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## CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES <sup>1</sup>

January 31–February 27, 1932

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease".

*Influenza.*—There was a sharp increase of influenza cases from 6,909 cases reported for the 4-week period ended January 30 to 25,207 for the current period. All regions showed very significant increases except the New England and Middle Atlantic, where the incidence very closely approximated the incidence for the preceding 4-week period.

For the country as a whole the influenza incidence for the current period, although showing considerable increase, which <sup>28</sup>may be expected at this season, was still about 40 per cent below the incidence for the same period last year and almost 60 per cent lower than in 1929. The disease was, however, more than twice as prevalent as for the corresponding period in 1930—a more nearly normal year. The disease was unusually prevalent in the West North Central and Mountain and Pacific areas. In the former area 2,280 cases were reported for the current period, as compared with 1,102, 218, and 1,455 for the same period in 1931, 1930, and 1929, respectively; and in the latter area, 9,719 cases were reported as compared with 1,968, 687, and 1,505 in the years 1931, 1930, and 1929, respectively.

*Poliomyelitis.*—The incidence of poliomyelitis showed a very slow decline, dropping from 156 cases for the preceding 4-week period to 130 for the current period. For this same period in 1931, 1930, and 1929 there were 96, 79, and 68 cases, respectively, making the incidence this year the highest of the four years. A comparison of

<sup>1</sup> From the Office of Statistical Investigations, U. S. Public Health Service. The numbers of States included for the various diseases are as follows: Typhoid fever, 47; poliomyelitis, 48; meningococcus meningitis, 48, smallpox, 48; measles, 45; diphtheria, 47; scarlet fever, 47; influenza, 39 States and New York City. The District of Columbia is counted as a State in these reports.

geographic areas shows that in the New England and Middle Atlantic States the number of cases this year was 2.4 times the number for the same period last year; in the East North Central group the number of cases was 1.8 times the number last year; and in the South Atlantic group the number was 1.6 times last year's figure. In the West North Central group the number of cases was 5 for the current period against 12 last year, and in the South Central and Mountain and Pacific groups the number very nearly approximated last year's figure for the corresponding period.

*Typhoid fever.*—For the 4-week period ended February 27 the number of cases of typhoid fever was 794, as compared with 580, 650, and 512 for the same period in the years 1931, 1930, and 1929, respectively. A low incidence, however, was still maintained in the West North Central and Mountain and Pacific areas, the number of cases in those areas being the lowest in four years. On the other hand, the South Central, South Atlantic, and East North Central areas reported the highest number of cases in four years. In the New England and Middle Atlantic States the incidence was not far from the average of the three preceding years.

*Scarlet fever.*—For the country as a whole the number of cases of scarlet fever (23,442) reported during the four weeks ended February 27 was approximately the same as that reported for the corresponding period last year. The incidence also compared very favorably with the incidence in 1930 and 1929, the number of cases for the current period being but little in excess of the number reported for the same period in either of those years. A comparison of geographic areas shows that the disease was less prevalent during the current period than at the same time last year in all areas except the New England and Middle Atlantic. In those groups of States the number of cases (12,117) was 1.4 times the number reported for the same period last year and was the highest number reported for the corresponding period in four years. The decreases as compared with last year in the other regions ranged from 10 per cent in the South Central groups to 43 per cent in the West North Central group.

*Smallpox.*—The number of cases of smallpox reported for the current period was 1,402, approximately 700 less than was reported for the preceding 4-week period—a decline somewhat greater than would ordinarily be expected during this period. All regions except the South Atlantic shared in the lower incidence. North Carolina reported 16 cases for the current period, as compared with 7 for the preceding period, which seemed responsible for a slight increase in that group. In the New England and Middle Atlantic region Massachusetts reported a drop from 40 cases during the preceding week to 3 for the current week, but the disease still remained unusually prevalent in

Vermont and Connecticut. In relation to previous years all sections of the country, except the New England and Middle Atlantic States, maintained the lowest level that has been reached in four years. The unusual appearance of smallpox in several States in the New England and Middle Atlantic sections has kept the incidence in that group considerably above that of the corresponding period in the three preceding years.

*Meningococcus meningitis*.—The number of cases of meningococcus meningitis continued to be the lowest in four years. For the 4-week period ended February 27 the number of cases totaled 327, as compared with 588, 1,011, and 938 for the corresponding period in the years 1931, 1930, and 1929, respectively. The low incidence was very general, the decreases ranging in the various geographic areas from 25 per cent in the East North Central group to 60 per cent in the South Atlantic group.

*Diphtheria*.—There were 5,139 cases of diphtheria reported for the current 4-week period, approximately 1,600 less than in the preceding period. All areas shared in the lowered incidence. A comparison with previous years shows that for the total reporting area the number of cases was still about 13 per cent in excess of last year's figure. The number was, however, considerably lower than for the corresponding period in 1930 and 1929. Only in the North Central group was the disease less prevalent during the current period than at the same time last year.

*Measles*.—The incidence of measles increased about 40 per cent during the current 4-week period over the preceding period. All regions contributed to this expected seasonal increase. The current figure (38,393) very closely approximated the average incidence for preceding years. The New England and Middle Atlantic States continued to report the highest incidence of measles in four years. The number of cases in the North Central and South Atlantic regions showed a drop of approximately 50 per cent from last year's figure, and in the South Central States the number of cases (793) was only 20 per cent of the incidence for the same period last year.

*Mortality, all causes*.—The average mortality rate from all causes in large cities, as reported by the Bureau of the Census, was the same for the current period as for the preceding 4-week period, viz, 12.3 per thousand population (annual basis). In relation to recent years the current mortality was the lowest recorded in seven years.

## THE IMPINGER DUST SAMPLING APPARATUS AS USED BY THE UNITED STATES PUBLIC HEALTH SERVICE

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### INTRODUCTION

The important rôle of atmospheric dust in the causation of pulmonary fibrosis has for a long time been recognized by students of industrial hygiene and the occupational diseases.<sup>1</sup> The United States Public Health Service and the United States Bureau of Mines became interested in this problem in 1914, and in 1915 published the first report of their joint study made among the hard-rock miners of the Joplin (Mo.) district.<sup>2</sup>

The recognition of inhaled dust as the factor of chief importance in the production of pulmonary disease among miners emphasized the significance of the quantitative aspects of this problem. Thus methods for the sampling and estimation of the quantity of dust in air began to receive the attention of workers in this field. The South African investigators began using the sugar tube method for the sampling of atmospheric dust in 1911,<sup>3</sup> and Lanza and Higgins in the Joplin study previously referred to also availed themselves of the same technique. In fact, no other suitable method was then available. In 1912 the Committee on Standard Methods for the Examination of Air of the American Public Health Association recommended the sugar tube as the standard method for the sampling of atmospheric dust.

This method of dust sampling had several drawbacks, the chief of which were its slow sampling rate (the American Public Health Association Committee sampled 5 cubic feet in 18 minutes) and the fact that the sugar always contained a certain quantity of dust which introduced a variable, and sometimes considerably doubtful, element into the final results.

To overcome the limitations of the sugar tube method, various investigators attempted to devise other procedures for the sampling and analysis of atmospheric dust. One of the most fruitful studies was that of Palmer,<sup>4</sup> who in 1916 presented his water-spray apparatus for sampling dust. This method was adopted in 1917 by the Committee on Standard Methods of the American Public Health Association and was recommended as the standard technique for the sampling

<sup>1</sup> For a summary of this subject the reader is referred to a paper by H. S. Willis, entitled "Pneumonococcosis and tuberculosis." *Medicine*, 9, Dec. 1930.

<sup>2</sup> Lanza, A. J., and Higgins, Edwin: Pulmonary disease among miners in the Joplin District, Missouri, and its relation to rock dust in the mines. U. S. Bureau of Mines Technical Paper 105. 1915.

<sup>3</sup> General Report of the Miners' Phthisis Prevention Committee. Pretoria, 1916. Page 66.

<sup>4</sup> Palmer, G. T.: A new sampling apparatus for the determination of aerial dusts. *American Journal Public Health*, vol. 6, 1916, pp. 54-55.

of dust in air. The United States Public Health Service began employing this apparatus in 1918 in its studies of dust in air.

In 1916 the South African investigators, desirous of obtaining a more portable type of instrument and one which would yield results more rapidly, described a new instrument known as the Kotzé konimeter.<sup>5</sup> In this instrument a small volume of air, approximately 10 cubic centimeters, is impinged at a high velocity (30 to 80 meters per second) against the surface of a vaseline-coated glass plate, the vaseline serving to retain the particles of dust after they strike the plate. The plate is then removed and placed under the microscope, the adherent dust being counted at a suitable magnification. The United States Bureau of Mines, which had been using the sugar tube method for dust sampling, began at once to study the performance of this new instrument.

In 1922 the instruments mentioned were the ones in most common use. In addition, however, the United States Bureau of Chemistry,<sup>6</sup> in its dust-explosion work, employed an apparatus which consisted essentially of an adapter for holding a Whatman filter paper thimble through which air was drawn by a suction pump, thus sampling the atmospheric dust. By the difference in weight of the paper thimble before and after dust sampling, the weight of the dust was easily determined. Finally, mention should be made of the Anderson and Armspach<sup>7</sup> dust determinator which, in 1922, was in use by the American Society of Heating and Ventilating Engineers. This instrument measured the loss of pressure incident to forcing air through a piece of filter paper; this rate of loss of pressure was then regarded as a measure of the air dustiness.

Very briefly such was the status of the technique of atmospheric dust sampling in the year 1922, when it became apparent that the various dust-sampling methods did not yield results which could be regarded as absolute or even comparable. In fact, sampling in a given industry, by different methods, usually gave findings which were not of the same order of magnitude. As a result, a conference of interested persons was held at the United States Bureau of Mines Experiment Station, Pittsburgh, Pa., in 1922. It was decided at that time to conduct a laboratory study of dust-sampling instruments.

The study was started in the summer of 1922 at the Pittsburgh Experiment Station. Suspensions of dust (five different powdered substances were used) were set up in an air-tight chamber and simultaneous samplings were carried out at first with the sugar tube, the

<sup>5</sup> Final Report of the Miners' Phthisis Prevention Committee, Union of South Africa, Mar. 10, 1919.

<sup>6</sup> Trostel, L. J., and Frevert, H. W.: Collection and Examination of Explosive Dusts in Air. *Journal of Industrial and Engineering Chemistry*, vol. 15, March, 1923, pp. 232-236.

<sup>7</sup> Anderson, F. P., and Armspach, O. W.: A new method of making air-dust determinations. *Journal American Society Heating and Ventilating Engineers*, vol. 28, July, 1922, pp. 533-544.

Palmer apparatus, the konimeter, the filter-paper thimble, and the dust determinator.

During the course of the study, a new instrument, the impinger, for the sampling of dust, was devised by one of the authors and G. W. Smith, then of the United States Bureau of Mines.<sup>8</sup> This new instrument was included in the later stages of the laboratory study of dust-sampling instruments described in the report published as Public Health Bulletin No. 144.<sup>9</sup>

In this instrument, the air to be sampled is drawn through a glass tube and impinged at a high velocity on a glass plate which is kept beneath the surface of the water or other suitable fluid in the collecting flask. The dust is momentarily arrested, wetted by the collecting fluid, and in this manner trapped. After a sufficient volume of air has been sampled, a portion of the collecting fluid is removed to a suitable counting chamber or cell for microscopic count to ascertain the number of particles in a manner to be described later. The remaining portion of the sample may be subjected to any desired analysis.

In the comparative study, the dust-catching efficiency of the impinger was found to be high. Consequently, its physical principles and characteristics were the object of a special study, and finally a satisfactory and practical form of dust-sampling instrument, based on this principle, was evolved.

The apparatus (essentially in its present form), as described in Public Health Bulletin No. 144, possessed an efficiency of 94 to 97.5 per cent when sampling a finely-divided silica dust suspension at the rate of 1 cubic foot per minute. The tests used in estimating this efficiency were conducted by an optical method in which a portion of the dusty air being delivered to the collecting device was diluted with measured amounts of dust-free air until a "match" was obtained on comparison with the stream of air emerging from the dust-collecting device. The comparison, or matching, consisted in producing equal Tyndall effects (equal amounts of reflected light) by the two dust streams when they are simultaneously observed in a beam of light.

So far as the quantitative results of the dust-sampling instruments are concerned, the conclusion of the comparative study was as follows: "Considering the dust caught by the Palmer as unity, the instruments take the following order: On basis of numbers of particles determined—impinger, 5.0; sugar tube, 2.1; and Palmer apparatus, 1.0. On basis of weight of dust determined—impinger, 2.1; thimble,

<sup>8</sup> Greenburg, L., and Smith, G. W.: A new instrument for sampling aerial dusts. Bureau of Mines Reports of Investigations No. 2392, September, 1922.

<sup>9</sup> Katz, S. H., Smith, G. W., Myers, W. M., Trostel, L. J., Ingels, Margaret, and Greenburg, L.: Comparative tests of instruments for determining atmospheric dusts. Public Health Bulletin No. 144, January, 1925.

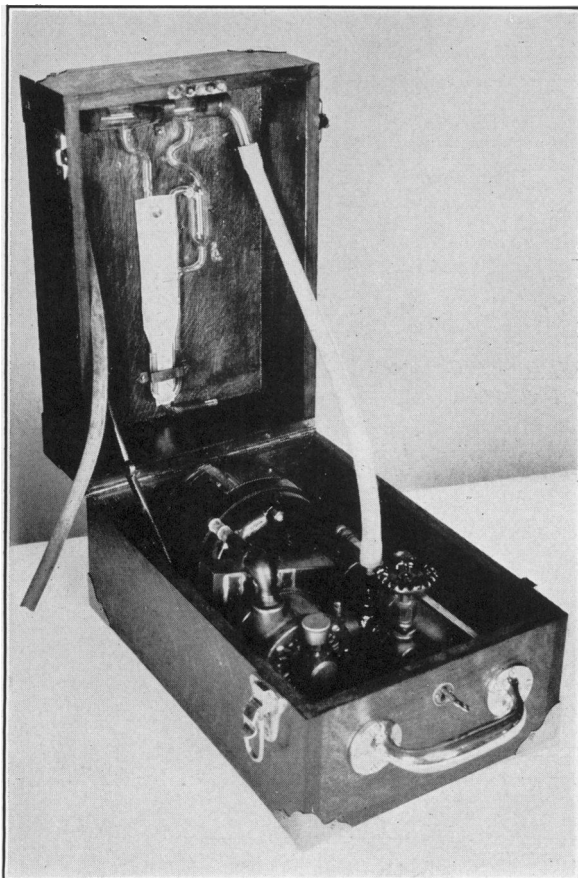


FIGURE 1.—Electrically driven suction apparatus for impinger

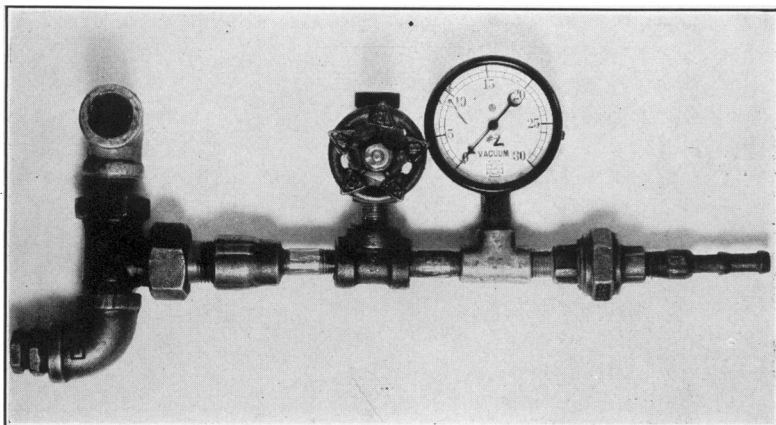


FIGURE 2.—Compressed-air driven suction apparatus for impinger

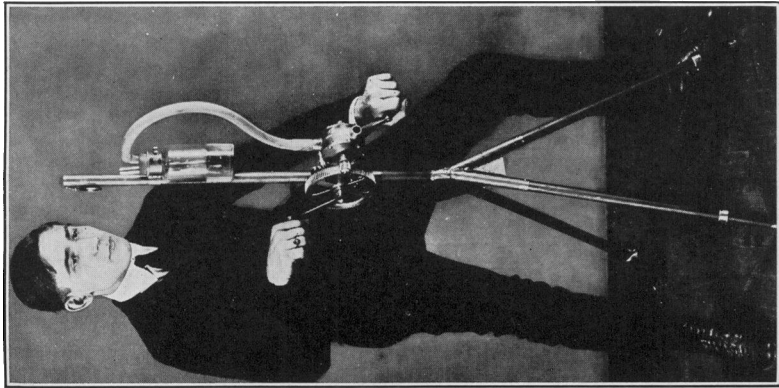


FIGURE 3.—Hand-driven suction apparatus

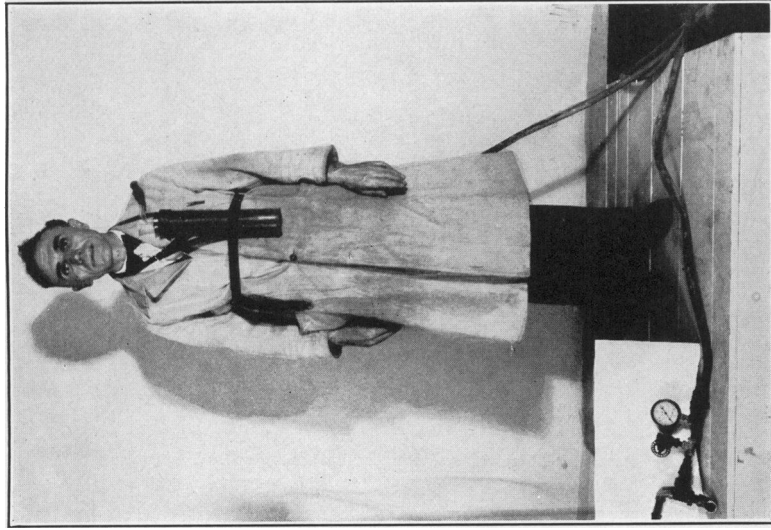


FIGURE 4.—Impinger sampling cylinder attached about neck of wearer

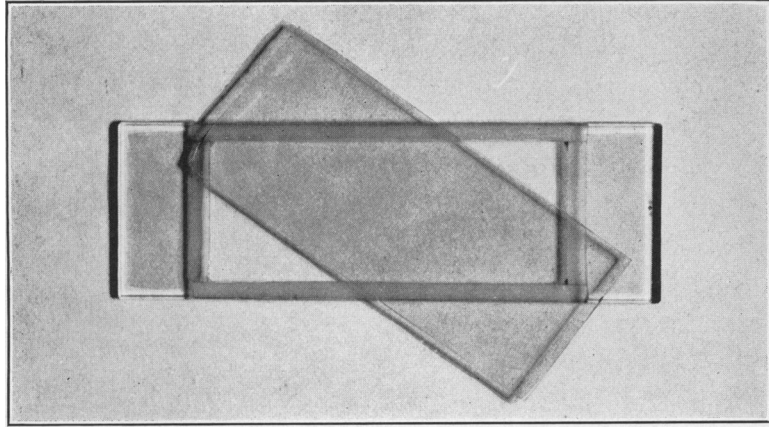


FIGURE 5.—Sedgwick-Rafter counting cell



1.5; sugar tube, 1.6; Palmer apparatus, 1.0." These results have led to the selection of the impinger as the most efficient apparatus for all round industrial dust sampling. The instrument has been used in a number of studies in the dusty trades, in the studies of lead tetraethyl and many other investigations to be mentioned later. Nine years of field experience with the impinger apparatus have given confirmatory evidence of its value as a dust-sampling device.

