PUBLIC HEALTH REPORTS

VOL. 43 FEBRUARY 17, 1928 NO. 7

HEALTH CONDITIONS IN THE UNITED STATES, OCTOBER, NOVEMBER, AND DECEMBER, 1927

PREVALENCE OF DIPHTHERIA, INFLUENZA, MENINGOCOCCUS MENINGITIS, POLIOMYELITIS, SCARLET FEVER, SMALLPOX, AND TYPHOID FEVER

The preliminary reports of the prevalence of communicable diseases and the incomplete mortality data available for the fourth quarter of the year 1927 indicate in general unusually good health conditions in the United States. The general death rate was low as compared with previous years. The weekly death rates in large cities, compiled by the Bureau of the Census and published in the Public Health Reports, averaged about 2 per cent lower during these months than they did during the same months in 1926, and the figures for the quarter in 1926 were low. The large industrial insurance companies also experienced low death rates during the last three months of 1927.

In the comparisons given below of the reports for the years 1925, 1926, and 1927, preliminary telegraphic reports, received weekly from State health officers, are used for all three years. Final figures for 1927 are not yet available.

DIPHTHERIA

The increased prevalence of diphtheria which was noted during the first three quarters of the year 1927 continued during the fourth quarter. The number of cases reported in 1927 was greater than the number in 1925 or 1926, but the 1927 diphtheria rates are low when compared with the rates of a few years ago.

Comparisons of the case and death rates for diphtheria for the years 1916 to 1926, inclusive, were published in the Public Health Reports of October 7, 1927, page 2444.

During the last 13 weeks of the years 1925, 1926, and 1927, 37 States, with a population of about 90,500,000 in 1927, reported cases of diphtheria as follows:

	Cases
1925	22, 081
1926	26, 564
1927	27, 414

INFLUENZA

During the last 13 weeks of the years 1925, 1926, and 1927, 28 States reported cases of influenza as follows:

	Cases
1925	6, 972
1926	7, 777
1927	6, 747

These States had an aggregate population of about 62,800,000 in 1927.

The death rates for influenza and pneumonia are frequently relied upon to show the prevalence of influenza, as many cases of this disease are not reported. Weekly reports from 101 cities show an average death rate from influenza and pneumonia combined for the last 13 weeks of 1927 about 9 per cent below the average for the same period of 1926. The 1927 figures were lower than the 1926 figures for each of the 13 weeks except two.

MENINGOCOCCUS MENINGITIS

During the fourth quarter of 1927 more cases of meningococcus meningitis were reported than were reported during the same period of 1925 or 1926. It is possible, however, that some of the increase may be due to better reporting during 1927. The figures for 37 States for the 13 weeks from October 2 to December 31, 1927, and the corresponding period of the years 1925 and 1926, are as follows:

	Cases
1925	275
1926	364
1927	574

POLIOMYELITIS (INFANTILE PARALYSIS)

The 1927 epidemic of poliomyelitis reached its peak in September, but the incidence of the disease continued higher than usual until the end of the year.

Thirty-eight States, with an aggregate population of about 93,000,000, reported cases of poliomyelitis during the last 13 weeks of the years 1925, 1926, and 1927 as follows:

	Cases
1925	1, 124
1926	542
1927	3, 277

During the four weeks ended December 31, 1927, Massachusetts reported 55 cases of poliomyelitis; Ohio, 20 cases; Texas, 18 cases; and Illinois, 15 cases.

These figures are small as compared with those reported a few months earlier, but they are large for the month of December, and show that the effects of the increased prevalence lingered in widely separated localities unusually late. On the Pacific Coast, where the seasonal prevalence of poliomyelitis is somewhat different from that elsewhere, California reported 64 cases of poliomyelitis during the last four weeks of December; Oregon, 43 cases; and Washington, 26 cases. In all of the States named above the incidence of the disease decreased during December.

SCARLET FEVER

During October, November, and December, 1927, the number of cases of scarlet fever reported to the Public Health Service was almost the same as the number reported for the same period of the year 1925, but the figures are somewhat smaller than they were for these months in 1926.

Thirty-seven States, having a population of about 90,500,000 in 1927, reported cases of scarlet fever for the last 13 weeks of the years 1925, 1926, and 1927, as follows:

	Cases
1925	33, 253
1926	38, 865
1927	33, 131

SMALLPOX

During the last 13 weeks of the year 1927, smallpox was more prevalent than it was during the corresponding period of 1925 or 1926. This condition is the result of neglect of vaccination, for it is possible to control smallpox by vaccination and revaccination.

The geographical distribution of the cases is very far from being uniform. As usual, the New England and Middle Atlantic States, with large and dense populations, had comparatively few cases of this disease.

