Osaka	C											2	2						
Tokyo City	C	4	4	15	8		2												
	D	1	2	1	1														
Tokyo prefecture (outside city)	C			24	1	1													
	D			1	2														
Yokohama	C				2	1	1	1											
	D						1												
Latvia (see table below).																			
Mauretania	C		P																
Mexico (see also table below).																			
Acapulco	C					2													
	D					2													
Jalisco (State)	C		P	P	P														
Guadelajara	D		1	2	12	7	4		2	4	2	2	2	1	1	3	4	1	
Manzanillo	D			1															
Mazatlan	D						2		1	1	1								
Mexico City and surrounding territory	C	2	1		1	1		1						1	2				
	D									1									
Reynosa	C															1			

Saltillo	D					1	1			1		1							
Tampico	C		1																
Morocco (see table below).																			
Nigeria (see also table below):																			
Lagos	C			1									1						
Southern Provinces	C		7	93						44	7								
	D			35						12									
Palestine: Jerusalem	C	1																	
	D	1																	
Persia (see table below).																			
Poland	C	3	1	1	9				1	1	2								
	D				1														
Portugal (see also table below):																			
Lisbon	C	12	20	5	6	3		3	1	2		2	3	3	1				
	D		1																
Oporto	C				1														
Senegal (see also table below):																			
Dakar	C		34	29	16	12	7	5	5	4	4								
	D			20	8	4	3												
Siam	C	35	12	28	10	1	7				3								
	D	4	3	4	3				1		1								
Bangkok	C				1														
	D								1										
Spain (see also table below):																			
Valencia	C		1	2															
Straits Settlements: Singapore	C	1	1	1	3					1									
Sudan (Anglo-Egyptian)	C	85	109	332	160	39	7	75	47	22	18	93	78	32	63		49	31	
	D	48	27	100	32	4	1	6	9	7	3	17	10	5	18		12	9	
Sudan (French) (see table below).																			
Syria (see table below).																			
Taiwan: Keelung	C											1							
Tunisia: Tunis	C	3	14	4	6		1		2	1			1	5					
Union of South Africa:																			
Cape Province	C	P																	
Natal	C	P	P	P															
Orange Free State	C	P		P		P				P	P								
Transvaal	C				P				P		P	P							
Union of Soviet Socialist Republics (see table below).																			
Upper Volta	C		5	2	9														
Venezuela: Maracaibo	C	1																	
	D	1	1																
On vessel:																			
S. S. Arendskerk at Singapore, from Amoy, China	C			P															
S. S. Kashgar at Kobe, from Shanghai	C				P														
S. S. Rohna at Penang from Negapatam	C							P											
S. S. Theseus, from Jeddah to Penang	C														1				
S. S. Tjileboct at Hong Kong, from Shanghai	C				P														
S. S. Yarmouth at Kingston, Jamaica, from Habana, Cuba	C			1															
S. S. Victoria at Nome, Alaska	C											8							

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

SMALLPOX—Continued

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

Place		October-December, 1927	January-March, 1928	April, 1928			May, 1928			June, 1928			July, 1928	
				1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Algeria (see also table above)	C	682												
Oran	C	11												
Indo-China (French) (see also table above)	C	97	426		35		36	6	37	47		36	8	3
Ivory Coast	C							7						4
Senegal (see also table above)	C				51				20	23	14	2		
	D				7				9					
Dakar	C				11		12	7	5	4	1	3		
	D				8		4	3						
Sudan (French)	C		15		4		30	P	P	20				17
	D						6							
Syria:														
Aleppo	C	1	1								1	2		
Beirut	C	2	75	3	5	1	2	3	2	1	7	2	4	
	D		2	1										
Damascus	C	47	14											

Place		October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928	June, 1928
Angola	C	151	10	36	1			
	D							
Congo	C	77		36				
Cuanza-Norte	C				1			
Cuanza-Sul	C	9	10					
Loanda	C							
Zaire	C	5						
Brazil (see also table above):								
Porto Alegre	C	5		1				
British East Africa (see also table above):								
Zanzibar	C	2						
	D	1						
Chosen	C	4	4	21	23		152	
	D	1	2	8	6		38	
Seoul	C				1			
Ecuador: Guayaquil	C	6	2	9	24	19	31	11
	D				1			
France	C	25	11	10	13	6	15	21
Gold Coast	C	4		1	3			

Place		October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928	June, 1928
Greece	C	9	6	11	19	1	22	31
	D			2	2		1	2
Latvia	C	2		1				
Mexico (see also table above)	D	346	256					
Morocco	C	622	55	47	30	19	25	10
Nigeria (see also table above)	C	316	275	317				
	D	81	39	45				
Persia	D	2	7					
Portugal (see also table above)	C		143	115			98	
	D		22	8			9	
Lisbon	C						8	
Spain (see also table above):								
Madrid	D	1						
Union of Soviet Socialist Republics:								
Railways, etc.	C	33	18	20				
Other territories in Europe	C	1,256		998				
Transcaucasus, Siberia, and Central Asia	C	81						
Ukraine	C	48	6	11				