We have developed several modifications of the apparatus to meet the special requirements of certain problems. The present contribution has been prepared for the purpose of describing the various forms of the instrument in such a detailed manner that the apparatus may be built for anyone requiring its use.

#### APPARATUS AS AT PRESENT IN USE

The impinger apparatus consists essentially of two portions: First, a source of sufficient suction to draw the air to be sampled through the sampling device; and second, the sampling device or impinger itself, which consists of a container and the impinger tube and plate. As a source of suction, an electrically-driven and a compressed-air-driven apparatus have been designed. A hand-driven apparatus developed at the United States Bureau of Mines will also be described.

#### ELECTRIC SUCTION APPARATUS

The electrically driven suction apparatus is designed to be used in places where electrical energy is available. A photograph of the apparatus is shown in Figure 1 (Pl. I); and the mechanical details are presented in Figures 6, 7, and 8. The motor is a series-wound, single-phase, 60-cycle, alternating-current motor of one-fifteenth horsepower, rated at 1.6 amperes, at 110 volts, with a speed of 1,800 revolutions per minute. This motor, being series-wound, operates on either alternating or direct current. The motor is geared to a positive pressure blower of the Roots type by means of a set of gears having a 1 to 3 ratio. In order to minimize noise, the smaller of these gear wheels is made of fiber, the larger being metal. The blower is rated at 4 cubic feet of free air per minute when rotated at a speed of 600 revolutions per minute, and is used as a source of suction rather than as a source of air pressure. Wired in series with the electric motor is a 98-ohm, 1.6-ampere variable sliding rheostat used for speed control of the motor. By employing such a rheostat a voltage of 110 or 220 volts may be used. To the intake or suction side of the blower is attached a  $\frac{1}{4}$ -inch malleable-iron elbow fitting provided with two inlets. To one of the inlets a  $\frac{1}{4}$ -inch brass needle valve is attached, which serves as a by-pass in regulating the rate of suction. The second inlet of the elbow is connected to a constriction-

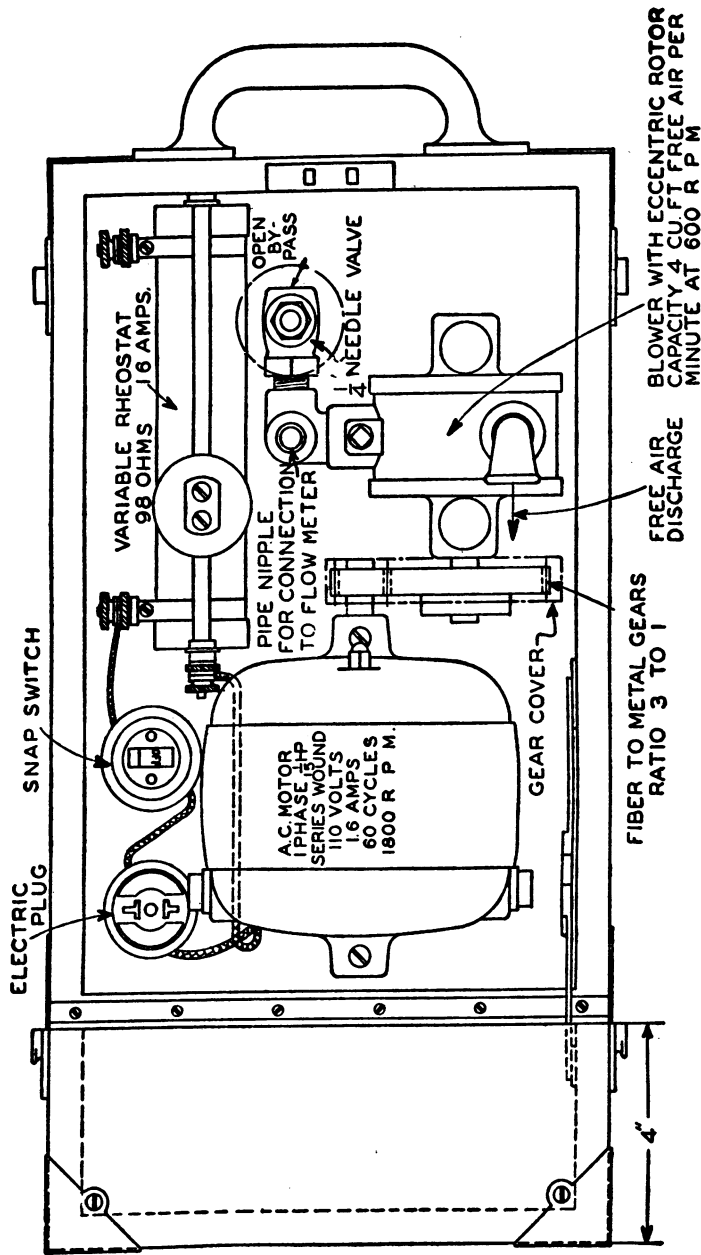


FIGURE 6.—Drawing of electrically driven suction apparatus, top view

type glass flowmeter, by means of a suitable length of noncollapsible rubber tubing; the flowmeter is fastened on the inside of the lid of the carrying case. The inlet side of the flowmeter is connected to the sampling flask by means of a second piece of noncollapsible rubber tubing. The latter piece of rubber tubing may be of any suitable length. The flowmeter scale is calibrated in a manner to be described later. A vacuum gauge may be used instead of a flowmeter as a measuring device for the air flow.

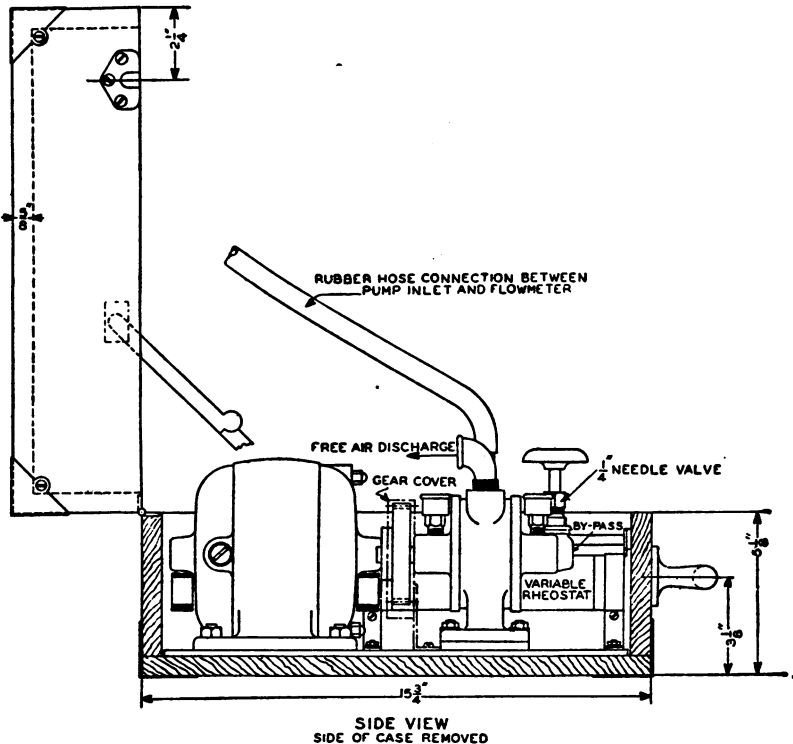


FIGURE 7.—Drawing of electrically driven suction apparatus, side view

The electric motor, blower, sliding rheostat, electric plug, and switch are all assembled on a metal plate 9 by 14 inches and one-eighth inch in thickness, and this plate is in turn firmly screwed to the base of the carrying case. The carrying case is made of  $\frac{1}{2}$ -inch quartered oak, the outside dimensions being  $10\frac{1}{2}$  by  $15\frac{1}{2}$  by  $9\frac{1}{4}$  inches. The weight of the apparatus is 45 pounds.

#### COMPRESSED-AIR SUCTION APPARATUS

In many industrial establishments, mines, and quarries, compressed air is readily available. By means of a very simple device called an ejector, the energy of the compressed air may be con-

verted into suction and then utilized with the impinger tube and flask for the sampling of the dust in air. We have constructed such an apparatus and have found it successful for the purpose intended.

A photograph of this apparatus is shown in Figure 2 (Pl. I), and in Figure 9 is presented a working drawing showing the component parts of the apparatus.

The inlet (compressed-air) side of the ejector is provided with an adapter so that the usual  $\frac{1}{4}$ -inch nipple, as ordinarily used for small

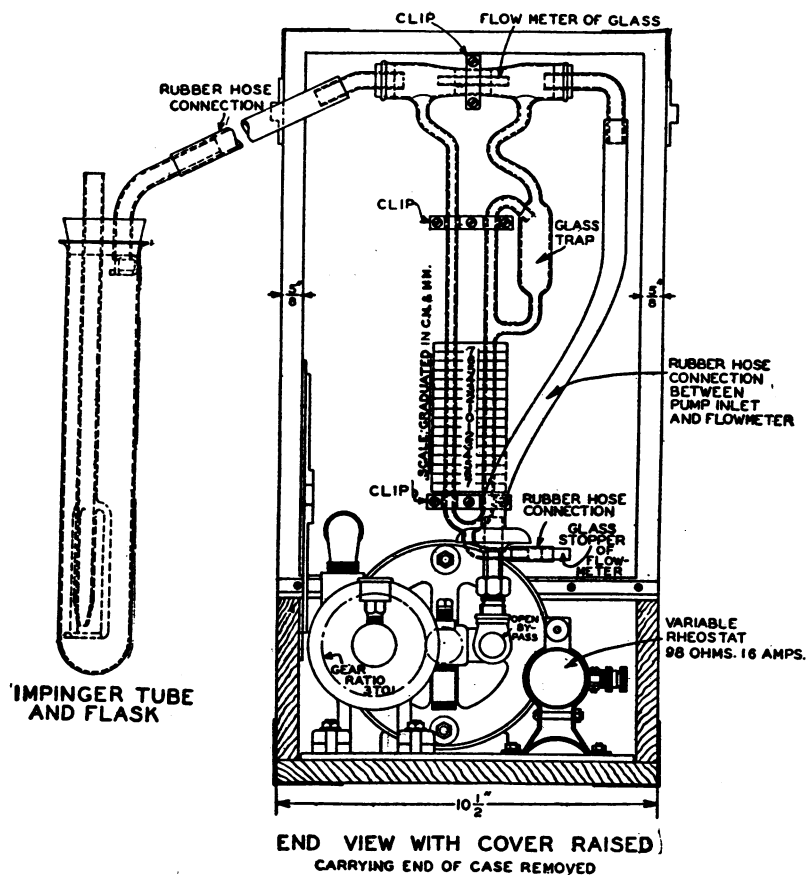


FIGURE 8.—Drawing of electrically driven suction apparatus, end view

compressed-air lines, may readily be attached. To the suction side of the ejector a  $\frac{1}{4}$ -inch iron tee is attached, and to the outstanding leg of this tee a  $\frac{1}{4}$ -inch brass needle valve is secured. To the other leg of this tee a second tee connection is fitted. To the outstanding leg of the second tee, an ordinary vacuum gauge is connected, while to the other leg there is attached an ordinary  $\frac{1}{4}$ -inch pipe union. Finally, to the unoccupied end of this union is fastened a short pipe nipple over which the rubber tube leading to the im-

pinger flask is attached. This tube may be of any suitable length, chiefly dependent upon the requisites of the sampling problem at hand.

Between the two halves of the pipe union there is placed a Monel metal disk approximately 1.5 millimeters in thickness, pierced at its center by a circular orifice seven sixty-fourths of an inch in diameter. By employing such an orifice plate, it is possible to obtain a gauge reading approximately double that obtainable without the use of this device.<sup>10</sup>

Any type of suitably calibrated vacuum measuring device may be used for the measurement of the air flow. The reader will note that we have employed an ordinary vacuum gauge, which in many tests has been found to be sufficiently sensitive and at the same time durable enough to withstand the rough usage to which such field equipment is subjected. The ejector type of instrument weighs approximately 3½ pounds.

#### HAND-DRIVEN SUCTION APPARATUS

Early in the course of the studies at the United States Bureau of Mines Experiment Station at Pittsburgh, the necessity became apparent for a hand-actuated apparatus, to be used in work places lacking electric power or compressed air. Such a device was designed and constructed and is fully described in Public Health Bulletin No. 144. The apparatus in its present form (fig. 3, Pl. II) consists of a tripod of metal tubing supporting a vertical post and a horizontal bar at its apex. The horizontal bar is provided with an ordinary bicycle seat. To the vertical post at a suitable level (adjustable) there is attached a positive pressure blower (used as a source of suction) of the same size and capacity as that used with the electrically driven type of apparatus. In this case, however, all of the excess metal of the blower has been removed by machining in order to reduce the weight of the apparatus. The blower is geared to a pair of crank handles by a pair of gears having an 8 to 1 ratio. The suction inlet of the blower is attached to the impinger sampling bottle which is supported near the top of the vertical post of the tripod. The steel tubing of which the tripod and its appendages are constructed may be dismantled and the complete apparatus fitted into a canvas case somewhat resembling a gun case. The weight of the complete apparatus is approximately 17 pounds.

A revolution counter attached to the large gear records the number of its revolutions. Calibration of the instrument with a gas meter showed that the volume of air sampled per revolution of the pump varied somewhat with the rate of revolution. The calibration curve

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<sup>10</sup> We are indebted to Mr. Theodore Hatch, of the Harvard School of Public Health, for the design for this orifice plate attachment.

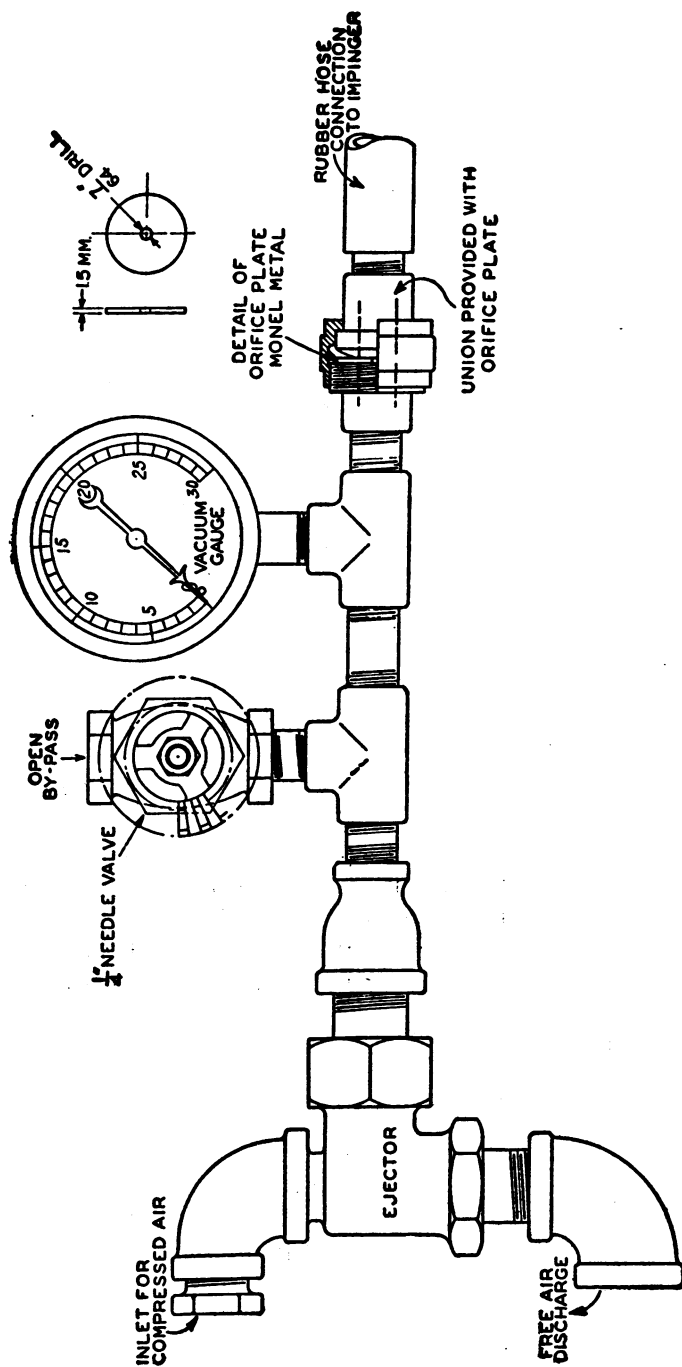


FIGURE 9.—Drawing of compressed-air driven suction apparatus

presented herewith (fig. 10) is taken from Public Health Bulletin No. 144. The particular pump tested aspirated 1 cubic foot of air per minute when operated at 92 revolutions per minute.