The following table shows, by geographical groups of States, the numbers of cases of smallpox reported for the last 13 weeks of the years 1925, 1926, and 1927, by the State health officers of 38 States, with an aggregate population of about 93,000,000:

Smallpox cases reported for 13 weeks of 1925, 1926, and 1927 (October 2–December 31, 1927)

Geographic divisions	1925	1926	1927
New England	0	0	3
Middle Atlantic	5	162	94
East North Central	1, 054	1, 431	1, 427
West North Central	606	688	1, 729
South Atlantic	263	1, 065	507
East South Central	290	161	102
West South Central	302	533	727
Mountain	135	289	369
Pacific	1, 268	793	741
38 States	3, 923	5, 122	5, 699

TYPHOID FEVER

The preliminary figures for the year 1927 indicate that when the record is complete the typhoid fever case rate for that year will probably be the lowest ever recorded in the United States. The case rates and death rates for typhoid fever have been decreasing since comparable general statistics have been compiled.

The following table gives the annual typhoid fever case rates per 100,000 from 1917 to 1927, inclusive. These rates are based on the reports to the Public Health Service by State health officers, and the 1927 rate is based on preliminary reports.

Typhoid fever case rates per 100,000 population, 1917 to 1927, inclusive

Year	Number of States included	Cases per 100,000 population	Year	Number of States included	Cases per 100,000 population
1917	35	64	1923	47	32
1918	37	51	1924	45	33
1919	36	43	1925	46	42
1920	41	38	1926	46	36
1921	45	47	1927 (provisional rate)	36	26
1922	46	34			

During the last 13 weeks of 1925, 1926, and 1927, 36 States, having a population in 1927 of about 88,000,000, reported cases of typhoid fever as follows:

	Cases
1925	7, 912
1926	7, 574
1927	5, 600

POLIOMYELITIS IN THE UNITED STATES, 1927

During the year 1927 the incidence of poliomyelitis in the United States was higher than it was during any other year since 1916, when a widespread epidemic of the disease occurred.

The following table gives the poliomyelitis case rates per 100,000 population for the thirteen years from 1915 to 1927, inclusive. These rates are based on reports made to the Public Health Service by State health officers. The reports are not complete for any year, and the 1927 rates are based on preliminary figures, but the data appear to be sufficient to show general trends.

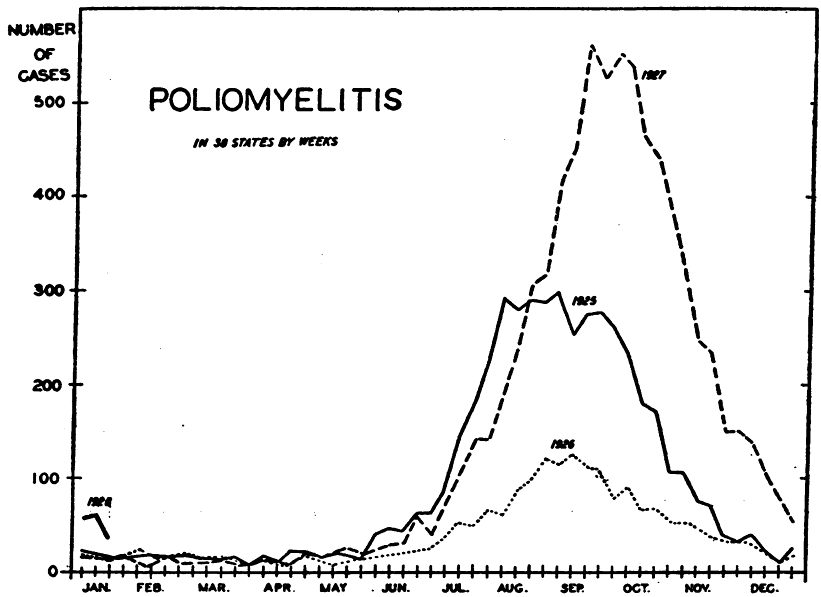
Poliomyelitis case rates per 100,000 from 1915 to 1927, inclusive

Year	Number of States included	Cases per 100,000 population	Year	Number of States included	Cases per 100,000 population
1915	22	3. 1	1922	39	2. 4
1916	27	41. 4	1923	40	3. 4
1917	30	5. 4	1924	38	5. 7
1918	34	2. 9	1925	44	5. 6
1919	32	2. 4	1926	40	2. 5
1920	36	2. 8	1927 (preliminary reports)	38	8. 4
1921	42	6. 9			

Weekly telegraphic reports from the State health officers of 38 States are available for the years 1925, 1926, and 1927. The aggregate population of these States was about 89,000,000 in 1925, 91,800,000 in 1926, and 93,000,000 in 1927. The accompanying chart shows graphically, by weeks, the numbers of cases of poliomyelitis reported by these 38 States for the three years and also for the first three weeks of 1928.