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

TYPHUS FEVER

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

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	Week ended— May, 1928: 12	19	26	June, 1928: 2	9	16	23	30	July, 1928: 7	14	21	28	August, 1928: 4	11
Algeria (see also table below):																			
Algiers	C	1	3	9	4	1	1	2	9	28	1	2	2	1		2			
	D		1		2					6									
Oran	C	2	10	4	11	1		3		5	1		1	2	6	6			
	D				1						1								
Austria: Vienna	C	1																	
Bulgaria (see also table below):																			
Kustendil Department	C													2					
Sofia	C	1		20	1	1		9	10	3	10	1		1					
	D								1	2	3	1							
Chile:																			
Talcahuano	D			1															
Valparaiso	C		1								1								
	D									2	1								
China (see also table below):																			
Manchuria—																			
Dairen	C				10														
Harbin	C				2			4	12	7	9	4	3						
Kwantung	C										223	181			213				
South Manchuria Railway Zone	C										7	3			5				
Tientsin	C							1	2										
Chosen (see table below).																			
Czechoslovakia (see table below).																			
Egypt	C	9	17	2	3		11					7							
	D	2	8	1	1		2					3							
Alexandria	C														1				
Assiout Province	C									1			1	1	1				
Assouan Province	C									1									
Behera Province	C			29	32	5	15	8	15	3		3	1	2					
	D				7	1		2	4	2									
Cairo	C			2	4										1				
	D			1	4										1				
Dakalieh	C									1				1					
Gharbieh Province	C			23	14	1	2		2	2			2		1				
	D				5					1		1	1						

Keneh Province	C			5	38							1							
	D				7							1							
Menoufieh Province	C				28	5	1	1	2	3		1	1						
	D				3		1	1	1	1		1							4
Port Said	C														1	1			
Suez	C																2	1	
	D							1											
Great Britain: London County	C							1		1	1								
Greece: Piræus	C											1							
Hungary: Budapest	D											2							
Ireland:																			
Belfast	C								2	1									
	D									1									
Irish Free State	C	1			1				4										
Cork County	C				1														
Galway County—Oughterard	C																10		
Japan (see table below):																			
Hiogo	C											1							
Yamagata	C							2			2								
Latvia (see table below).																			
Lithuania (see table below).																			
Mexico (see also table below):																			
Durango	D													1					
Guadalajara	D							1											
Mexico City, including municipalities in Federal District	C	5	8	12	8	7	4	4	4	4	3	5	2	6	2	1	1		
	D		4	3	1				2					2		1			
Monterey	D			1															
Morocco (see also table below)	C	1,051	316	748	591	62	63	72	83	40	44	55	75	40	50	49			
Palestine	C	5	10	7	6	2	1	1		2	1	3	2	1	3	8		2	
Peru (see table below).																			
Poland	C	346	265	382	144	90	49	53	34	28	39	35	32	8	30	15			
	D	19	26	25	12	7	6	4			3	2	1	1		2			
Portugal (see also table below):																			
Oporto	C	1												1					
Rumania	C	39	68	141	142	30	28		32	36	21	18	5	8	8				
	D	9	5	11	12	1	3		4	6	4	1			1				
Syria (see also table below):																			
Aleppo	C										2								
Tunisia	C	4	1	18	19	3			4		4	3							
Union of South Africa:																			
Cape Province	C	1	P		P	P	P				P	P							
Natal	C	1	2		P	1		2			P								
Orange Free State	C	P			P	P	P				P	P							
Transvaal	C							1											
Union of Soviet Socialist Republics (see table below).																			
Yugoslavia (see table below).																			
On vessel S. S. Gaika at Durban, Natal, from Mauritius	C		1																

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

TYPHUS FEVER—Continued

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

Place		1927 July-September	1927 October-December	January, 1928	February, 1928	March, 1928 1-10	March, 1928 11-20	March, 1928 21-31	April, 1928 1-10	April, 1928 11-20	April, 1928 21-30	May, 1928 1-10	May, 1928 11-20	May, 1928 21-31	June 1-10, 1928
Algeria (see also table above)	C	110	12												
	D	13	1												
Algiers	C	10	2												
Bulgaria (see also table above)	C	43	4	13	26							26			16
	D	3	2	1	5										2
Morocco (see also table above)	C	231	123												

Place		October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928	June, 1928
China (see also table above):								
Shanghai	D	1						
Chosen	C	80	183	400	313		241	
	D	6	19	44	25		32	
Chemulpo	C		1		1		2	
Gensan	C		1					
	D		1					
Seoul	C	2			10	28	18	
	D	1			1	2	4	
Czechoslovakia	C	7			25			
Greece: Athens	C	1	2	2		13	11	9
	D					2	2	1
Japan	C	1					21	
Latvia	C			1	26	4	1	
Lithuania	C	54	86	137				10
	D	3	10	12				

Place		October-December, 1927	January, 1928	February, 1928	March, 1928	April, 1928	May, 1928	June, 1928
Mexico (see also table above)	D	98	46					
Peru:								
Arequipa	D	3	2			1		
La Oroya	C		P	P	P			
Turkey	C			17			7	2
	D			1			1	
Union of Soviet Socialist Republics:								
Railways, etc	C	102	41	107				
Transcaucasus, Siberia, and Central Asia	C	190	7					
Ukraine	C	631	533	459				
Other territories in Europe	C	1,924		1,853				
Yugoslavia	C	2	7	24	3	10	19	16
	D		3			1	3	1

YELLOW FEVER

Place		Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	Week ended— May, 1928			June, 1928					July, 1928				Aug. 4, 1928
								12	19	26	2	9	16	23	30	7	14	21	28	
Belgian Congo:																				
Boma	C		3																	
	D		2																	
Matadi	C		29	14	1		2				2									
	D		16	13																
Brazil:																				
Aracaju	D										2									
Bahia	C												1	3						
Estancia	C				1															
Pernambuco	C											1								
Rio de Janeiro	C										2	4	16	14	14	10	12	10	8	6
	D										2			6	9	5				
Dahomey: Grand Popo	C	1										1	2							
	D											1	1							
Gold Coast	C	1							2											
Ivory Coast	C		1											1						
	D		1											1						
Abidjan	C													1		1				
Ferkes-Sedougou	D																			1
Senegal: Dakar	C	7	2																	
	D	7	2																	

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