When the apparatus is in use the operator turns the crank at the rate of approximately one and one-half revolutions per second, maintained as constantly as possible, for an appropriate length of time. The number of revolutions per minute is determined by dividing the total number of revolutions by the time of sampling. From a curve similar to that of Figure 10, the volume per revolution is calculated, which is multiplied by the number of revolutions to give the total volume of air sampled.

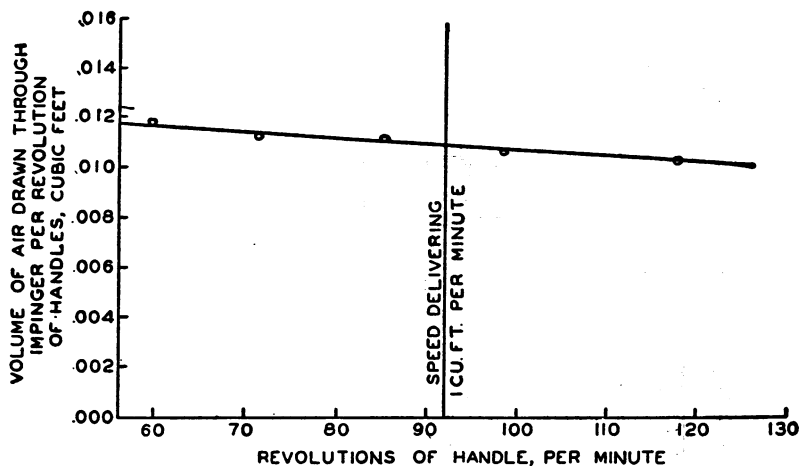


FIGURE 10.—Calibration curve of rotary pump for hand-driven suction apparatus

Of the three types of instruments described we have had least experience with the hand-driven apparatus, since in most industrial places compressed air or electric current were found to be available. For general field use, the compressed-air apparatus, with frequently calibrated vacuum gauge, has been found to be the most satisfactory form of apparatus.

#### IMPINGER TUBE AND SAMPLING FLASK

The impinger tube in the model of the apparatus described in Public Health Bulletin No. 144 (p. 67) consisted of a piece of Pyrex glass tubing, drawn down to a tip with a 2.3-millimeter orifice. To this tube a metal tripod and circular impinging plate were attached by means of a bronze split-sleeve clamp. The distance between the orifice and the upper surface of the plate was kept at 5 millimeters.

In practice, this impinger tube yielded satisfactory results. Nevertheless, it was felt that it would be preferable to eliminate the use of metal, particularly where acid or alkali was to be used as the collecting

fluid. Accordingly, there was designed and constructed the all-glass impinger tube shown in Figure 11, with circular glass impinger plate about 2.5 millimeters in diameter, fixed by three supporting rods about 9 centimeters long to the impinger tube at a distance of 5

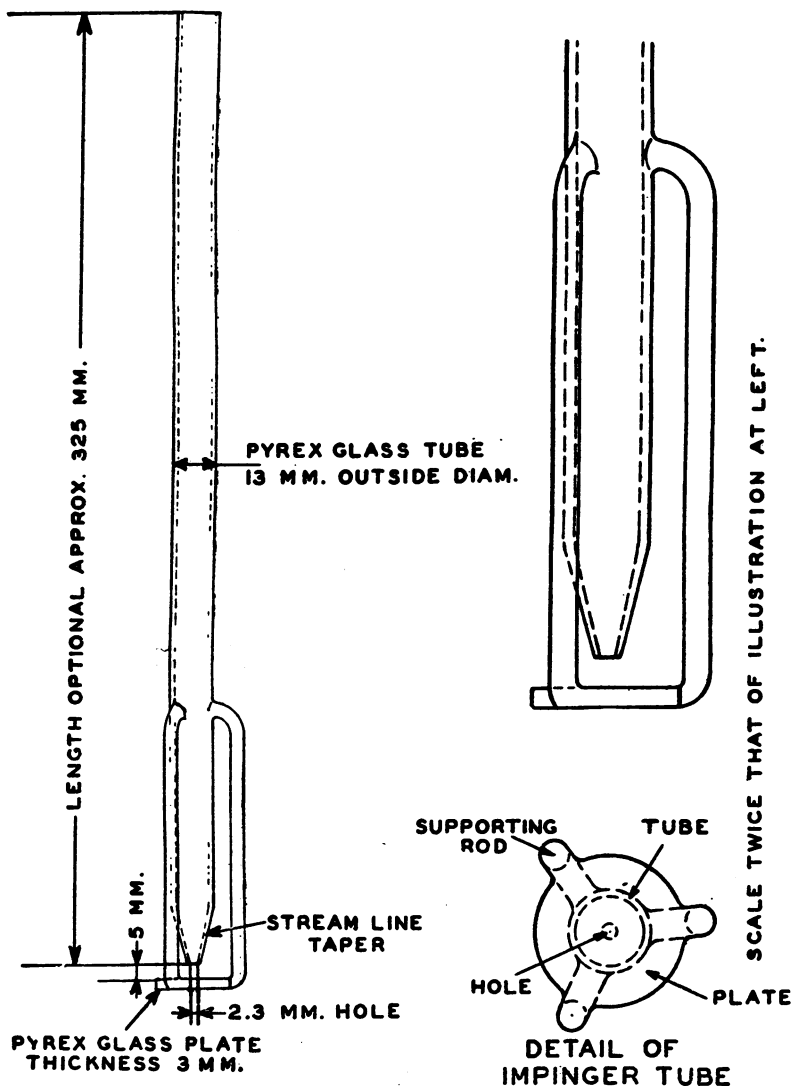


FIGURE 11.—Drawing of impinger tube

millimeters from the orifice. The tube was 13 millimeters in outside diameter. Pyrex glass was used throughout.<sup>11</sup> Tubes of this type have been employed without an undue amount of breakage.

<sup>11</sup> To Mr. Sperling, glass blower of the United States Bureau of Standards, we are indebted for the making of these tubes.



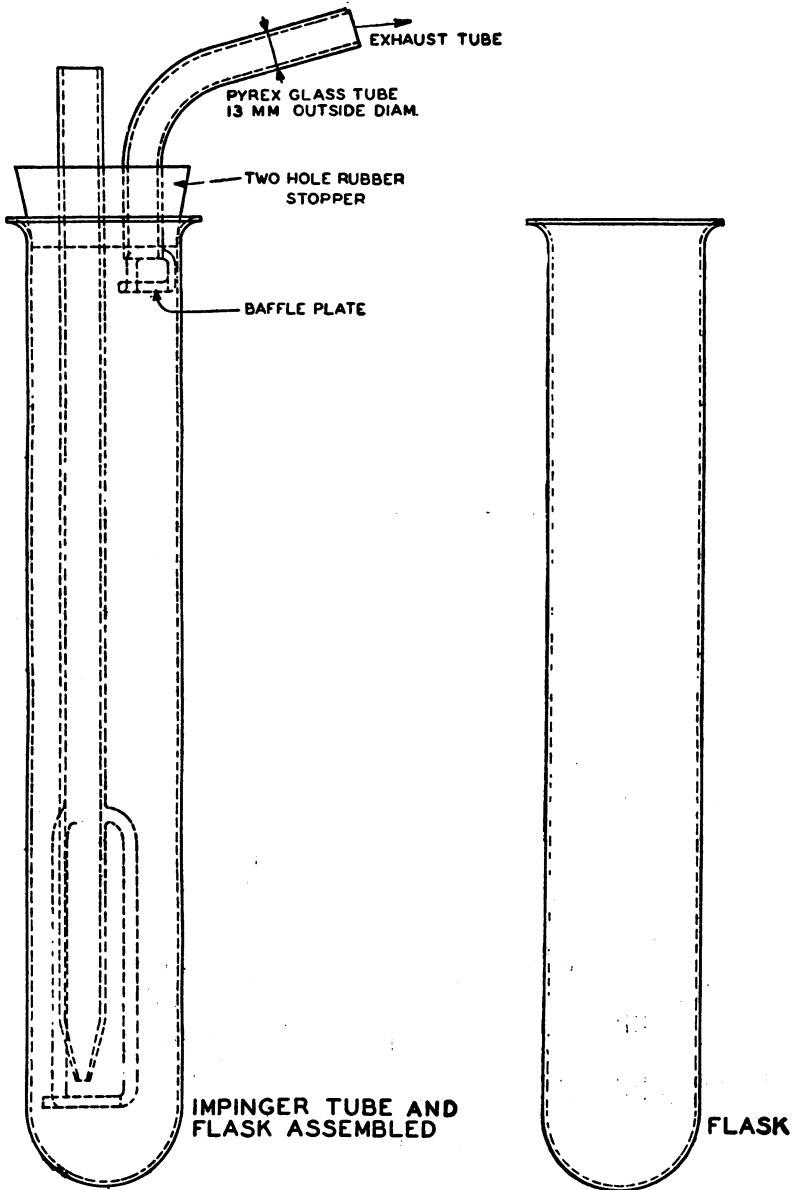


FIGURE 12.—Drawing of glass sampling cylinder and complete impinger

A few modifications have been made in the impinger flask. Originally, a round 16-ounce glass bottle fitted with a 2-hole rubber stopper was used. A short time later we substituted a 500-cubic centimeter Pyrex glass assay flask (wide-mouth conical Erlenmeyer type) which proved to be very satisfactory.

In certain studies it was found desirable to obtain dust samples in the region of the mouth and nose of a worker in order to secure a more representative picture of the air actually breathed. This was done in a very ingenious manner by the Australian workers, Badham, Rayner, and Broose,<sup>12</sup> who utilized as the sampling flask a cylinder 12 inches in length, and 2 inches in inside diameter. The cylinder was fastened to the worker by a specially designed strap passing around the chest. We have employed a similar flask made in the form of a tube sealed at the lower end, 300 millimeters in length and 50 millimeters in diameter, provided with the 2-hole rubber stopper (shown in fig. 12). For protection from the impact of large pieces of flying material, as well as for convenient support, the tube was placed inside of a cylindrical leather holster which in turn was made fast to the chest of the worker by means of a pair of straps fastened about the chest and shoulders. Thus, the inlet end of the impinger tube was fixed at a point very close to the nose and mouth of the wearer. As before, the outlet tube from the sampling cylinder is connected to the source of suction by means of a convenient length of noncollapsible rubber tubing. Figure 4 (Pl. II) shows this form of impinger sampling cylinder with its leather holster, as used in our studies.

Whether bottle flask or cylinder is used, sufficient liquid should be kept in the container during use to cover the impinger plate to a depth of approximately 3 centimeters. In the cylinder type of flask 100 cubic centimeters are sufficient to accomplish this, whereas if the Erlenmeyer type of flask is used, 250 cubic centimeters are required. A baffle plate on the exhaust tube, as shown in Figure 12, is sometimes advantageous.

#### METHOD OF SAMPLING

##### CALIBRATION OF THE IMPINGER APPARATUS

It is necessary to calibrate the air-measuring device of the impinger apparatus so that one may control the rate and quantity of air sampled. The technique employed for this purpose with the hand-actuated suction apparatus has already been described. With the electrically-driven suction device or with the compressed-air-driven apparatus a suitable flowmeter or vacuum gauge is commonly used as the measuring device. For calibration, the apparatus should be

<sup>12</sup> Badham, Charles, Rayner, H. E. G., and Broose, H. D.: Dust sampling in Sydney sandstone industries. Report of the Director-General of Public Health, New South Wales, for the year 1927. Serial No. 12.

assembled in a manner precisely similar to that employed in field sampling, but with the outlet tube of an accurate 5-light, dry, test gas meter attached to the inlet of the impinger apparatus.<sup>13</sup> A calibration curve is then obtained, showing the relationship between rates of air flow, as measured by the gas meter during observed intervals of time, and the readings on the scale of the flow meter or vacuum gauge. The scale reading corresponding to 1 cubic foot per minute may then be ascertained. The air-measuring device should be calibrated at frequent intervals and always after any readjustment of the apparatus. In the field, the predetermined reading should be maintained throughout the course of each sampling period by adjustment of the needle valve.

Prior to the taking of dust samples in the field it is important that the suction apparatus be carefully inspected and completely cleaned so as to insure proper functioning while in use. Care should be exercised to insure against leaky connections in the air circuit.

#### CHOICE AND PREPARATION OF SAMPLING FLUID

In spite of the generally contrary belief, many dusts, including even silica, are soluble in water.<sup>14</sup> This is to a great extent due to the

<sup>13</sup> A convenient method of connecting the gas meter with the electrically driven apparatus was suggested by Assistant Physicist F. L. Knowles of the Office of Industrial Hygiene and Sanitation. This consists in placing the controlling needle valve, mentioned on page 657, in a by-pass which connects the intake or suction side of the blower with the pressure side (instead of merely on the suction side with the other side of the needle valve open). With such a connection, and with tight apparatus, the amount of air discharged at the open pressure orifice represents the exact amount drawn in through the impinger, and the gas meter may be attached to the open pressure orifice so as to work under positive pressure. Under these conditions, the gas meter may be used during actual sampling, and the total volume of the sample may be directly read on the gas meter; it is nevertheless convenient to have a flowmeter or vacuum gauge in the circuit, so that the constancy of the rate may be continually observed.

To determine whether there is a difference in the reading of a meter when it is connected to the intake rather than to the outgo side of the electrically driven impinger apparatus, two meters (one recently calibrated, and the other a used meter) of the same type and capacity were connected in series with the impinger and the blower, one meter at the intake side of the impinger, and the other at the outgo side of the blower, the incoming air passing successively through the first meter, the impinger, the blower, and finally through the second meter. To determine the difference in pressure and temperature of the air entering the two meters, mercury manometers and thermometers were inserted in the circuit before each of the two meters. A flowmeter was also inserted between the first meter and the impinger.

A number of 5-minute tests were made with this arrangement when the blower was cool, the air passing through the impinger at the rate of about 1 cubic foot per minute, the flow meter indicating a nearly constant flow in spite of the usual slight mechanical irregularities in the motion on the meter dials. Allowing for the small difference (about 1.3 per cent) in the rates of the two meters, determined by runs of the two meters in series first on pressure, then on suction, also by interchanging the meters, it was found that the average difference between simultaneous meter readings on the intake and outgo sides of the impinger was less than 1 per cent, the readings on the pressure side being slightly greater than those on the suction. This also indicates that the blower and connections were tight. At the rate of flow used, about 1 cubic foot per minute, the indicated difference in pressure at the two manometers was several millimeters of mercury. The air entering the first meter on suction was found to be, on the average, 0.3° C. lower than that entering the second meter on pressure. After these tests had been made, the blower was allowed to run for three hours to heat it thoroughly and then the tests were repeated. No significant difference was found in the results. It may be noted that the impinger cools the air passing through it, and the blower heats it, so that these two actions tend to neutralize each other.

With the compressed-air apparatus, however, the gas meter is used only for calibration, and is attached by its outlet side to the intake of the impinger tube.—Editorial note.

<sup>14</sup> Myers, W. M.: Solubility of finely divided rock dusts in water, kerosene, and alcohol. Bureau of Mines, Reports of Investigations, Serial No. 2548, November, 1923.

large surface area exposed to the solvent by small particles of suspended material. A proper sampling fluid should be used in order to avoid solution. We have as a rule used distilled water and by conducting the analyses within 24 hours have been able to avoid significant dust loss. Preferably, the counting should be done on the day of sampling. In the case of those dusts not easily wetted by water, such as coal dust, we have employed a mixture of 25 per cent alcohol and 75 per cent water with excellent results. The alcohol increases the wetting power of the solution and at the same time greatly reduces the solubility of mineral dusts in water. Possible action on the rubber stopper of whatever collecting fluid may be chosen should be appropriately controlled.

It is important that the sampling fluid itself be comparatively free from suspended matter. Distilled water should be prepared, if possible, by one of the continuous types of water stills and, after distillation, should be permitted to stand for about 24 hours, the upper part being drawn off for use. If alcohol is employed, it should be redistilled before use.

#### PREPARATION OF SAMPLING FLASKS

Prior to taking samples in the field the desired number of sampling flasks are thoroughly cleaned with hot cleaning solution, rinsed several times in tap water, and finally rinsed with the fluid used as the sampling medium. The stoppers are thoroughly freed from adventitious dust by several washings in tap water and finally in the sampling fluid. The required amount of sampling fluid is placed in each impinger flask, a cleaned solid-rubber stopper is put in place, and a cap of paper is fastened over the top by means of a rubber band. The flasks are now ready for transport to the place where samples are to be taken. We have made use of a carrying case especially built for this purpose. It is portable and accommodates 18 flasks.