The aggregate numbers of cases of poliomyelitis reported for 52 weeks of each year are as follows:

1925	4, 903
1926	2, 074
1927	7, 784



Number of cases of poliomyelitis reported, by weeks, by 38 States for 1925, 1926, and 1927, and for the first three weeks of 1928

The chart shows that the aggregate number of cases reported was not sufficient to give warning of a general epidemic until late in July, 1927, although California, Louisiana, New Mexico, Arizona, and Texas reported more than the usual seasonal rise in the prevalence of poliomyelitis in June and July. This is in sharp contrast with the history of the epidemic of 1916, when New York State reported 345 cases of poliomyelitis in June and more than 4,000 cases in July.

In 1916 the peak of the epidemic was reached before the end of August, except in a few States, while in 1927 the peak was not reached until the middle of September, and the epidemic receded very slowly until after the first week of October.

The geographic distribution of the cases of poliomyelitis was irregular. This appears to be characteristic of the disease. In

1916 about half of the reported cases occurred in the State of New York, although the 26 other States which reported had almost six times the population of New York. In 1927 the States reporting the greatest number of cases were California, Massachusetts, and Ohio.

ELECTRON EQUILIBRIA IN BIOLOGICAL SYSTEMS

I. A METHOD FOR THE CONTINUOUS MEASUREMENT OF THE ELECTRICAL POTENTIAL IN LIVING CELLS

By Carl Voegtlin, *Professor of Pharmacology*, and Floyd De Eds, *Pharmacologist, Division of Pharmacology, Hygienic Laboratory, United States Public Health Service*

INTRODUCTION

All living organisms depend for their continued existence upon an external supply of energy. This energy is furnished in various forms: To plants as solar radiation; to animals almost entirely as so-called food, i. e., chemical energy. The utilization and transformation of this potential energy of food for the various needs of the animal has been and still is a fundamental biological problem. It is well known that this energy is made available by the gradual chemical disintegration of food to the end products of metabolism. Considerable information has accumulated concerning the nature of these complex biochemical reactions and the part they play in biological energy transformations. The interesting studies of Hill and Meyerhof on the energy transformations occurring during and following the contraction of skeletal muscle seem to indicate that the glycolytic process furnishes the energy for muscular contraction and that the energy required for recovery (restitution) is derived from the oxidation to CO_2 and H_2O of about one-fifth of the lactic acid formed during contraction.

In previous papers (1) (2) we have described some observations on spontaneously contracting isolated smooth muscle (guinea-pig uterus) which clearly showed that exposure of the muscle to substances such as glutathione, cysteine, cyanide, etc., produces sudden contractions. As proper precautions were taken to prevent changes in the hydrion concentration of the Locke solution, the contraction could not easily be attributed to changes in this factor. The suggestion was therefore made that the action of the above-mentioned substances is primarily due to their effect on an *oxidative* process of the muscle cells. It was furthermore pointed out that a proper correlation of oxidation-reduction potential and muscular contraction might materially assist in elucidating this problem. It was fully realized that the ideal procedure would consist in correlating muscular contraction with continuous measurements of the oxidation-reduction potential (time : potential curves) by means of a suitable electrode method. Unfortunately, the conventional method used in physicochemical work could not be applied to the problem under consideration, for reasons which will be given later on. However, through the kindness of Professor Clark, of the division of chemistry of this laboratory, we were supplied with a series of oxidation-reduction indicators whose potentials had been determined by Professor Clark and his colleagues. These indicators and anthraquinone sulphonate (Connant) were used in some unpublished experiments by one of us (V.) with Mr. McClosky for the purpose of shifting the oxidation-reduction potential of smooth muscle and observing the effect on the contraction. Briefly stated, it was shown that the exposure of the muscle to equimolecular concentrations of the different indicators produced effects which could be predicted by the previous work and a knowledge of the position of a given indicator on the electrometric scale. These observations made it imperative to develop a suitable electrode method; for it was obvious that only time : potential curves could furnish the necessary details for a proper appreciation of the potential changes occurring during muscular contraction and relaxation.

Before proceeding with the description of this method it may be advisable to discuss briefly some of the fundamental principles involved in this work.

All forms of energy have a dual nature, being composed of the intensity and capacity factors. In the case of chemical energy,

Chemical energy = chemical potential × equivalent weight.

The chemical potential (intensity factor) is sometimes called the driving force of a reaction. The equivalent weight (capacity factor) is the quantity of a chemical which takes part in the reaction. In the case of electrical energy we have the equation—

Electrical energy = electrical potential × quantity of electricity.

The electrical potential (intensity factor) is measured as electromotive force (volts). Now it has been shown that the electromotive force is proportional to the chemical potential, and the electromotive force can therefore be used as a measure of chemical potential.

The interrelation of chemical and electrical energy is explained by the electron theory, which postulates the transfer of negative electric charges (electrons) in any chemical reaction. This being so we have used the word electron equilibria in the title, so as to bring our results into harmony with modern theoretical chemistry and physics.

The term oxidation has assumed a much clearer meaning in the light of the electron theory. The oxidation of a given element or substance means simply the loss of one or more negative electric charges (electrons). For instance

$$Fe^{++} - e = Fe^{+++}$$

indicates the oxidation of ferrous ion to ferric ion, e being the symbol for electron.

Similarly, the oxidation of iron to ferrous ion can be written

$$Fe - 2e = Fe^{++}$$

The intervention of either oxygen or hydrogen in oxidations and reductions simply represents special cases of oxidation-reduction. It is possible to measure such oxidation-reduction reactions as

$$FeC_6N_6'''' \rightleftharpoons FeC_6N_6''' + e$$

by means of a suitable electrometric method.

DEVELOPMENT OF METHOD

Accurate potentiometric studies on biological systems are difficult for a number of reasons, but the most outstanding objections to current methods are the inability to follow continuously any potential changes originating within the system being studied, and the inability to follow such changes without drawing current from the system. The first objection means that a series of observations must be made, and the second objection demands that these observations must not be too close together. The second objection also prevents the accurate measurement of potential changes even though they be relative, because the withdrawal of current from the source results in polarization and a disturbance of the capacity factor.

It is one of the objects of this paper to describe an equipment which overcomes these difficulties. The apparatus permits the continuous observation of potential changes in a biological system without the withdrawal of current from the system. The possibility of such an equipment depends upon the modern three-electrode vacuum tube of the present day radio receiving set.

The use of the three-electrode vacuum valve in fields of endeavor other than the science of radio is not new. Höber (3), in 1919, had applied the three-electrode tube in his studies on the amplification of the action current of muscle. Daly and Shellshear (4), in 1920, employed the vacuum tube to amplify the movements of a string galvanometer in electro-cardiographic work. Forbes and Thacher (5) utilized the three-electrode tube to amplify the action currents of the frog sciatic. Gasser and Newcomer (6), in 1921, made use of the same principle in studies of the phrenic nerve. In 1922 Gasser and Erlanger (7) again applied the vaccuum tube in conjunction with a Braun tube for studies on nerve action currents. The chemists, as well as the physiologists, have had recourse to the advantages offered by the three-electrode vacuum tube. In 1921 Noyes (8) described its use in measurements of the potential in an electrolytic cell for the deposition of iron. Goode (9), in 1922, and again in 1925, discussed the use of the tube in the construction of a continuous reading electrometric titration equipment. Calhane and Cushing (10), in 1923, used a vacuum tube circuit for the accurate titration of dilute salt solutions with silver nitrate. For a somewhat similar purpose Treadwell (11) employed a vacuum tube in 1925.

In all the above-mentioned work the three-electrode vacuum tube proved useful for one or more of the following reasons: Its ability to detect minute fluctuations in potentials, its ability to amplify such changes, and its ability to act in a properly constructed circuit without drawing current from the source under investigation. Before giving a description of the equipment used in studies of electron equilibria in biological systems, a brief description of the manner of action of the three-electrode vacuum tube will be given. For a complete discussion the reader is referred to the text of H. J. Van Der Bijl (12).

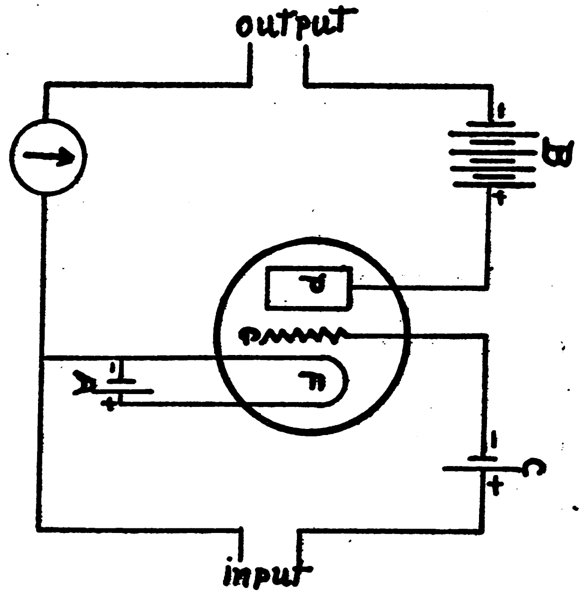


FIG. 1.—A=6-volt storage battery; B=plate circuit battery (voltage value dependent upon the tube and its use); C=grid circuit battery (voltage value dependent upon tube and its use); F=filament of tube; G=grid of tube; P=plate of tube; FGG=grid circuit; PB=plate circuit.