#### FIELD TECHNIQUE IN SAMPLING

In taking dust samples the location of the sampling place, the time during which sampling is conducted, and the duration of sampling are all chosen in an effort to obtain the data required by the study in progress. Obviously the requirements of the study under way govern the procedure to be employed.

The 2-hole rubber stopper fitted to the impinger tube and exhaust elbow may be transported in a spare flask containing some of the sampling fluid. Such a procedure serves both to protect the impinger tube and to keep it clean and ready for use. The exposed ends of the impinger tube and exhaust elbow should always be protected against accidental contamination.

After the selection of the sampling position, the stopper of one of the impinger flasks is replaced by the 2-hole rubber stopper containing the impinger tube and exhaust elbow. The solid stopper is put on the spare bottle, thus protecting the rinse fluid and at the same time preventing contamination of the stopper. This completely equipped impinger is now placed in the leather holster, while the holster in turn is securely strapped about the worker or held by an assistant at the desired sampling point. The holster serves a twofold purpose: First, it serves to protect the glass tube from breakage by flying objects in the work place, and, second, it fixes the entrance to the impinger tube very close to the nose and mouth of the worker. The outlet or suction elbow of the sampling flask is connected with the source of suction by means of a suitable length (commonly 25 feet) of noncollapsible rubber tubing.

In certain cases it is not feasible to place the impinger flask about the neck of the worker, nor is it convenient to have an assistant hold the flask near the worker. Under these conditions we have connected a length of rubber tubing (about 15 feet) to the inlet of the impinger apparatus (the impinger tube) and fastened the free end at the desired sampling point. With a sampling rate of 1 cubic foot per minute, dust particles pass through a  $\frac{3}{8}$ -inch tube 15 feet long in less than a second, hardly sufficient time to allow settling to take place.

The duration of the sampling period should be such as to yield a satisfactory suspension of dust for analysis, and is thus dependent on the concentration of dust in the atmosphere. Under the usual industrial conditions, samples of from 10 to 30 cubic feet of air are sufficient to yield enough suspended dust for analysis. Since a sampling rate of 1 cubic foot per minute is maintained, this will require a sampling period of from 10 to 30 minutes. A stop watch is used to measure this period.

After the sample has been taken, the impinger tube is withdrawn. The tube is rinsed both inside and out with some sampling fluid from a fresh bottle, the rinsings being added to the original sample and the sampling flask stoppered and capped for transport to the laboratory. Should the impinger tube be found to be contaminated with adherent dust after rinsing, it should be carefully cleaned or, better still, replaced by an unused tube. Spare tubes should always be carried.

Notes are promptly made of all the pertinent data with reference to each sample.

#### METHOD OF COUNTING

##### COUNTING IN CELLS

Earlier in this report it was pointed out that practically all dusts are, to some extent, soluble in water, and, hence, counts should be conducted within 24 hours after sampling. Such a practice tends to

prevent any undue flocculation as well as solvent action on some of the minute dust particles.

As soon, therefore, as the samples can be transferred to a satisfactory place for counting, the stopper of the flask is removed and carefully washed, the washings being added to the contents of the flask. Next the entire sample is filtered into a previously cleaned graduated flask through a screen of appropriate fineness (325-mesh) so that only particles smaller than 40 microns in diameter are permitted to pass through. If the dust suspension in the graduated

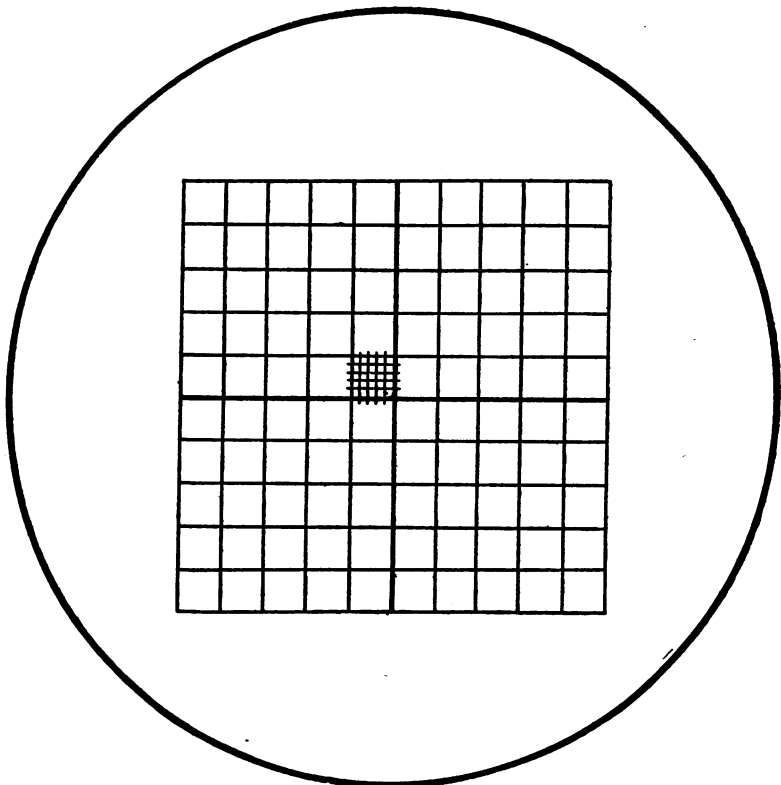


FIGURE 13.—Ruling of Whipple ocular micrometer disk

flask is too dense, further dilution is advisable. This dilution may conveniently be such that the number of particles counted in each microscope field is about 50 to 75. The contents of the graduated flask are next thoroughly agitated in order to obtain a uniform suspension, and two portions of about 1 cubic centimeter each are removed with a pipette so as to just fill, without bubbles, two Sedgwick-Rafter counting cells (see fig. 5, Pl. II). The cells have been previously cleaned very carefully in order to remove any adventitious dust, and have been kept protected from dust particles by the cover slip.

In making dust counts an eyepiece micrometer known as a Whipple disk is employed (see fig. 13). This disk has a large square engraved on it, covering a large part of the field, and this square is divided into 100 medium-sized squares, one of these in turn being further subdivided into 25 very small squares. Using an ordinary microscope provided with a suitable eyepiece and objective and fitted with an Abbé condenser, the proper tube length of the microscope is determined by calibration with a stage micrometer, so that the side of the large square of the eyepiece covers 1,000 microns (1 millimeter). (We employ a 7.5 X eyepiece, 16 millimeters objective, and a tube length of 178 millimeters.) The large square of the eyepiece ruling, therefore, incloses the dust in an area of 1 square millimeter; and since the cell is 1 millimeter deep, all the dust suspended in 1 cubic millimeter of the water is under the ruled field. This examination is accomplished by raising and lowering the lens system so as to focus throughout the entire depth of the cell. As a source of illumination we employ an ordinary small electric microscope lamp.

The dust is allowed to settle for 20 minutes before counting is done. In general, only particles less than 10 microns in diameter are counted. The inclusion of particles larger than 10 microns in the filtered specimen would make but little change in the total count. The average diameter of a particle for the purpose of this exclusion is judged by inspection. In practice it is necessary to count the dust in only one-quarter of each ruled field, the entire field having been examined for uniformity. Such counts on five fields, so dispersed as to be representative, are made on each of the two Sedgwick-Rafter cells. These 10 counts are averaged, but this average is not to be taken as the final count until a corresponding control count has been subtracted. In all cases a sampling flask which is handled in the plant, but through which no air has been aspirated, is used as the control for the particular series of samples taken in that plant on that particular day, and counts are made on this control fluid in the same manner as on the fluid through which the air sample has been impinged. The control sample takes into consideration any dust which may be present in the eyepiece micrometer, in the lenses of the microscope, in the Sedgwick-Rafter counting cell, and in the sampling fluid itself. From the average gross count obtained on the impinger sample, the average control count is to be subtracted to give the average net count per  $\frac{1}{4}$ -microscopic field.

#### COMPUTATION OF RESULTS

The average net count per  $\frac{1}{4}$ -microscopic field is multiplied by 4 to yield the average count in the total field. Since the Sedgwick-Rafter cell is 1 millimeter deep, this figure represents the number of

particles in a cubic millimeter of the diluted sample. This value is multiplied by 1,000 to give the count per cubic centimeter of sample and again by the total number of cubic centimeters of fluid to which the original specimen was diluted. This product is divided by the number of cubic feet of air sampled. In summary, the number of particles per cubic foot of air = average net count per  $\frac{1}{4}$  field times a factor, where the factor =

$$\frac{4 \times 1,000 \times \text{total volume of diluted sample in c. c.}}{\text{Volume of air sampled in cubic feet}}$$

#### RECORDING OF RESULTS

The record should show the sample number, date, sampling location, and volume of air in cubic feet. The steps in counting should be recorded as to date, volume of fluid, volume taken for dilution, calculated total volume at final dilution, average gross count per  $\frac{1}{4}$ -microscopic field, average control count, average net count, factor according to above formula, and finally number of particles expressed in millions per cubic foot, together with any additional notes.

(NOTE.—Only a small portion of the sample is used in this counting technique. The remainder may be used for other desired analysis.)

#### EXTENT OF THE USE OF THE IMPINGER APPARATUS

Since its introduction in 1922 the impinger apparatus has been employed for the sampling of dust in a large number of studies. Hatch, Drinker, and Choate,<sup>15</sup> working at the laboratories of the Harvard School of Public Health, used the instrument in their granite studies and Badham and his coworkers<sup>16</sup> availed themselves of it in their studies of the Sydney sandstone industries. Fehnel,<sup>17</sup> of the Metropolitan Life Insurance Co., employed the impinger apparatus on rock-drilling hazards in New York City, and the workers of the United States Bureau of Mines have utilized it in their studies of mine dusts.<sup>18</sup>

Our own experience with the instrument has covered a very wide range of uses. We have used it in the sampling of dust in outdoor air during a rainstorm, in grinding and woodworking shops, in the

<sup>15</sup> Hatch, Theodore, Drinker, Philip, and Choate, Sarah P.: Control of the silicosis hazard in the hard rock industries. 1. A laboratory study for the design of dust-control systems for use with pneumatic granite-cutting tools. *Journal of Industrial Hygiene*, 12, 3, p. 75, March, 1930.

<sup>16</sup> See footnote 12.

<sup>17</sup> Fehnel, J. William: III. A study of silica dust in hard rock drilling in New York City. *Journal of Industrial Hygiene*, 11, 2, p. 69, February, 1929.

<sup>18</sup> Forbes, J. J., and Emery, A. H.: Sources of dust in coal mines. *Bureau of Mines Report of Investigations*, No. 2793.



silverware-making industry,<sup>19</sup> in sand-blasting processes,<sup>19 21</sup> in the cement industry,<sup>20</sup> in the granite cutting industry,<sup>21</sup> and in bituminous and anthracite coal mines. Reference to Table 1 discloses the dust content of various atmospheres in which the instrument has been used. The table also presents the range (maximum and minimum) of the dust counts and the number of samples taken in the various locations.

TABLE 1.—*Results of analyses of dust samples obtained with the impinger apparatus*

Sampling location	Number of samples	Dust count <sup>1</sup> in millions of particles per cubic foot of air		
		Minimum	Maximum	Average
Outdoor air during rainstorm.....	4	0.3	0.4	0.3
Woodworking shops.....	4	1.1	2.3	1.5
Grinding and polishing shops.....	24	1.2	25.9	4.8
Silverware manufacturing:				
Nonexposed group.....	20	.1	1.2	.8
Exposed group.....	156	.7	116.2	6.3
Cement manufacturing.....	81	.6	105.0	26.0
Granite cutting:				
Hand pneumatic tool operators.....	56	2.4	201.0	59.2
Machine pneumatic tool operators.....	44	.6	165.7	35.9
Attendant labor.....	95	.9	64.0	17.0
Anthracite coal mining:				
Miners and miners' helpers.....	32	3.6	954.7	231.5
Attendant labor.....	19	.1	252.8	31.1
Bituminous coal mining:				
Coal cutters and coal loaders.....	14	5.3	253.6	112.3
Attendant labor.....	4	1.5	10.2	3.9

<sup>1</sup> Total particles.

During the course of certain studies it has become necessary from time to time to sample air for gases and mists. It occurred to us that the impinger apparatus might be of value for this purpose. In studying the concentration of chromic acid in the air of workrooms wherein chromium plating was being conducted, the impinger sampling apparatus was found to be highly efficient.<sup>22</sup> A normal solution of sodium hydroxide was used in this case as the collecting medium, the air being drawn through the apparatus at the rate of 35 liters per minute. The fluid was then titrated by the usual iodometric method with 0.01 N sodium thiosulphate. Samples of air taken with two such impinger flasks in series revealed no chromic acid in the

<sup>19</sup> Greenburg, Leonard: Studies of the industrial dust problem. III. Comparative field studies of the Palmer apparatus, the konimeter, and the impinger methods for sampling aerial dust. Public Health Reports, 40 (July 31, 1925), pp. 1591-1603.

<sup>20</sup> Thompson, L. R., Brundage, D. K., Russell, A. E., and Bloomfield, J. J.: The health of workers in dusty trades. I. Health of workers in a Portland cement plant. Public Health Bulletin No. 176, April, 1928, pp. 3, 24-29.

<sup>21</sup> Russell, A. E., Britten, R. H., Thompson, L. R., and Bloomfield, J. J.: The health of workers in dusty trades. II. Exposure to siliceous dust (granite industry). Public Health Bulletin No. 187, July, 1929, pp. 20-28.

<sup>22</sup> Bloomfield, J. J., and Blum, William: Health hazards in chromium plating. Public Health Reports, 43 (Sept. 7, 1928), pp. 2330-2347.

second flask. Finally, the impinger device was tested in comparison with a gas-absorption device in which the air at the rate of 1 liter a minute was passed through a sintered glass plate gas absorption bottle. In spite of the rapid rate of sampling with the impinger, it was possible to obtain results concordant with those obtained by this gas-absorption device; and as the impinger apparatus samples large volumes of air in short periods of time, it is considered a most satisfactory device for field studies of this type.

The impinger apparatus has been used for the sampling of lead dust and lead fumes in air, both in this country and in Australia. Because of the fine state of subdivision, lead fumes are obviously more difficult to sample than is lead dust. In fact, the sampling of this material constitutes a most severe test of a sampling device. The impinger apparatus was employed for this purpose by the investigators of the United States Public Health Service in the study of lead tetraethyl.<sup>23</sup>

In the atmosphere of industrial establishments not employing lead and yet containing very small amounts of this substance, the instrument was again used with success. Leake<sup>24</sup> records results ranging from 0.37 to 0.02 milligrams of lead per 10 cubic meters of air in the following establishments:

TABLE 2.—*Lead dust in the air of nonlead using industrial establishments*

Establishment	Milligrams of lead per 10 cubic meters of air	Establishment	Milligrams of lead per 10 cubic meters of air
Cracker and cake factory.....	0.37	Dairy.....	0.11
Underwear factory.....	.35	Machine shop (iron and steel).....	.10
Shirt and overall factory.....	.26	Wooden-heel factory.....	.10
Machine shop (brass).....	.24	Tailoring and pressing shop.....	.09
Retail grocery.....	.23	Mail-bag factory.....	.08
Cigar factory.....	.18	Ice-cream plant (very damp).....	.02

Finally, the instrument has been employed by us in investigating one of the dustiest of the lead industries (the making of storage batteries). In one such study,<sup>25</sup> amounts of lead varying from 3.4 to 160 milligrams per 10 cubic meters of air were found in the work-rooms.

#### SUMMARY

The object of the present contribution has been to describe the design and construction of an apparatus for the sampling of atmos-

<sup>23</sup> Leake, J. P., et al.: The use of tetraethyl lead gasoline in its relation to public health. Section V. Atmospheric and dust studies, by J. P. Leake and J. J. Bloomfield. Public Health Bulletin No. 163.

<sup>24</sup> Leake, J. P.: Lead hazards. Journal of the American Medical Association, 89, 14, p. 1105, October, 1927.

<sup>25</sup> Greenburg, L., Schaye, A. A., and Shlonsky, H.: A Study of Lead Poisoning in a Storage Battery Plant. Public Health Reports vol. 44, 28, July 12, 1929, pp. 1666-1698.

pheric particulate matter. This device, known as the impinger apparatus, possesses the advantage of high dust-catching efficiency when sampling air over the full range of dustiness (from relatively pure outdoor air to that found in very dusty coal-mining operations) at the relatively rapid rate of 28.3 liters (1 cubic foot) per minute. The dust is caught in a liquid medium in which it may then be counted and analyzed microscopically, gravimetrically, and chemically. Three forms of the instrument are described: The electrically-driven, the compressed-air driven, and a hand-actuated form. Photographs and drawings of the apparatus have been provided.

The results of the sampling of various dusts, as well as of chromic acid mists and lead fumes, are cited in order to show the range over which this instrument may be used.

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### COURT DECISION RELATING TO PUBLIC HEALTH

*Death certificate as evidence.*—(District of Columbia Court of Appeals; *Labofish v. Berman et al.*, 60 Washington Law Reporter 100; decided Jan. 18, 1932.) An act of Congress approved June 23, 1874, as amended by an act approved June 11, 1878, made it the duty of the health officer of the District of Columbia "to enforce regulations to secure a full and correct record of vital statistics, including the registration of deaths and the interment of the dead." By the act of April 24, 1880, the ordinances of the Board of Health of the District were validated, and the act of August 7, 1894, provided that they should "have the same force and effect within the District of Columbia as if enacted by Congress in the first instance." One of these ordinances made it the duty of the board of health, in case of the death of a person, to require the attending physician "to furnish and deliver, to the undertaker or other person superintending the burial of said deceased person, a certificate, duly filed, setting forth, as far as the same may be ascertained, the name, age, color, sex, nativity, occupation, whether married or single, duration of residence in the District of Columbia, cause, date, and place of death," and made it the duty of the undertaker to forward the certificate to the registrar within 24 hours.