Input refers to connections leading to the source of potential being measured; output refers to connections leading to recording device.

When the filament F (Fig. 1) is heated by a current from battery A, there occurs an emission of electrons, some of which are drawn to the plate P by the positive charge imposed on plate P by the battery B. The current in the plate circuit is proportional to the number of electrons drawn to the plate and, hence, proportional to the positive charge imposed by B. A grid, G, is placed between the filament F and the plate P. Assuming a constant rate of electron emission from the filament F by virtue of a constant current from A, and assuming a constant positive charge on plate P, it follows that any variation in charge imposed on the grid G will result in an alteration in the number of electrons passing from the filament to the plate, i.e., an alteration in the plate circuit. For example, when the grid G is positively charged, the removal of electrons from the filament is facilitated, and the current in the plate circuit is increased; but when the grid is negatively charged, electrons are repelled back to the filament, a smaller number of electrons reach the plate, and the plate current is consequently decreased. In other words, under the conditions of constant filament temperature and constant B battery voltage the current flowing in the plate circuit is a function of the current in the grid circuit.

If it is desired to use the tube in such a way that no current will be drawn from the source the potential of which is being measured, certain other considerations are of importance. When the grid becomes positive, there is an attraction of electrons to the grid and a current is set up in the grid circuit, for the resistance of grid circuit is no longer infinite. If, however, the source of potential causing fluctuations in the grid potential is superimposed upon a constant negative potential furnished by battery C, and large enough to keep the grid negative under all circumstances, the resistance of the grid or input circuit will remain infinite and no current will flow. Under these conditions the current in the plate circuit is a function of a variable grid potential, which always remains negative to the filament. This is a circumstance of the greatest importance for the measurement of potentials in biological systems, *for it meets the requirement of measuring potential variations without the withdrawal of currents from the systems of small capacity under investigation.*

Utilizing the principles so far discussed, a two-tube circuit[1] has been devised for the continuous measurement of the voltage changes taking place in spontaneously and rhythmically contracting tissue. The entire arrangement of the equipment is shown diagrammatically in Figure 2. For purposes of detail the vacuum-tube circuit is shown on a much larger scale than are the portions of the diagram relating to the potentiometer and the apparatus for supporting and recording the contractions of the tissue.

The various electrical connections are obvious from the diagram in Figure 2, but a few remarks concerning the choice of parts may be of interest. A single-tube equipment was used in the early part of the investigation, but the two-tube apparatus proved to have a greater range of utility. An equipment may be designed to use almost any type of tube, but in the set here described, storage-battery tubes were used, because a storage battery, preferably the lead type, of large capacity, about 150 ampere hours, supplies a more constant current to the tube filaments than is possible with tubes operated by dry cells. The first stage is supplied with UX 240 tube, because of its high amplification, while the second stage is equipped with a UV 201A. The plate or output circuit of the UX 240 tube feeds

[1] We express our appreciation to Dr. L. H. Adams, of the Geophysical Laboratory of the Carnegie Institution of Washington, for helpful suggestions in planning the two-tube arrangement.

into the grid circuit of the UV 201A tube through a variable ½ meg ohm resistance connected in series with a 22.5-volt C battery, the variable resistance acting as one of the controls for adjustment to maximum sensitivity. The millivoltmeter in the plate circuit of