In a case in which the probate of a will was contested, the court of appeals stated that "We think the effect of these acts of Congress is to make death certificates, in the circumstances, public records and not mere police regulations, and, being such public records, we think they may be offered in evidence for the purpose of proving, *prima facie*, the time, place, and cause of death."

# 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 March 5, 1932, and March 7, 1931

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 5, 1932, and March 7, 1931*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931
New England States:								
Maine.....	2	2	8	116	385	31	1	1
New Hampshire.....	1			12	17	18	0	0
Vermont.....		1		3	69	1	0	0
Massachusetts.....	33	44	18	30	584	524	1	3
Rhode Island.....	13	10	2	3	714		0	1
Connecticut.....	7	6	20	13	283	503	0	2
Middle Atlantic States:								
New York.....	122	123	1 514	1 49	2, 307	1, 427	10	20
New Jersey.....	56	69	212	50	170	728	1	5
Pennsylvania.....	168	100			2, 489	2, 884	7	24
East North Central States:								
Ohio.....	59	48	233	167	570	615	3	1
Indiana.....	42	39	200	95	59	787	10	9
Illinois.....	88	187	202	90	263	1, 496	4	19
Michigan.....	31	25	154	209	767	141	1	23
Wisconsin.....	23	9	704	196	405	337	1	1
West North Central States:								
Minnesota.....	10	12	2	1	15	58	0	4
Iowa.....	15	13		1	3	16	0	3
Missouri.....	22	33	15	56	117	397	2	6
North Dakota.....	6	2			59	17	1	0
South Dakota.....	4	8	66		27	27	0	0
Nebraska.....	4	14	86	10	21	15	1	0
Kansas.....	7	7	19	70	169	21	0	1
South Atlantic States:								
Delaware.....	3	2	1	33		46	0	0
Maryland.....	29	19	166	228	40	891	5	2
District of Columbia.....	14	30	7	4	2	154	2	2
West Virginia.....	18	11	295	226	470	40	0	1
North Carolina.....	22	24	44	185	457	574	2	5
South Carolina.....	8	17	1, 049	2, 652	128	99	1	3
Georgia.....	6	9	118	956	12	167	2	1
Florida.....	13	9	9	222	3	127	0	0
East South Central States:								
Kentucky.....	32		653		82	284	4	0
Tennessee.....	19	10	1, 165	312	104	157	1	6
Alabama <sup>1</sup> .....	15	26	99	442	5	641	2	8
Mississippi.....	20	9					0	3

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

<sup>2</sup> Week ended Friday.

<sup>3</sup> Typhus fever, week ended Mar. 5, 1932, 1 case in Alabama.

*Cases of certain communicable diseases reported by telegraph by State health officers  
for weeks ended March 5, 1932, and March 7, 1931—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931
<b>West South Central States:</b>								
Arkansas.....	10	4	81	319	1	35	0	0
Louisiana.....	23	30	169	49	110	26	0	2
Oklahoma <sup>1</sup> .....	24	7	1,383	138	75	25	0	2
Texas.....	61	31	225	59	18	92	0	1
<b>Mountain States:</b>								
Montana.....		4	2,652		42	5	0	1
Idaho.....	1			1		2	0	1
Wyoming.....						1	0	0
Colorado.....	5	9			80	346	1	0
New Mexico.....	8	5	2,012	18	105	47	2	3
Arizona.....	2	6	9	11		180	1	1
Utah <sup>1</sup> .....	1			19	4	5	0	0
<b>Pacific States:</b>								
Washington.....	4	9	8	1	682	44	2	0
Oregon.....	4	3	245	161	192	58	0	1
California.....	58	70	227	602	403	1,205	10	6

Division and State	Polioomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931
<b>New England States:</b>								
Maine.....	0	0	8	33	0	0	0	3
New Hampshire.....	0	0	28	2	0	0	0	0
Vermont.....	0	0	9	5	8	0	0	0
Massachusetts.....	2	0	457	318	0	0	2	2
Rhode Island.....	0	0	57	55	0	0	0	0
Connecticut.....	0	0	143	62	2	0	0	1
<b>Middle Atlantic States:</b>								
New York.....	1	1	1,811	870	0	11	11	10
New Jersey.....	0	0	322	291	0	0	2	2
Pennsylvania.....	1	0	645	643	7	0	10	24
<b>East North Central States:</b>								
Ohio.....	0	2	341	508	96	51	6	3
Indiana.....	0	0	144	400	6	149	1	2
Illinois.....	0	2	387	677	8	36	6	2
Michigan.....	0	0	552	366	12	19	7	10
Wisconsin.....	0	8	119	178	14	8	2	7
<b>West North Central States:</b>								
Minnesota.....	0	0	154	141	4	4	3	3
Iowa.....	2	0	48	127	15	75	0	1
Missouri.....	0	0	57	261	20	40	1	4
North Dakota.....	0	0	14	8	0	8	0	3
South Dakota.....	0	0	15	19	5	19	4	0
Nebraska.....	0	1	31	50	9	60	0	0
Kansas.....	1	1	47	59	4	75	2	3
<b>South Atlantic States:</b>								
Delaware.....	0	0	18	30	0	0	0	0
Maryland <sup>1</sup> .....	0	0	121	104	0	0	7	2
District of Columbia.....	1	0	51	26	0	0	2	0
West Virginia.....	0	2	58	17	3	14	4	0
North Carolina.....	1	0	47	50	2	2	4	1
South Carolina.....	0	2	10	7	0	0	7	1
Georgia.....	0	0	14	89	0	0	15	3
Florida.....	0	0	6	11	1	2	3	2
<b>East South Central States:</b>								
Kentucky.....	0	0	117	76	2	8	16	4
Tennessee.....	0	0	37	68	28	1	10	1
Alabama <sup>1</sup> .....	0	1	27	36	15	8	5	3
Mississippi.....	1	0	7	25	32	27	8	3

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

<sup>2</sup> Typhus fever, week ended Mar. 5, 1932, 1 case in Alabama.

<sup>3</sup> Figures for 1932 are exclusive of Oklahoma City and Tulsa.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 5, 1932, and March 7, 1931—Continued*

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931	Week ended Mar. 5, 1932	Week ended Mar. 7, 1931
<b>West South Central States:</b>								
Arkansas.....	0	0	8	24	22	41	1	3
Louisiana.....	0	0	20	20	2	23	15	3
Oklahoma <sup>1</sup> .....	0	0	35	40	3	84	6	1
Texas.....	0	5	49	42	29	55	4	9
<b>Mountain States:</b>								
Montana.....	0	0	60	44	0	4	0	5
Idaho.....	0	0	3	5	2	5	0	1
Wyoming.....	0	0	4	21	0	2	0	0
Colorado.....	0	1	23	41	6	11	0	0
New Mexico.....	0	0	11	14	2	7	1	0
Arizona.....	0	0	9	1	0	0	0	0
Utah <sup>1</sup> .....	0	0	8	17	0	2	1	0
<b>Pacific States:</b>								
Washington.....	0	1	48	49	18	25	1	1
Oregon.....	0	0	30	37	24	33	1	1
California.....	5	12	143	150	11	71	2	6

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

<sup>1</sup> Figures for 1932 are exclusive Oklahoma City and Tulsa.

### SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Men-ingo-coccus menin-gitis	Diph-theria	Influ-enza	Ma-laria	Mea-sles	Pel-legra	Polio-mye-litis	Scarlet fever	Small-pox	Ty-phoid fever
<i>January, 1932</i>										
California.....	18	332	767	2	1,145	1	8	615	59	14
Kansas.....	3	178	44		274		1	285	8	6
Mississippi.....	5	120	2,394	1,007	17	279	2	106	114	47
Nevada.....	10	2	31		6		0	9	0	1
New Hampshire.....		19	1				3	115		4
Oklahoma <sup>1</sup> .....	4	238	729	42	151	3	3	193	139	43
South Carolina.....		183	2,142	514	180	133	1	62	6	58
South Dakota.....	2	32	163		223		1	45	74	10
Texas.....	3	614	2,263	273			3	366		50
Virginia.....	10	426	2,430	9	444	14	6	453	4	50
Washington.....	2	26	67		1,527		0	228	65	10

<sup>1</sup> Exclusive of Oklahoma City and Tulsa.

<i>January, 1933</i>		Cases	Paratyphoid fever—Continued.	Cases
<b>Actinomycosis:</b>			South Carolina.....	4
California.....		2	Texas.....	5
South Dakota.....		1	Washington.....	1
<b>Chicken pox:</b>			<b>Psittacosis:</b>	
California.....		2,504	California.....	3
Kansas.....		649	Puerperal septicemia:	
Mississippi.....		521	Mississippi.....	20
Nevada.....		24	<b>Rabies in animals:</b>	
Oklahoma <sup>1</sup> .....		111	California.....	35
South Carolina.....		201	Mississippi.....	3
South Dakota.....		101	South Carolina.....	10
Virginia.....		692	<b>Scabies:</b>	
Washington.....		479	Oklahoma <sup>1</sup> .....	34
<b>Dengue:</b>			South Carolina.....	8
Mississippi.....		6	<b>Septic sore throat:</b>	
South Carolina.....		4	California.....	11
<b>Diarrhea:</b>			Kansas.....	4
South Carolina.....		335	Oklahoma <sup>1</sup> .....	23
<b>Diarrhea and dysentery:</b>			South Carolina.....	2
Virginia.....		99	<b>Tetanus:</b>	
<b>Dysentery:</b>			California.....	3
California (amebic).....		7	Oklahoma <sup>1</sup> .....	2
California (bacillary).....		15	<b>Trachoma:</b>	
Mississippi (amebic).....		17	California.....	9
Oklahoma <sup>1</sup> .....		5	Mississippi.....	2
South Dakota.....		1	Oklahoma <sup>1</sup> .....	4
<b>Food poisoning:</b>			South Dakota.....	1
California.....		38	Washington.....	2
<b>German measles:</b>			<b>Trichinosis:</b>	
California.....		40	California.....	10
Kansas.....		6	<b>Tularaemia:</b>	
Washington.....		38	Kansas.....	2
<b>Hookworm disease:</b>			Mississippi.....	1
South Carolina.....		77	Oklahoma <sup>1</sup> .....	1
<b>Impetigo contagiosa:</b>			South Carolina.....	1
Kansas.....		4	Virginia.....	7
<b>Jaundice:</b>			<b>Typhus fever:</b>	
California.....		1	South Carolina.....	1
<b>Leprosy:</b>			Virginia.....	1
California.....		2	<b>Undulant fever:</b>	
<b>Lethargic encephalitis:</b>			California.....	6
California.....		2	Kansas.....	1
South Carolina.....		2	South Carolina.....	1
<b>Mumps:</b>			Virginia.....	2
California.....		581	Washington.....	1
Kansas.....		276	<b>Vincent's angina:</b>	
Mississippi.....		150	Kansas.....	25
Oklahoma <sup>1</sup> .....		65	<b>Whooping cough:</b>	
South Carolina.....		240	California.....	540
South Dakota.....		33	Kansas.....	301
Washington.....		195	Mississippi.....	624
<b>Ophthalmia neonatorum:</b>			Nevada.....	13
Mississippi.....		5	Oklahoma <sup>1</sup> .....	50
South Carolina.....		15	South Carolina.....	130
<b>Paratyphoid fever:</b>			South Dakota.....	60
California.....		1	Virginia.....	1,215
Kansas.....		1	Washington.....	124

<sup>1</sup> Exclusive of Oklahoma City and Tulsa.

**Cases of Certain Communicable Diseases Reported for the Month of January,  
1932, by State Health Officers**

State	Chick- en pox	Diph- theria	Measles	Mumps	Scarlet fever	Small- pox	Tuber- culosis	Ty- phoid and para- typhoid fever	Whoop- ing cough
Maine.....	261	25	2,805	60	172	0	59	9	130
New Hampshire.....		19			115			4	
Vermont.....	298		1,467	419	44	63	115	1	280
Massachusetts.....	1,269	259	1,608	1,314	2,027	38	415	19	910
Rhode Island.....	127	37	4,205	361	180	0	7	0	110
Connecticut.....	594	32	496	345	338	34	137	5	453
New York.....	2,707	618	3,925	1,066	3,504	18	1,527	83	2,327
New Jersey.....	1,256	147	391	341	893	0	374	15	1,214
Pennsylvania.....	4,068	590	5,593	2,521	2,587	0	578	94	3,188
Ohio.....	1,708	454	1,333	1,114	1,076	150	551	40	2,299
Indiana.....	739	361	555	341	575	84	238	20	335
Illinois.....	1,864	590	279	278	1,668	86	858	43	1,456
Michigan.....	1,297	164	745	1,163	1,157	44	586	24	1,295
Wisconsin.....	1,845	98	544	1,112	422	13	138	5	1,068
Minnesota.....	444	84	180		443	22	139	7	111
Iowa.....	267	92	14	40	227	269	26	4	108
Missouri.....	465	315	96	56	463	121	220	9	749
North Dakota.....	176	5	185	27	82	107	14	6	14
South Dakota.....	101	32	223	33	45	74	3	10	60
Nebraska.....	177	68	81	110	141	32	23	3	52
Kansas.....	649	178	274	276	285	8	20	7	301
Delaware.....	93	25	5	35	77	0	8	0	37
Maryland.....	478	176	69	315	440	0	147	24	789
District of Columbia.....	60	79	6		95	1	70	6	71
Virginia.....	692	426	444		453	4	127	50	1,215
West Virginia.....	281	214	1,543	38	238	11	42	60	326
North Carolina.....	575	217	545		294	7		36	1,373
South Carolina.....	201	183	180	240	62	6	105	62	130
Georgia.....	106	77	17	54	109	0	110	44	77
Florida.....	16	67	36	26	19	2	55	24	27
Kentucky <sup>1</sup> .....									
Tennessee.....	151	198	71	78	311	66	201	82	259
Alabama.....	183	193	39	127	183	194	351	79	118
Mississippi.....	521	120	17	150	106	114	99	47	624
Arkansas.....	76	68	12	33	49	64	15	22	46
Louisiana.....	13	147	47	8	75	19	115	51	99
Oklahoma <sup>2</sup> .....	111	238	151	65	193	139	86	43	50
Texas.....		614			365			55	
Montana.....	154	11	481	9	161	10	54	8	41
Idaho.....	60	18	11	42	66	35	19	2	14
Wyoming.....	34	2	7	35	51	0	11	2	8
Colorado.....	284	47	58	148	215	14	50	5	62
New Mexico.....	101	75	40	44	56	5	78	7	37
Arizona.....	234	22	15	6	41	3	106	3	25
Utah <sup>3</sup> .....									
Nevada.....	24	2	6		9	0	7	1	13
Washington.....	479	26	1,527	195	223	65	93	11	124
Oregon.....	275	10	107	130	193	87	47	9	51
California.....	2,504	332	1,145	581	615	59	919	15	540

<sup>1</sup> Pulmonary.<sup>2</sup> Reports received weekly.<sup>3</sup> Exclusive of Oklahoma City and Tulsa.



## Case Rates per 100,000 Population (Annual Basis) for the Month of January, 1932

State	Chicken pox	Diph- theria	Measles	Mumps	Scarlet fever	Small- pox	Tuber- culosis	Ty- phoid and para- typhoid fever	Whoop- ing cough
Maine.....	384	37	4,129	88	253	0	87	13	191
New Hampshire.....	-----	48	-----	-----	290	-----	-----	10	-----
Vermont.....	977	-----	4,811	1,473	144	207	149	3	918
Massachusetts.....	348	71	440	361	556	10	114	5	250
Rhode Island.....	215	63	7,113	611	304	0	12	0	186
Connecticut.....	429	23	358	249	244	25	99	4	327
New York.....	248	57	360	98	321	2	140	8	213
New Jersey.....	357	42	108	97	254	0	106	4	345
Pennsylvania.....	493	71	678	305	313	0	70	11	386
Ohio.....	298	79	233	195	345	26	98	7	402
Indiana.....	266	130	200	123	207	30	86	7	121
Illinois.....	283	90	42	42	253	13	130	7	221
Michigan.....	307	39	176	275	274	10	139	6	306
Wisconsin.....	731	39	216	441	167	5	55	2	419
Minnesota.....	203	38	82	-----	202	10	63	3	51
Iowa.....	127	44	7	19	108	128	12	2	51
Missouri.....	150	102	31	18	149	39	71	3	242
North Dakota.....	304	9	319	47	142	185	24	10	24
South Dakota.....	170	54	376	56	76	125	5	17	101
Nebraska.....	151	49	69	94	120	27	20	3	44
Kansas.....	405	111	171	172	178	5	12	4	188
Delaware.....	456	122	24	171	377	0	39	-----	181
Maryland.....	341	126	49	225	314	0	105	17	563
District of Columbia.....	143	189	14	-----	227	2	167	14	170
Virginia.....	336	207	215	-----	220	2	62	24	589
West Virginia.....	188	143	1,034	25	159	7	28	40	278
North Carolina.....	209	79	198	-----	107	3	-----	13	499
South Carolina.....	136	124	122	162	42	4	71	42	88
Georgia.....	43	31	7	22	44	0	45	18	31
Florida.....	12	52	28	20	15	2	42	18	21
Kentucky <sup>1</sup> .....	-----	-----	-----	-----	-----	-----	-----	-----	-----
Tennessee.....	67	88	32	35	138	29	89	36	115
Alabama.....	80	85	17	56	80	85	154	35	52
Mississippi.....	302	70	10	87	61	66	57	27	362
Arkansas.....	48	43	8	21	31	40	13	14	29
Louisiana.....	7	81	26	4	41	10	163	28	55
Oklahoma <sup>2</sup> .....	63	135	85	37	109	79	49	24	28
Texas.....	-----	121	-----	-----	72	-----	-----	11	-----
Montana.....	338	24	1,056	20	354	22	119	18	90
Idaho.....	158	34	29	111	174	92	121	5	37
Wyoming.....	175	10	36	180	262	0	15	10	41
Colorado.....	320	53	65	167	242	16	56	6	70
New Mexico.....	277	205	110	121	153	14	214	19	101
Arizona.....	617	58	40	16	108	8	277	8	66
Utah <sup>3</sup> .....	-----	-----	-----	-----	-----	-----	-----	-----	-----
Nevada.....	305	25	76	-----	114	0	89	12	165
Washington.....	356	19	1,134	145	166	48	60	8	92
Oregon.....	333	12	129	157	161	105	57	11	62
California.....	496	66	227	115	122	12	182	8	107

<sup>1</sup> Pulmonary.<sup>2</sup> Reports received weekly.<sup>3</sup> Exclusive of Oklahoma City and Tulsa.