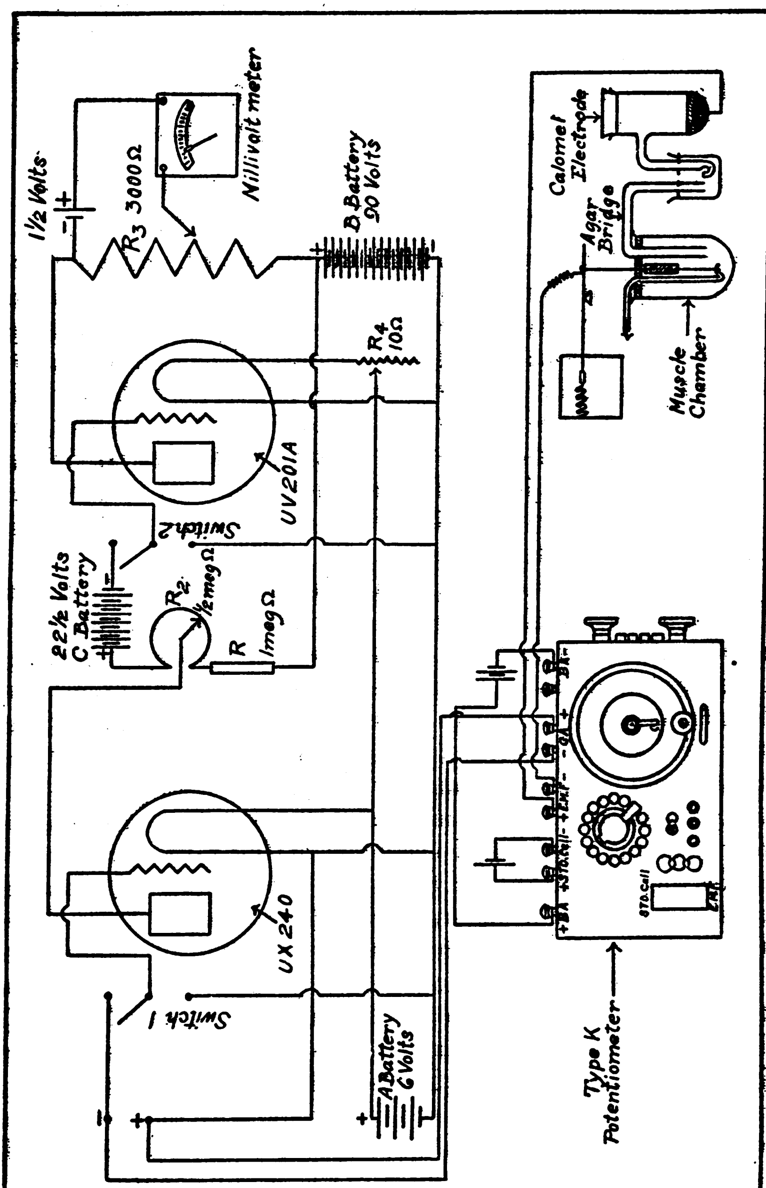


FIG. 2.—Diagram showing connections of two tube equipment

the UV 201A tube is shunted by a 3,000-ohm variable resistance which acts as the second control for adjustment of maximum sensitivity.

By proper manipulation of the variable shunt resistance, R_3, and the two single-pole double-throw switches 1 and 2, it is possible to adjust the apparatus without damage to the millivoltmeter. With switches 1 and 2 in the "down" position and all the resistance in R_3 cut out, the filament current is turned on. Switch 2 is now thrown to the "up" position and the desired zero point of the millivoltmeter adjusted by means of R_2 and R_3. Then switch 1 is thrown to the "up" position and the adjustment of R_2 and R_3 repeated, the sensitivity being greater the larger the amount of resistance used in the shunt R_3. The best results have been obtained with a filament voltage of 5.4, B battery voltage of 90, and C battery voltage of 22.5.

GENERAL CONSIDERATIONS CONCERNING THE APPLICATION OF THE METHOD TO BIOLOGICAL PROBLEMS

From the preceding discussion it is evident that functional changes in biological systems should be reflected by corresponding changes in potential. Furthermore, the selection of rhythmically contracting isolated smooth muscle for testing out the reliability of our new method has been exceptionally fortunate for the reason that the functional change is not complicated by the use of an external stimulus, as would be necessary, for instance, in work on isolated striated muscle. Moreover, the contraction of such smooth muscle as the guinea pig uterus is slow enough to permit a proper correlation of the contraction curve with the potential curve.

In order to determine the potential of the tissue it is of course essential to insert the electrode directly into the tissue. By the use of a careful technique the thin platinum wire electrode can be inserted with the least amount of injury. In fact the technique can be so refined that it should be perfectly feasible to use the method in conjunction with the microtechnique of Chambers for the study of the potential of single cells (ameba, nitella, etc.).

The arrangement for the study of the movements of the isolated virgin guinea pig uterus and segments of the rabbit intestine was essentially the same as that in the previous work (2). The platinum electrode consisted of a 32-gauge wire 5 cm. long. This wire was carefully coated with Bakelite with the exception of 1 mm. at one end (*a*) and 5 mm. on the other end (*b*). The Bakelite formed beads, and these made it possible to tie securely the uncoated end (*a*) of the electrode into the upper lumen of the organ by means of a strong silk ligature. End (*b*) of the platinum electrode was then connected by means of a very thin and very flexible gold wire to a small piece of modeling clay which was located 5 cm. from the fulcrum of a light heart lever. The end of the gold wire was firmly connected with the copper lead to the potentiometer. (Fig. 2.) Special care was taken to have a sufficient length of gold wire between point of attachment and copper lead so as not to interfere in the least with the movement of the lever. The lower end of the muscle preparation was securely closed by a silk ligature and tied to the lower end of the glass tube through which oxygen was driven through the salt solution in which the muscle was suspended. A layer of liquid petrolatum, 1 cm. in thickness, was placed on top of the salt solution in order to prevent contact of the uncoated gold wire with the saline. The position of the muscle preparation in the bath was such as to insure complete immersion of the muscle in the saline bath at all times. The muscle lever was properly balanced and only sufficient weight was put on the muscle to take up the slack in the metallic and silk leads to the points of attachment.

The same arrangement was used for the experiments with isolated ventricular strips of the turtle's heart. The composition of the frog Ringer solution was as follows: NaCl, 0.6%; KCl, 0.0075%; $CaCl_2$ (anhydrous), 0.1%; $NaHCO_3$, 0.1%.

In the experiments with the turtle's heart *in situ* the platinum electrode was carefully tied into the apex and connected with the heart lever in the usual manner. One end of the agar bridge dipped into a cavity adjoining the heart, which was filled with frog Ringer solution.

A writing point of flexible photographic film was used in order to reduce the friction on the smoked kymograph paper to a minimum.

The voltage changes were read off by one person, and simultaneously recorded on the muscle curve by a second person and entered in the notebook by a third one. With this scheme the error committed in the correlation of potential curve and muscle curve was very small indeed. But it is obvious that continuous automatic registration of the potential curve is very desirable, in fact, essential for work with rapidly contracting organs. Preliminary experiments have shown that this is quite feasible and we shall report on this phase of the development of the method in a subsequent paper.

DISCUSSION OF PRELIMINARY RESULTS

Figure 3 shows a small section of a tracing of the rhythmic contractions (pendulum movements) of a duodenal segment of the rabbit. The lower line indicates time in seconds, up stroke indicates contraction of the muscle, and the figures represent millivolts. It was impossible to follow with the present technique more than the rough outline of the potential changes, but the high voltage value always was reached toward the end of relaxation and the low voltage at about the height of contraction. Attention is called to the great regularity of the potential changes coinciding with these rhythmic contractions, the maximum and minimum value differing only by 9 millivolts.

Figure 5 illustrates similar results obtained with a slowly contracting uterus. The lower line indicates time in seconds, the middle line time signals of the potential readings, and the figures on the muscle curve again millivolts. The relation between muscle curve and potential curve is still better brought out by Figure 4. Both figures show clearly the relation between spontaneous rhythmic contractions and potential changes. There can be no doubt that the two phenomena are fundamentally related. It appears *that contraction sets in within a short time after the potential begins to fall and the voltage reaches its minimum value at the height of contraction. Then, as the muscle relaxes, the voltage is gradually built up again; and this process repeats itself with each contraction.*

Figure 6 represents one of the tracings obtained with the ventricular strip of the turtle's heart. Time is given in seconds. Here again

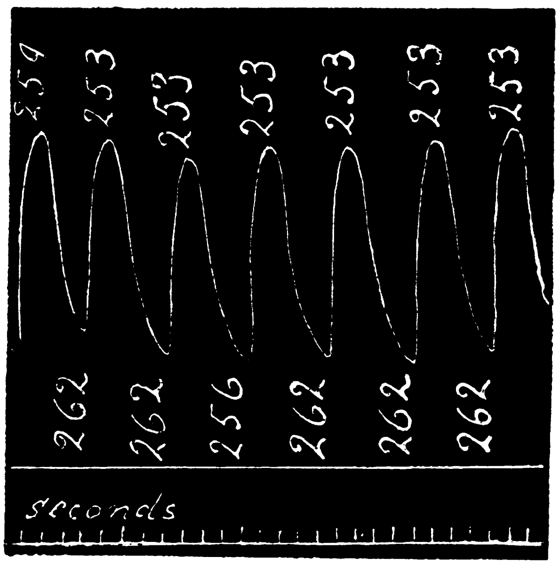


FIG. 3.—Rabbit duodenal segment

the same correlation is found between contraction and potential change.

Figure 7 illustrates a tracing of the turtle heart *in situ.* Time is in seconds. Up stroke represents contraction. During diastole the voltage is without exception 841 millivolts, and during systole 838—a difference of 3 millivolts. During the period indicated by the two arrows the vagus was stimulated by an induction current, with the result that the heart stopped contracting and the voltage increased by 6 millivolts (841 to 847). Twenty-four seconds after the vagus stimulation was stopped, the heart began to contract again and the same loss in voltage accompanying each contraction was again noted.[2]

[2] It appears that the method may furnish an explanation of the electrochemical cause of the electrocardiogram.