**ADMISSIONS TO HOSPITALS FOR THE INSANE, APRIL, 1930**

Reports for the month of April, 1930, showing new admissions to hospitals for the care and treatment of the insane, were received by the Public Health Service from 113 hospitals, located in 37 States, the District of Columbia, and the Territory of Hawaii. The 113 hospitals had 179,759 patients on April 30, 1930, 95,918 males and 83,841 females, the ratio being 114 males per 100 females.

The following table gives the number of new admissions for the month of April, 1930, by psychoses:

Psychoses	Number of first admissions		
	Male	Female	Total
1. Traumatic psychoses.....	9	0	9
2. Senile psychoses.....	170	131	301
3. Psychoses with cerebral arteriosclerosis.....	202	125	327
4. General paralysis.....	213	50	263
5. Psychoses with cerebral syphilis.....	27	8	35
6. Psychoses with Huntington's chorea.....	2	3	5
7. Psychoses with brain tumor.....	1	1	2
8. Psychoses with other brain or nervous disease.....	27	15	42
9. Alcoholic psychoses.....	105	16	121
10. Psychoses due to drugs and other exogenous toxins.....	10	8	18
11. Psychoses with pellagra.....	15	25	40
12. Psychoses with other somatic diseases.....	35	61	96
13. Manic-depressive psychoses.....	212	263	475
14. Involution melancholia.....	21	46	67
15. Dementia praecox (schizophrenia).....	394	317	711
16. Paranoia and paranoid conditions.....	26	29	55
17. Epileptic psychoses.....	55	31	86
18. Psychoneuroses and neuroses.....	33	27	60
19. Psychoses with psychopathic personality.....	23	9	32
20. Psychoses with mental deficiency.....	66	40	106
21. Undiagnosed psychoses.....	138	108	246
22. Without psychosis.....	209	56	265
Total.....	1,993	1,369	3,362

During the month of April, 1930, there were 3,362 new admissions to the hospitals, 59.3 per cent of these new admissions being males and 40.7 per cent females, the ratio being 146 males per 100 females. Five hundred and eleven of the new admissions were reported as being undiagnosed or "without psychosis." There were 2,851 new admissions for whom provisional diagnoses were made. Of these 2,851 patients, cases of dementia praecox constituted 24.9 per cent; manic-depressive psychoses, 16.7 per cent; psychoses with cerebral arteriosclerosis, 11.5 per cent; senile psychoses, 10.6 per cent; and general paralysis, 9.2 per cent. These five classes accounted for 2,077 cases, or 72.9 per cent of the new admissions for whom diagnoses were made.

The following table shows the number of patients in the hospitals and on parole on April 30, 1930:

	Male	Female	Total
Patients on books Apr. 30, 1930:			
In hospitals.....	86,630	76,682	163,312
On parole or otherwise absent, but still on books.....	9,288	7,159	16,447
Total.....	95,918	83,841	179,759

Of the 179,759 patients, 9,288 males and 7,159 females were on parole or otherwise absent but still on the books at the end of the month—9.7 per cent of the males, 8.5 per cent of the females, and 9.1 per cent of the total number of patients.

#### GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 98 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 34,050,000. The estimated population of the 91 cities reporting deaths is more than 32,490,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

*Weeks ended February 27, 1932, and February 28, 1931*

	1932	1931 <sup>1</sup>	Estimated expectancy
<i>Cases reported</i>			
Diphtheria:			
46 States.....	1,201	1,073	-----
98 cities.....	416	447	785
Measles:			
45 States.....	11,841	13,850	-----
98 cities.....	3,718	4,515	-----
Meningococcus meningitis:			
46 States.....	94	167	-----
98 cities.....	38	96	-----
Poliomyelitis:			
46 States.....	29	22	-----
Scarlet fever:			
46 States.....	6,588	6,222	-----
98 cities.....	2,873	2,396	1,613
Smallpox:			
46 States.....	347	965	-----
98 cities.....	28	129	50
Typhoid fever:			
46 States.....	180	146	-----
98 cities.....	32	45	29
<i>Deaths reported</i>			
Influenza and pneumonia:			
91 cities.....	1,188	1,609	-----
Smallpox:			
91 cities.....	0	0	-----

<sup>1</sup> The figures published in the Public Health Reports (Mar. 11, 1932, p. 623) for cities as for the week ended Feb. 21, 1931, are for the week ended Feb. 23, 1931.

## City reports for week ended February 27, 1932

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

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1923 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	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases re- ported	Mumps, cases re- ported	Pneu- monia, deaths reported
		Cases, estimated expect- ancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND								
Maine:								
Portland.....	2	0	0	2	0	206	0	4
New Hampshire:								
Concord.....	0	0	0	0	0	0	0	1
Manchester.....	0	0	0	0	3	0	0	2
Nashua.....	0	1	1	0	0	1	0	0
Vermont:								
Barre.....	0	0	0	0	0	0	0	2
Burlington.....	0	0	0	0	0	4	0	0
Massachusetts:								
Boston.....	51	26	17	6	3	16	19	35
Fall River.....	1	3	1	0	0	7	1	0
Springfield.....	17	4	0	0	1	8	16	1
Worcester.....	2	2	7	0	0	0	19	6
Rhode Island:								
Pawtucket.....	0	1	0	0	0	0	0	0
Providence.....	10	8	1	0	0	393	4	11
Connecticut:								
Bridgeport.....	3	5	0	0	0	0	0	1
Hartford.....	12	4	1	0	0	0	23	7
New Haven.....	18	1	0	0	2	0	11	12
MIDDLE ATLANTIC								
New York:								
Buffalo.....	64	11	3	2	9	7	23	
New York.....	262	188	126	322	45	100	135	277
Rochester.....	18	5	1	0	0	458	16	4
Syracuse.....	26	2	0	0	0	250	14	1
New Jersey:								
Camden.....	11	5	5	0	3	5	1	
Newark.....	69	13	6	47	3	3	54	14
Trenton.....	9	3	0	10	1	0	4	2
Pennsylvania:								
Philadelphia.....	194	65	13	16	12	9	62	45
Pittsburgh.....	49	18	9	23	25	216	45	50
Reading.....	37	1	0	0	0	6	1	2
Scranton.....	4	0	0	0	4	1	0	
EAST NORTH CENTRAL								
Ohio:								
Cincinnati.....	13	7	1	2	0	0	7	
Cleveland.....	96	30	10	92	4	481	113	19
Columbus.....	2	2	3	335	5	1	0	5
Toledo.....	30	4	1	15	13	26	1	6
Indiana:								
Fort Wayne.....	3	2	8	0	0	0	1	
Indianapolis.....	39	6	0	4	5	80	26	
South Bend.....	2	1	1	1	0	0	0	
Terre Haute.....	3	1	1	1	0	0	1	
Illinois:								
Chicago.....	103	91	29	79	27	113	11	81
Peoria.....	5	0	0	3	1	0	7	
Springfield.....	1	1	1	4	1	6	2	

## City reports for week ended February 27, 1932—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases re- ported	Mumps, cases re- ported	Pneu- monia, deaths reported
		Cases, estimated expect- ancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued								
Michigan:								
Detroit.....	77	43	17	43	6	45	29	26
Flint.....	11	2	2	89	0	61	90	3
Grand Rapids....	3	0	1	4	1	85	8	2
Wisconsin:								
Kenosha.....	5	0	0	-----	0	0	1	1
Madison.....	12	0	2	-----	-----	3	0	-----
Milwaukee.....	105	14	2	10	9	177	40	9
Racine.....	25	2	0	1	1	21	100	2
Superior.....	0	0	0	-----	0	0	27	0
WEST NORTH CENTRAL								
Minnesota:								
Duluth.....	1	0	0	-----	0	0	0	7
Minneapolis....	19	13	5	-----	8	3	27	17
St. Paul.....	14	6	0	1	1	1	7	8
Iowa:								
Davenport.....	3	0	0	-----	-----	0	0	-----
Des Moines.....	0	1	3	-----	-----	1	0	-----
Sioux City.....	0	0	0	-----	-----	0	2	-----
Waterloo.....	8	0	0	-----	-----	0	1	-----
Missouri:								
Kansas City....	26	5	2	-----	0	2	3	22
St. Joseph.....	12	0	1	-----	0	0	0	7
St. Louis.....	47	37	19	-----	-----	2	6	9
North Dakota:								
Fargo.....	2	0	0	-----	0	37	0	0
Grand Forks....	0	0	0	-----	-----	0	0	-----
South Dakota:								
Sioux Falls....	0	0	0	-----	-----	0	0	-----
Nebraska:								
Omaha.....	3	6	5	-----	0	0	2	9
Kansas:								
Topeka.....	22	1	0	1	1	1	0	2
Wichita.....	18	1	3	-----	0	73	1	3
SOUTH ATLANTIC								
Delaware:								
Wilmington.....	4	1	0	-----	0	1	1	2
Maryland:								
Baltimore.....	132	20	8	38	5	2	113	34
Cumberland.....	0	0	0	4	0	5	0	1
Frederick.....	1	0	1	-----	0	1	0	0
District of Columbia:								
Washington.....	37	14	11	3	3	2	0	16
Virginia:								
Lynchburg.....	2	0	0	-----	0	0	0	0
Norfolk.....	14	0	3	-----	0	0	1	3
Richmond.....	7	3	2	-----	3	0	0	2
Roanoke.....	6	1	2	-----	0	0	0	1
West Virginia:								
Charleston.....	27	0	0	3	0	90	0	2
Huntington.....	0	-----	0	-----	0	0	0	0
Wheeling.....	2	0	0	-----	0	1	0	4
North Carolina:								
Raleigh.....	5	0	0	-----	0	29	0	4
Wilmington.....	2	0	0	-----	0	0	0	2
Winston-Salem....	11	1	2	-----	0	1	2	4
South Carolina:								
Charleston.....	0	0	0	102	0	0	0	2
Columbia.....	0	1	0	-----	0	0	0	0
Greenville.....	0	0	0	-----	0	0	0	0
Georgia:								
Atlanta.....	4	3	5	21	1	0	2	10
Brunswick.....	0	0	0	-----	0	0	0	1
Savannah.....	2	0	0	20	2	12	0	1
Florida:								
Miami.....	0	2	3	-----	0	0	0	3
Tampa.....	2	2	4	-----	2	0	0	2

## City reports for week ended February 27, 1932—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases re- ported	Mumps, cases re- ported	Pneu- monia, deaths reported
		Cases, estimated expect- ancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL								
Kentucky:								
Covington.....	0	1	0	-----	0	0	0	2
Lexington.....	4	-----	0	1	0	3	12	0
Tennessee:								
Memphis.....	4	3	5	-----	2	0	0	4
Nashville.....	1	1	0	-----	3	0	0	7
Alabama:								
Birmingham.....	1	3	1	7	2	0	3	8
Mobile.....	0	0	2	-----	0	0	0	1
Montgomery.....	5	1	0	-----	-----	0	13	-----
WEST SOUTH CENTRAL								
Arkansas:								
Fort Smith.....	0	0	0	-----	-----	0	0	-----
Little Rock.....	3	1	1	-----	0	0	5	2
Louisiana:								
New Orleans.....	0	14	15	4	4	0	0	4
Shreveport.....	3	0	0	-----	0	52	5	4
Oklahoma:								
Muskogee.....	0	-----	0	29	0	0	0	0
Oklahoma City.....	0	2	2	300	0	0	0	6
Texas:								
Dallas.....	8	6	7	32	1	18	0	16
Fort Worth.....	16	3	3	-----	0	0	0	2
Galveston.....	0	1	3	-----	1	0	0	1
Houston.....	1	5	10	-----	1	1	0	5
San Antonio.....	1	3	0	-----	0	0	1	0
MOUNTAIN								
Montana:								
Billings.....	1	0	0	-----	0	2	0	0
Great Falls.....	4	0	0	1	3	0	0	2
Helena.....	0	0	0	-----	0	5	0	0
Missoula.....	0	0	0	75	0	0	0	0
Idaho:								
Boise.....	0	0	0	-----	0	0	0	1
Colorado:								
Denver.....	11	7	1	-----	3	21	26	16
Pueblo.....	30	1	0	-----	0	1	0	1
New Mexico:								
Albuquerque.....	3	1	0	-----	0	34	14	1
Arizona:								
Phoenix.....	0	-----	0	-----	2	0	0	2
Utah:								
Salt Lake City.....	16	1	0	-----	2	0	0	5
Nevada:								
Reno.....	0	0	0	-----	0	0	0	1
PACIFIC								
Washington:								
Seattle.....	11	5	0	-----	-----	447	0	-----
Spokane.....	10	3	0	-----	-----	1	0	-----
Tacoma.....	6	2	0	-----	0	11	5	2
Oregon:								
Portland.....	13	6	0	9	1	25	8	8
Salem.....	4	0	0	33	0	0	2	0
California:								
Los Angeles.....	205	30	33	113	5	1	22	15
Sacramento.....	30	2	0	2	1	136	0	20
San Francisco.....	84	13	2	7	0	85	3	8

## City reports for week ended February 27, 1932—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expe- tancy	Cases re- ported	Deaths re- ported		
NEW ENGLAND											
Maine:											
Portland.....	4	4	0	0	0	0	0	0	0	6	25
New Hampshire:											
Concord.....	1	4	0	0	0	0	0	0	0	0	10
Manchester.....	2	14	0	0	0	0	0	0	0	0	17
Nashua.....	0	0	0	0	0	0	0	0	0	0	-----
Vermont:											
Barre.....	0	0	0	0	-----	0	0	0	0	0	7
Burlington.....	1	2	-----	0	-----	0	0	0	0	0	15
Massachusetts:											
Boston.....	90	164	0	0	0	10	1	0	0	19	243
Fall River.....	4	2	0	0	0	2	0	0	0	1	30
Springfield.....	10	8	0	0	0	0	1	0	0	6	32
Worcester.....	11	33	0	2	0	2	0	0	0	7	-----
Rhode Island:											
Pawtucket.....	2	0	0	0	0	0	0	0	0	0	17
Providence.....	15	24	0	0	0	2	0	0	0	12	-----
Connecticut:											
Bridgeport.....	12	3	0	0	0	1	0	0	0	0	37
Hartford.....	7	9	0	0	0	2	0	1	0	11	43
New Haven.....	6	30	0	0	0	2	1	0	0	10	50
MIDDLE ATLANTIC											
New York:											
Buffalo.....	29	145	0	3	0	6	0	0	0	41	135
New York.....	302	924	0	0	0	91	7	6	0	175	1,694
Rochester.....	10	61	0	0	0	1	0	0	0	2	81
Syracuse.....	13	32	0	0	0	2	0	0	0	44	40
New Jersey:											
Camden.....	6	49	0	0	0	1	0	0	0	3	31
Newark.....	41	37	0	0	0	5	0	0	0	35	94
Trenton.....	6	9	0	0	0	3	0	0	0	6	37
Pennsylvania:											
Philadelphia.....	103	233	0	0	0	34	1	1	0	277	499
Pittsburgh.....	32	72	0	0	0	9	1	1	1	46	249
Reading.....	6	7	0	0	0	1	0	0	0	18	24
Scranton.....	-----	28	-----	0	0	0	-----	0	0	3	-----
EAST NORTH CENTRAL											
Ohio:											
Cincinnati.....	27	36	0	1	0	7	0	0	0	4	124
Cleveland.....	60	40	1	0	0	14	0	0	0	188	207
Columbus.....	11	6	1	0	0	1	1	0	0	66	74
Toledo.....	13	5	0	0	0	7	0	0	0	59	92
Indiana:											
Fort Wayne.....	5	3	1	0	0	0	0	2	0	4	33
Indianapolis.....	16	4	8	0	0	2	0	0	0	32	-----
South Bend.....	5	5	1	0	0	0	0	0	0	3	14
Terre Haute.....	2	1	0	0	0	0	0	0	0	2	27
Illinois:											
Chicago.....	152	218	1	0	0	39	2	1	0	150	802
Peoria.....	-----	0	-----	0	0	0	-----	0	0	11	29
Springfield.....	3	7	0	0	0	1	0	0	0	11	17
Michigan:											
Detroit.....	124	233	2	0	0	11	0	0	0	141	233
Flint.....	17	5	0	0	0	2	0	4	0	12	34
Grand Rapids.....	14	4	1	0	0	1	1	0	0	7	32
Wisconsin:											
Kenosha.....	2	1	0	0	0	0	0	0	0	0	4
Madison.....	4	3	0	0	-----	0	0	0	-----	1	-----
Milwaukee.....	35	60	0	0	0	5	0	0	0	107	115
Racine.....	5	1	0	0	0	2	0	0	0	0	21
Superior.....	2	0	0	0	0	0	0	0	0	0	4
WEST NORTH CENTRAL											
Minnesota:											
Duluth.....	10	1	0	0	0	1	1	0	0	0	20
Minneapolis.....	44	61	0	0	0	1	0	0	0	16	129
St. Paul.....	29	21	1	0	0	1	0	0	0	8	61

## City reports for week ended February 27, 1932—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
WEST NORTH CEN- TRAL—continued											
Iowa:											
Davenport.....	2	7	1	0	-----	-----	0	0	-----	0	-----
Des Moines.....	8	8	2	0	-----	-----	0	0	-----	0	33
Sioux City.....	2	0	1	2	-----	-----	0	0	-----	2	-----
Waterloo.....	1	2	0	1	-----	-----	0	0	-----	3	-----
Missouri:											
Kansas City.....	25	15	0	0	0	4	0	1	0	31	112
St. Joseph.....	2	2	0	0	0	2	0	0	0	1	29
St. Louis.....	45	21	2	2	0	10	0	0	0	60	231
North Dakota:											
Fargo.....	2	1	0	0	0	0	0	0	0	0	10
Grand Forks.....	1	0	1	0	-----	-----	0	0	-----	0	-----
South Dakota:											
Sioux Falls.....	1	0	0	1	-----	-----	0	0	-----	0	5
Nebraska:											
Omaha.....	6	6	4	5	0	2	0	0	0	5	57
Kansas:											
Topeka.....	2	1	0	0	0	0	0	0	0	10	15
Wichita.....	2	0	2	0	0	0	0	0	0	0	26
SOUTH ATLANTIC											
Delaware:											
Wilmington.....	6	1	0	0	0	3	0	0	0	3	67
Maryland:											
Baltimore.....	39	83	0	0	0	11	1	2	1	122	244
Cumberland.....	1	6	0	0	0	1	0	0	0	1	17
Frederick.....	0	2	0	0	0	0	0	0	0	8	4
District of Col.:											
Washington.....	27	22	0	0	0	6	0	1	0	19	173
Virginia:											
Lynchburg.....	0	3	0	0	0	0	0	1	0	8	10
Norfolk.....	2	3	0	0	0	2	0	0	0	3	-----
Richmond.....	4	10	0	0	0	2	0	0	0	0	50
Roanoke.....	1	2	0	0	0	1	0	0	0	0	11
West Virginia:											
Charleston.....	1	0	0	0	0	1	1	0	0	5	19
Huntington.....	-----	2	-----	0	0	0	0	0	0	0	-----
Wheeling.....	2	2	0	0	0	1	0	1	0	11	31
North Carolina:											
Raleigh.....	1	3	0	0	0	1	0	0	0	2	28
Wilmington.....	0	0	0	0	0	0	0	0	0	10	14
Winston-Salem.....	1	5	0	0	0	4	0	0	0	20	27
South Carolina:											
Charleston.....	0	1	0	0	0	1	0	0	0	0	23
Columbia.....	0	0	0	0	0	0	0	0	0	0	-----
Greenville.....	-----	2	0	0	0	0	-----	0	0	0	-----
Georgia:											
Atlanta.....	6	4	1	0	0	5	0	1	0	2	85
Brunswick.....	0	0	0	0	0	0	0	0	0	0	1
Savannah.....	0	0	0	0	0	1	0	2	1	8	41
Florida:											
Miami.....	1	0	0	0	0	1	1	0	0	4	26
Tampa.....	1	1	0	0	0	1	1	0	0	0	24
EAST SOUTH CENTRAL											
Kentucky:											
Covington.....	2	0	0	0	0	0	0	0	0	0	17
Lexington.....	-----	0	-----	0	0	1	-----	0	0	1	11
Tennessee:											
Memphis.....	12	11	2	3	0	3	0	0	0	13	74
Nashville.....	3	2	1	0	0	4	0	0	1	4	53
Alabama:											
Birmingham.....	4	4	1	0	0	6	0	2	0	1	69
Mobile.....	1	3	0	0	0	2	1	0	1	0	20
Montgomery.....	0	1	0	0	-----	-----	0	0	-----	0	-----



## City reports for week ended February 27, 1932—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re-ported	Typhoid fever			Whoop- ing cough, cases re-ported	Deaths, all causes
	Cases, esti- mated expec- tancy	Cases re- ported	Cases, esti- mated expec- tancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expec- tancy	Cases re- ported	Deaths re- ported		
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith.....	1	0	0	0			0	0		0	
Little Rock.....	1	0	1	0	0	1	0	0	0	0	3
Louisiana:											
New Orleans.....	10	8	0	1	0	18	2	1	0	1	141
Shreveport.....	2	2	1	0	0	3	1	0	0	4	36
Oklahoma:											
Muskogee.....		4		0	0	0		0	0	0	
Oklahoma City.....	3	6	2	0	0	3	0	0	0	0	35
Texas:											
Dallas.....	6	3	1	0	0	2	1	0	0	5	75
Forth Worth.....	4	3	3	2	0	2	0	1	0	0	31
Galveston.....	0	1	0	0	0	0	0	0	0	0	10
Houston.....	2	1	5	1	0	2	0	1	2	0	67
San Antonio.....	1	2	0	0	0	0	0	0	0	0	
MOUNTAIN											
Montana:											
Billings.....	0	0	0	0	0	0	0	0	0	0	10
Great Falls.....	3	0	0	0	0	0	0	0	0	1	10
Helena.....	0	0	0	0	0	0	0	0	0	0	5
Missoula.....	0	2	0	0	0	0	0	0	0	0	6
Idaho: Boise.....	0	1	1	0	0	0	0	0	0	0	
Colorado:											
Denver.....	16	14	1	0	0	4	1	0	0	9	33
Pueblo.....	0	1	0	0	0	0	1	0	0	4	9
New Mexico:											
Albuquerque.....	0	1	0	0	0	4	0	0	0	0	12
Arizona:											
Phoenix.....	1	0	1	0	0	6	0	0	0	0	
Utah:											
Salt Lake City.....	2	2	0	0	0	1	0	0	0	0	43
Nevada: Reno.....	0	0	0	0	0	0	0	0	0	0	6
PACIFIC											
Washington:											
Seattle.....	12	2	3	3			0	0		1	
Spokane.....	6	0	8	0			0	0		0	
Tacoma.....	5	3	3	0	0	2	0	0	0	0	30
Oregon:											
Portland.....	6	3	13	8	0	2	0	0	0	7	69
Salem.....	0	1		0	0	0		0	0	0	
California:											
Los Angeles.....	45	49	3	3	0	27	2	0	0	21	333
Sacramento.....	3	1	0	0	0	1	0	0	0	8	48
San Francisco.....	28	10	1	1	0	16	0	3	0	13	170

Division, State, and city	Meningo- coccus meningitis		Lethargic en- cephalitis		Pellagra		Poliomyelitis (infan- tile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases esti- mated expect- ancy	Cases	Deaths
NEW ENGLAND									
Massachuettis: Boston.....	2	0	0	0	0	0	0	0	0
Rhode Island: Providence.....	0	0	0	0	0	1	0	0	0
Connecticut: Bridgeport.....	1	0	0	0	0	0	0	0	0

## City reports for week ended February 27, 1932—Continued

Division, State, and city	Meningo- coccus meningitis		Lethargic en- cephalitis		Pellagra		Poliomyelitis (infan- tile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases esti- mated expect- ancy	Cases	Deaths
<b>MIDDLE ATLANTIC</b>									
New York:									
New York.....	4	2	2	0	0	0	1	2	0
Syracuse.....	1	0	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia.....	1	1	0	0	0	0	0	0	0
Pittsburgh.....	3	0	0	0	0	0	0	0	0
<b>EAST NORTH CENTRAL</b>									
Ohio:									
Columbus.....	1	1	0	0	0	0	0	0	0
Indiana:									
Fort Wayne.....	1	1	0	0	0	0	0	0	0
Indianapolis.....	5	1	0	0	0	0	0	0	0
Terre Haute.....	1	1	0	0	0	0	0	0	0
Illinois:									
Chicago.....	6	3	2	0	0	0	0	0	0
Wisconsin:									
Milwaukee.....	1	1	2	0	0	0	0	0	0
Racine.....	1	0	0	0	0	0	0	0	0
<b>WEST NORTH CENTRAL</b>									
Missouri:									
St. Louis.....	1	0	0	0	0	0	0	0	0
<b>SOUTH ATLANTIC</b>									
Maryland:									
Baltimore.....	2	0	0	0	0	0	1	0	0
District of Columbia:									
Washington.....	1	0	0	0	1	0	0	0	0
Virginia:									
Roanoke.....	0	0	0	0	0	1	0	0	0
North Carolina:									
Wilmington.....	1	1	0	0	0	0	0	0	0
Winston-Salem.....	0	0	0	0	1	0	0	0	0
South Carolina:									
Charleston <sup>1</sup> .....	0	0	0	0	3	0	0	0	0
Georgia:									
Atlanta.....	1	1	0	0	0	0	0	0	0
Savannah.....	0	0	0	0	3	0	0	0	0
<b>EAST SOUTH CENTRAL</b>									
Tennessee:									
Memphis.....	1	1	0	1	0	1	0	0	0
Alabama:									
Birmingham.....	0	0	0	0	1	1	0	0	0
Mobile.....	0	0	0	0	0	1	0	0	0
<b>WEST SOUTH CENTRAL</b>									
Oklahoma:									
Oklahoma City.....	0	0	0	0	0	1	0	0	0
Texas:									
Dallas.....	0	0	0	0	1	1	0	0	0
<b>MOUNTAIN</b>									
Colorado:									
Denver.....	2	0	0	0	0	0	0	0	0
<b>PACIFIC</b>									
California:									
Los Angeles.....	1	0	0	0	0	0	0	1	0

<sup>1</sup> Dengue, 3 cases at Charleston, S. C.

The following table gives the rates per 100,000 population for 98 cities for the 5-week period ended February 27, 1932, compared with those for a like period ended February 28, 1931. The population figures used in computing the rates are estimated mid-year populations for 1931 and 1932, respectively, derived from the 1930 census. The 98 cities reporting cases have an estimated aggregate population of more than 34,000,000. The 91 cities reporting deaths have more than 32,400,000 estimated population.

*Summary of weekly reports from cities, January 24 to February 27, 1932—Annual rates per 100,000 population, compared with rates for the corresponding period of 1931<sup>1</sup>*

## DIPHTHERIA CASE RATES

	Week ended—									
	Jan. 30, 1932	Jan. 31, 1931	Feb. 6, 1932	Feb. 7, 1931	Feb. 13, 1932	Feb. 14, 1931	Feb. 20, 1932	Feb. 21, 1931	Feb. 27, 1932	Feb. 28, 1931
98 cities .....	84	<sup>2</sup> 88	<sup>3</sup> 79	<sup>2</sup> 78	<sup>4</sup> 79	67	72	<sup>9</sup> 68	64	70
New England.....	96	106	48	84	<sup>5</sup> 65	75	108	70	65	89
Middle Atlantic.....	69	68	<sup>6</sup> 73	53	75	53	65	64	72	56
East North Central.....	68	110	79	96	74	85	57	66	45	78
West North Central.....	99	109	81	99	89	55	85	59	66	55
South Atlantic.....	120	<sup>2</sup> 73	84	<sup>2</sup> 75	59	59	88	47	69	77
East South Central.....	116	70	<sup>7</sup> 94	53	87	53	75	59	46	59
West South Central.....	204	183	152	156	168	118	158	186	119	132
Mountain.....	43	70	60	78	103	78	52	35	9	87
Pacific.....	63	45	72	69	<sup>8</sup> 78	49	47	59	67	57

## MEASLES CASE RATES

98 cities .....	334	<sup>2</sup> 418	<sup>3</sup> 448	<sup>2</sup> 473	<sup>4</sup> 433	521	533	<sup>9</sup> 668	571	703
New England.....	1,922	438	2,322	502	<sup>5</sup> 2,019	534	1,589	541	1,510	635
Middle Atlantic.....	149	306	<sup>6</sup> 228	353	253	398	384	652	406	645
East North Central.....	210	142	321	151	364	183	577	254	590	300
West North Central.....	114	1,521	172	1,489	182	1,314	197	1,087	226	874
South Atlantic.....	71	<sup>1</sup> 1,034	196	<sup>2</sup> 1,296	245	1,820	359	2,206	282	2,805
East South Central.....	23	916	<sup>7</sup> 0	1,034	17	904	12	1,134	0	1,051
West South Central.....	115	17	198	3	320	17	251	24	234	24
Mountain.....	509	496	284	1,123	198	687	138	1,666	250	1,210
Pacific.....	938	110	1,138	112	<sup>8</sup> 996	169	1,125	243	1,296	223

## SCARLET FEVER CASE RATES

98 cities .....	336	<sup>2</sup> 337	<sup>3</sup> 349	<sup>2</sup> 320	<sup>4</sup> 391	348	417	<sup>9</sup> 346	441	373
New England.....	614	519	705	534	<sup>5</sup> 634	683	738	589	673	606
Middle Atlantic.....	416	328	<sup>6</sup> 447	304	546	322	631	342	604	381
East North Central.....	388	377	325	331	385	375	356	353	372	364
West North Central.....	212	386	284	480	235	474	241	497	248	509
South Atlantic.....	214	<sup>1</sup> 313	245	<sup>2</sup> 305	239	320	231	305	284	364
East South Central.....	127	517	<sup>7</sup> 143	423	127	382	75	534	121	558
West South Central.....	92	112	106	88	49	105	86	139	56	125
Mountain.....	207	322	250	261	172	400	267	296	172	305
Pacific.....	89	143	116	145	<sup>8</sup> 120	123	128	94	124	146

## SMALLPOX CASE RATES

98 cities .....	5	<sup>2</sup> 17	<sup>3</sup> 2	<sup>2</sup> 23	<sup>4</sup> 4	18	4	<sup>9</sup> 20	4	20
New England.....	14	0	2	0	<sup>5</sup> 2	0	5	0	5	0
Middle Atlantic.....	0	0	<sup>6</sup> 0	2	0	0	0	3	1	0
East North Central.....	2	25	0	12	1	10	1	13	1	11
West North Central.....	11	84	9	151	11	84	13	128	19	128
South Atlantic.....	0	<sup>1</sup> 0	2	<sup>2</sup> 0	0	0	0	2	0	0
East South Central.....	6	18	<sup>7</sup> 0	29	6	12	29	18	17	23
West South Central.....	16	51	13	61	20	132	7	51	7	64
Mountain.....	9	0	0	44	17	0	0	44	0	9
Pacific.....	13	18	4	24	<sup>8</sup> 20	29	21	22	13	39

See footnotes at end of table.

Summary of weekly reports from cities, January 24 to February 27, 1932—Annual rates per 100,000 population, compared with rates for the corresponding period of 1931<sup>1</sup>—Continued

## TYPHOID FEVER CASE RATES

	Week ended—									
	Jan. 30, 1932	Jan. 31, 1931	Feb. 6, 1932	Feb. 7, 1931	Feb. 13, 1932	Feb. 14, 1931	Feb. 20, 1932	Feb. 21, 1931	Feb. 27, 1932	Feb. 28, 1931
98 cities.....	5	2 5	3 5	2 4	4 6	3	3	4	5	7
New England.....	2	5	2	2	5 2	2	0	0	2	5
Middle Atlantic.....	7	2	4	1	3	2	4	3	4	6
East North Central.....	1	1	4	2	2	1	3	0	4	3
West North Central.....	6	13	2	2	9	2	0	4	2	11
South Atlantic.....	16	2 8	4	2 18	16	0	10	10	16	22
East South Central.....	17	18	3 1	6	58	29	0	0	12	6
West South Central.....	3	14	23	24	3	14	3	7	7	14
Mountain.....	0	0	0	0	0	0	0	9	0	0
Pacific.....	2	10	4	0	13	10	2	12	6	4

## INFLUENZA DEATH RATES

91 cities.....	13	2 70	3 13	2 61	4 18	59	20	60	34	50
New England.....	5	34	10	46	5 17	46	7	43	14	24
Middle Atlantic.....	9	102	6 8	68	13	49	13	42	39	40
East North Central.....	11	36	12	52	15	56	18	61	37	61
West North Central.....	3	29	12	35	26	56	49	68	29	74
South Atlantic.....	14	2 127	16	2 129	18	119	18	123	31	79
East South Central.....	50	76	4 1	64	44	64	25	140	44	76
West South Central.....	37	100	30	73	44	159	50	97	24	45
Mountain.....	52	52	52	52	60	17	78	61	69	17
Pacific.....	9	14	12	12	7	14	14	26	14	41

## PNEUMONIA DEATH RATES

91 cities.....	109	2 259	3 119	2 231	4 134	218	154	2 218	157	212
New England.....	113	185	144	286	5 118	291	120	267	192	236
Middle Atlantic.....	111	369	6 103	293	124	254	162	236	184	217
East North Central.....	96	176	96	175	108	182	123	187	110	192
West North Central.....	113	159	160	136	244	124	285	147	244	218
South Atlantic.....	114	2 345	165	2 325	174	348	163	340	173	313
East South Central.....	125	229	7 157	178	182	166	144	267	138	274
West South Central.....	125	204	172	214	121	176	165	228	108	221
Mountain.....	138	200	215	209	172	183	198	200	224	191
Pacific.....	116	115	100	72	154	72	91	70	104	91

<sup>1</sup> The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1932, and 1931, respectively.

<sup>2</sup> Columbia, S. C., not included.

<sup>3</sup> Trenton, N. J., and Covington, Ky., not included.

<sup>4</sup> Barre, Vt., and San Francisco, Calif., not included.

<sup>5</sup> Barre, Vt., not included.

<sup>6</sup> Trenton, N. J., not included.

<sup>7</sup> Covington, Ky., not included.

<sup>8</sup> San Francisco, Calif., not included.

<sup>9</sup> The rates published in Public Health Reports dated Mar. 11, 1932, (pp. 631, 632) for the week ended Feb. 21, 1931, are incorrect as for that week. They are the rates for the week ended Feb. 28, 1931.

# FOREIGN AND INSULAR

## CANADA

*Provinces—Communicable diseases—Week ended February 20, 1932.*—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the week ended February 20, 1932, as follows:

Province	Dysentery	Influenza	Lethargic encephalitis	Polio-myelitis	Small-pox	Typhoid fever
Prince Edward Island <sup>1</sup> .....						
Nova Scotia.....		19				
New Brunswick <sup>1</sup> .....						
Quebec.....				2		8
Ontario.....		96	1		16	5
Manitoba.....						1
Saskatchewan.....			1		23	7
Alberta.....						1
British Columbia.....	1				10	3
Total.....	1	115	2	2	49	25

<sup>1</sup> No case of any disease included in the table was reported during the week.

*Ontario—Communicable diseases—Comparative—Five weeks ended January 30, 1932.*—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the five weeks ended January 30, 1932, and the corresponding period of 1931, as follows:

	Five weeks, 1932		Five weeks, 1931	
	Cases	Deaths	Cases	Deaths
Actinomycosis.....			1	
Cerebrospinal meningitis.....	9	5	6	3
Chicken pox.....	1, 104		1, 827	
Diphtheria.....	315	11	357	14
Dysentery.....			1	1
Erysipelas.....	25	2		
German measles.....	56		74	
Gonorrhea.....	286		174	
Influenza.....	11	10	32	9
Jaundice.....	10			
Lethargic encephalitis.....	2	1	1	1
Measles.....	4, 926		159	
Mumps.....	703		790	1
Paratyphoid fever.....			1	
Pneumonia.....		156		202
Polio-myelitis.....	2		2	
Puerperal septicemia.....	1			
Scarlet fever.....	526	4	1, 029	7
Septic sore throat.....	11	4	3	1
Smallpox.....	14		47	
Syphilis.....	234	1	187	1
Trench mouth.....	2			
Tuberculosis.....	185	66	121	55
Typhoid fever.....	23	2	34	4
Undulant fever.....	6		15	
Whooping cough.....	844	2	266	8

*Quebec Province—Communicable diseases—Week ended February 20, 1932.*—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended February 20, 1932, as follows:

Disease	Cases	Disease	Cases
Chicken pox.....	91	Puerperal fever.....	2
Diphtheria.....	26	Scarlet fever.....	91
Erysipelas.....	12	Tuberculosis.....	73
German measles.....	8	Typhoid fever.....	8
Measles.....	370	Whooping cough.....	45
Poliomyelitis.....	2		

## CUBA

*Habana—Communicable diseases—Four weeks ended February 27, 1932.*—During the four weeks ended February 27, 1932, certain communicable diseases were reported in the city of Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chicken pox.....	5	—	Scarlet fever.....	6	—
Diphtheria.....	9	2	Tuberculosis.....	44	8
Malaria <sup>1</sup> .....	10	3	Typhoid fever <sup>1</sup> .....	11	2
Measles.....	11	—			

<sup>1</sup> Many of these cases are from the island of Cuba, outside of Habana.

## GREAT BRITAIN

*Scotland—Vital statistics—Year 1931.*—The following vital statistics for the year 1931, with deaths from certain causes are taken from a report published by the Registrar General of Scotland:

Number of births.....	92, 209	Deaths from—Continued.	
Birth rate per 1,000 population.....	19. 0	Heart disease.....	9, 534
Marriages.....	32, 667	Influenza.....	1, 270
Number of deaths.....	64, 230	Measles.....	641
Death rate per 1,000 population.....	13. 3	Nephritis.....	1, 797
Deaths under 1 year.....	7, 545	Pneumonia.....	4, 955
Deaths under 1 year per 1,000 births.....	82	Puerperal sepsis.....	207
Deaths from—		Scarlet fever.....	161
Bronchitis.....	3, 673	Tuberculosis, pulmonary.....	3, 002
Cancer.....	7, 159	Tuberculosis, other forms.....	1, 201
Cerebrospinal fever.....	290	Typhoid fever.....	31
Diabetes mellitus.....	660	Whooping cough.....	957
Diphtheria.....	356		

*Scotland—Vital statistics—Quarter ended December 31, 1931.*—The Registrar General of Scotland has published the following statistics for the fourth quarter of the year 1931:

Population (provisional).....	4,842,554
Births.....	21,870
Birth rate per 1,000 population.....	17.9
Deaths.....	14,880
Death rate per 1,000 population.....	12.2
Marriages.....	8,090
Deaths under 1 year.....	1,672
Deaths under 1 year per 1,000 births.....	76
Deaths from—	
Bronchitis.....	688
Broncho-pneumonia.....	481
Cerebrospinal fever.....	61
Diabetes.....	172
Diphtheria.....	87
Dysentery.....	5
Erysipelas.....	49

## Deaths from—Continued.

Heart disease.....	2,204
Influenza.....	140
Measles.....	404
Nephritis (acute).....	42
Nephritis (chronic).....	300
Pneumonia.....	214
Pneumonia (lobar).....	272
Puerperal sepsis.....	53
Scarlet fever.....	53
Syphilis.....	35
Tetanus.....	3
Tuberculosis.....	898
Typhoid and paratyphoid fever.....	8
Whooping cough.....	90

## ITALY

*Communicable diseases—Four weeks ended September 20, 1931.*

During the four weeks ended September 20, 1931, certain communicable diseases were reported in Italy as follows:

Disease	Aug. 24-30		Aug. 31-Sept. 6		Sept. 7-13		Sept. 14-20	
	Cases	Com-munes affected	Cases	Com-munes affected	Cases	Com-munes affected	Cases	Com-munes affected
Anthrax.....	77	63	38	30	61	44	46	41
Cerebrospinal meningitis.....	3	3	5	5	7	6	6	5
Chicken pox.....	40	27	33	29	37	26	51	35
Diphtheria.....	391	212	350	219	523	248	425	236
Dysentery.....	72	30	46	25	47	26	23	18
Lethargic encephalitis.....	3	3	-----	-----	1	1	2	2
Measles.....	372	137	285	96	424	129	311	90
Poliomyelitis.....	20	15	7	7	23	14	25	18
Scarlet fever.....	255	101	236	117	353	131	300	133
Smallpox.....	-----	-----	-----	-----	-----	-----	1	1
Typhoid fever.....	1,149	566	1,185	554	1,585	687	1,267	577

## PANAMA CANAL ZONE

*Communicable diseases—January, 1932.*—During the month of January, 1932, certain communicable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chicken pox.....	23	-----	Mumps.....	1	-----
Diphtheria.....	3	-----	Pneumonia.....	-----	81
Leprosy.....	2	-----	Poliomyelitis.....	3	-----
Malaria.....	98	3	Tuberculosis.....	-----	29
Measles.....	40	1	Whooping cough.....	11	1







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

## CHOLERA—Continued

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

Place	Aug., 1931	Sept., 1931	Octo- ber, 1931	November, 1931			December, 1931			January, 1932			February, 1932	
				1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20
Indo-China (French) (see also table above):														
Annam *	C												4	4
Cambodia *	D	12	14	19	3	1							4	4
Cochin-China *	D	2	7	18					2		1	9	2	2
	D	39	18	14	5	1	8	3	1	1	2	2	3	2
	D	32	13	13	4		5	2		1	1	1	7	P

## PLAGUE

Place	Aug. 23- 29, 1931	Sept. 30- Oct. 6, 1931	Oct. 17- Nov. 23, 1931	Week ended—													
				November, 1931			December, 1931			January, 1932			February, 1932			Mar. 5, 1932	
				21	28	5	12	19	26	2	9	16	23	30	6	13	20
Argentina: Cordoba Province <sup>1</sup>									1								
Azores:																	
San Miguel Island				2	3												
Terceira Island				9	7												
Cape Verde Islands				4	2												
Belgian Congo																	
British East Africa (see also table below):																	
Tanganyika	4	13															
Uganda	289	276	218	41	38	31	35	28	13	9	13	10					
Canary Islands: Palma Island—Los Llanos	207	270	211	39	38	30	34	24	15	10	13	8	5	3			





Place	Aug- ust, 1931	Sep- tem- ber, 1931	Octo- ber, 1931	No- vem- ber, 1931	De- cem- ber, 1931	Jan- uary, 1932	Feb- ru- ary, 1932	Place	Aug- ust, 1931	Sep- tem- ber, 1931	Octo- ber, 1931	No- vem- ber, 1931	De- cem- ber, 1931	Jan- uary, 1932	Feb- ru- ary, 1932
Slam.....	C	4	4	5	1	1	1	1							
Spain: Hospitalet—Barcelona Province.....	D	3	3	2				1							
Syria: Beirut.....	C	2	2	7											
Tunisia: Tunis.....	D	1	1	1											
Union of South Africa: Orange Free State.....	C	2	3	1					P						
	C	P	P												
British East Africa (see also table above): Kenya.....	C	235	64	41	17			Peru—Continued.							
Ecuador:								Departments—Continued.							
Province—								Lambayeque.....		1					
Chimborazo.....	C	13	2		8	13		Libertad.....	C	1					
Loja.....	C	4	11		11			Lima.....	C	1		2		1	
Indo-China.....	C	4	3	9	16	1		Plague-infected rats	C	1	1	9		6	
Madagascar (see also table above):	D	4	1	5	9	1		Lima.....	C			1			
Amboitra Province.....	C	2	8	49				Piura.....	C			1		1	
Antistrabe Province.....	D	1	1	42					C		8				
Maevatanana Province.....	D	22	19	27	19			Senegal:			7				
Miarinarivo Province.....	D	23	17	17				Baol.....	C	101	6	2			
Moramanga Province.....	D		18	4				Dakar.....	C	58	8				
Tananarive Province.....	D	20	16	9	5			Diourbel.....	C	194	2				
Peru.....	C	3	12	15				Louga.....	C	106	4				
Departments—	D	3	11	14				Rufisque.....	C	13	1	10			
Canele.....	D	45	120	134				Thies.....	C	2	1	19			
Cajamarca.....	D	44	63	132				Yombel.....	C	2	2	0			
	D	19	8	21	9						7	12			
	D	14	7								1	16			
	C			14	3						8	7			
	D			5											P

1 Reports incomplete.

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

## SMALLPOX

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

Place	Aug. 22- Sept. 19, 1931	Sept. 20-Oct. 17, 1931	Oct. 18- Nov. 14, 1931	Week ended—											
				November, 1931				December, 1931				January, 1932			
				21	23	5	12	19	26	2	9	16	23	30	February, 1932
Aden.....															27
Algeria.....	C														
Algiers.....	C			1				1							
Constantine.....	C	1												2	
Southern Territories.....	C														
Brazil:															
Porto Alegre (alastrim).....	C	48	46	57	9	8	15	19	14	8	13	7	4		
Santos.....	C			3			1	1	1		1	2			
Rio de Janeiro.....	C														
British East Africa: Tanganyika.....	C	50	1,184	18	2				1		55	4			
British South Africa:		5	97	2							4				
Northern Rhodesia.....	D										7				
Southern Rhodesia.....	C	3	1								1				
Canada:															
Alberta.....	C		12	6		2	1		9	2	2	1	4	8	10
British Columbia.....	C	2		2		1							5	5	
Manitoba.....	C	1													
Winnipeg.....	C	1													
Nova Scotia.....	C					1									
Ontario.....	C	6	17	15	3	2	5	1	10	2	2	3	2	1	4
Kingston.....	C	1													16
North Bay.....	C														
Ottawa.....	C	1	8	12								1			
Toronto.....	C					1									
Quebec.....	C									2	1		1		
Saskatchewan.....	C	33	11	33	12	5	9	8		1	10	21	7	7	23
Regina.....	C		2												
Chile:															
Santiago.....	C			3											
Tocopilla.....	C			2						2					



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

## SMALLPOX—Continued

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

Place	Aug. 22— Sept. 19, 1931	Sept. 20—Oct. 17, 1931	Oct. 18— Nov. 14, 1931	Week ended—															
				November, 1931			December, 1931			January, 1932						February, 1932			
				21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	
India—Continued.																			
Moulmein.....		2	1	1			1						1			3	2		
Nagapatam.....	4	1	3	3	2	2	2	2	3	4	4	18	13	15	35	58	39	141	
Rangoon.....	2	3	2	1	2	2	1	2	1	1		2	7	7	8	15	10	18	46
Tuticorin.....	2	4	4	5	4	4	4	2	2	2		2	2	2	19	9	9	5	
Vizagapatam.....	6	6	1	1								2	2		2			2	1
India (French):																			
Karikal.....	7	8	4	1		2	2	4	4			4				1			
Pondicherry Province.....	3	3	4	1		2	2	4	4			2				1			
Indo-China (see also table below):	26	23	38	9	6	5	6	6	10	7	7	1	4	4	11	4	13	8	4
Phnompenh.....	24	21	36	9	5	5	5	6	10	7		1	4	4	6	4	13	8	4
Saigon and Cholon.....																			
Iraq:																			
Baghdad.....	6	6	7	4	6	7	9	13	8	3	8	3	8	23	28	43	23	38	21
Basra.....	3	3	5	2	1	3	6	9	6	2	7	18	22	35	17	24	24	23	
Mosul Liwa.....	1			1	1	4	6	3	4	4	4	4	5	2	2	2	1	2	1
Ivory Coast (see table below).						1	2	2	1	2	2	3	9	2	2	2	2	2	1
Jamaica.....						1	2	2	1	2	2	1	1	1	1	1	1	1	
Japan:																			
Taiwan.....																			
Yokohama.....																			
				1									2						55







Bulgaria.....	C	1	2	2	2	2	1	1	1	1	1	13	3	1	1	---
Chile:	D	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Antofagasta.....		---	1	---	---	---	---	---	---	---	---	---	---	---	---	---
Santiago.....		---	34	3	---	---	---	---	---	---	---	1	---	---	---	---
China:	C	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Manchuria—Harbin.....		1	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Shanghai.....		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chosen (see table below).....	C	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Colombia: Cal.....	D	1	---	---	---	---	---	---	---	---	---	---	---	---	1	---
Czechoslovakia (see table below).....		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Egypt:		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Alexandria.....	C	2	---	---	---	---	---	3	---	---	---	---	---	---	1	---
Rafra.....	C	---	1	---	---	---	---	---	---	---	---	---	---	---	---	63
Cairo.....	C	1	---	---	---	---	---	1	---	---	---	---	---	---	---	---
Gharbi.....	C	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---
Provinces.....	C	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Greece (see table below).....	D	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Guatemala (see table below).....		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Holland: Free State.....	C	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ireland: Donegal County—Stranorlar.....		---	---	---	---	---	---	2	---	---	---	---	---	---	---	---
Lincoln County.....		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Crom.....	C	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---
Glin.....	C	2	1	---	---	---	---	---	---	---	---	---	---	---	---	---
Limerick.....	C	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---
Rathkeale.....	C	---	1	---	---	---	---	---	---	---	---	---	---	---	---	---
Waterford County—Lismore.....	C	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lithuania (see table below).....		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Mexico:		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Guadalajara.....	D	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Mexico City, including municipalities in Federal District.....	C	10	14	16	7	3	5	7	4	3	3	1	5	10	4	6
San Luis Potosi.....	D	4	8	4	1	1	1	1	2	1	1	2	1	4	2	2
Torreon.....	C	---	2	3	---	---	---	---	---	---	---	---	---	---	---	---
Morocco.....	C	---	2	6	---	---	---	---	---	---	---	---	---	---	---	---
Palestine.....	C	---	4	1	---	---	---	11	6	4	1	1	3	2	1	3
Paraguay: Asuncion.....	C	---	6	3	---	---	---	2	1	2	1	1	1	1	1	1
Poland.....	D	4	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Portugal: Oporto.....	C	11	14	20	16	36	32	22	68	30	46	49	69	61	74	61
Rumania.....	C	---	3	2	2	---	---	6	5	5	3	1	4	4	2	2
Tunisia: Tunis.....	C	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Tunisia: Tunis.....	C	13	18	38	13	13	13	29	25	41	42	62	83	1	---	---
Tunisia: Tunis.....	C	3	3	9	1	1	2	2	4	5	1	3	1	---	---	---
Tunisia: Tunis.....	D	---	---	3	---	---	2	---	---	---	---	---	---	---	1	1

<sup>1</sup> Typhus fever has been reported in Peru from May to November, 1931, 153 new cases being reported during the months of October and November. The disease has not spread to the coastal regions.





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

## YELLOW FEVER—Continued

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

Place	Week ended—									
	October, 1931		November, 1931				Sept. 20–Oct. 17, 1931		December, 1931	
	24	31	7	14	21	28	Aug. 28–Sept. 19, 1931	Sept. 20–Oct. 17, 1931	5	26
Ivory Coast:										
Bobo Dioulasso.....	1	1								
Grand Bassam.....							4	1		
Kong Circle.....	4						2	1		
Seguela.....		P								
Tebini.....			1							
Nigeria <sup>1</sup> .....		1		1		2				
Senegal:										
Podor (Hinterland).....							1			
St. Louis.....							1			
Thies.....							1			
Sudan (French).....										
Macina—Kayo Circle.....	4									
Togo (French): Atakpame—Anie Circle.....			1	2					1	
Upper Volta:										
Banfora.....	2							2		
Dedougou.....	1							1		
Diarabakoko.....								2		
Ouagadougou.....								1		

<sup>1</sup> Yellow fever was reported in Oshogbo, Nigeria, on Feb. 16, 1932.

X