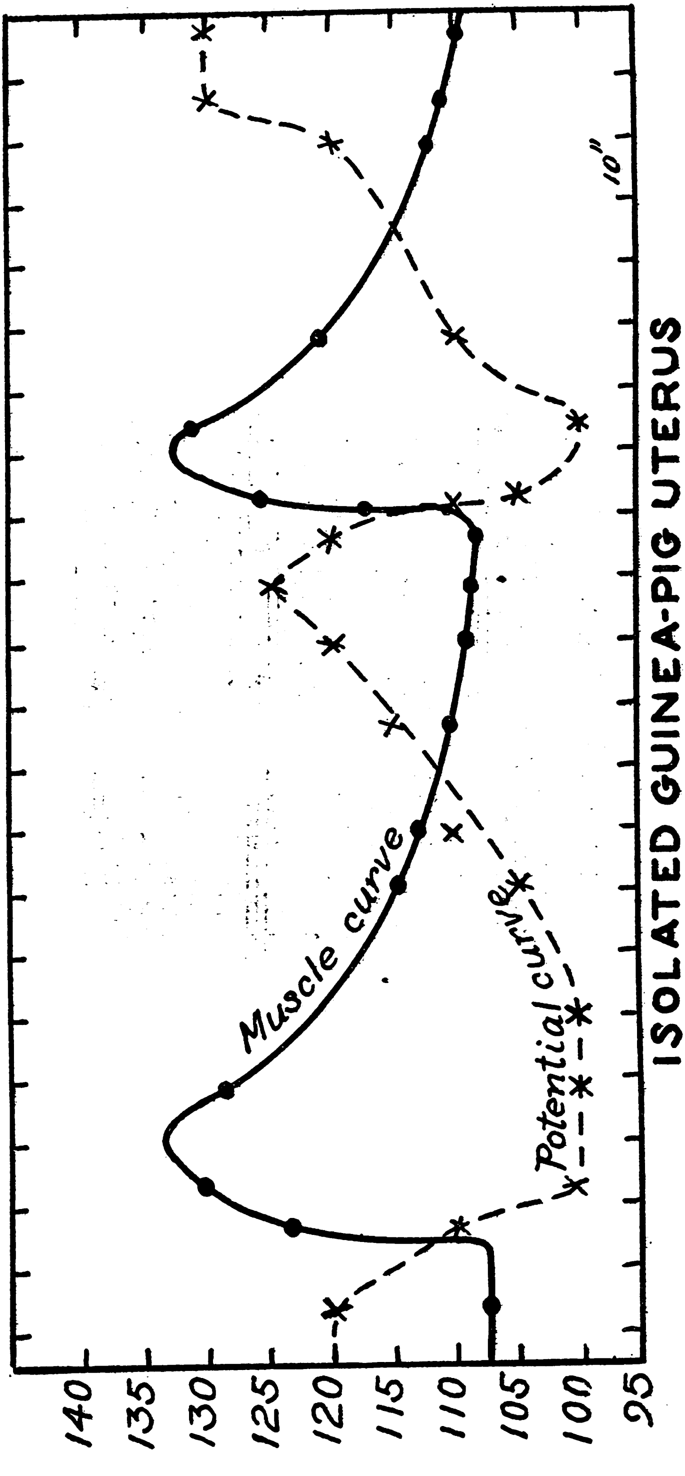


Fig. 4.—Relation between muscle curve and potential curve

Essentially the same situation was met in experiments in which the isolated gastrocnemius of the frog was stimulated through the sciatic nerve by a galvanic current. Here also contraction was accompanied by a loss of a few millivolts and relaxation by a return to the previous voltage.

Figure 8 illustrates an experiment designed to show the effect of changes in load on the potential. Time = 30 seconds. In this particular experiment a guinea pig uterus was put under a load of 3 grams, which is far in excess of the weight that the muscle could possibly lift. The voltage range fluctuated considerably without producing any contractions. At the time indicated by the arrow the muscle was released from the 3-gram weight, with the result that it immediately contracted and the voltage fell gradually from 660 with load to 365 millivolts after the load had been removed.

A similar experiment with the duodenal segment of the rabbit is illustrated by Figure 9. Time = 30 seconds. As far as the spontaneous contractions are concerned, the maximum voltage was always reached with relaxation, and the low voltage at the height of contraction, as in the experiment illustrated by Figure 3. The important new point, however, is the relation of the load to the voltage level. It is obvious that *the voltage level of the spontaneous contractions decreases with a decrease in load and increases with an increase in load.* This appears to be a fact of fundamental importance and is probably explained by the following line of reasoning. The work done by the muscle in lifting the weight during the spontaneous contractions is proportional to the weight if the contraction (distance) is of the same magnitude. In our experiment this is roughly true with the 1.5-gram, 1-gram, and 0.5-gram load. Now, there must be some relation between the chemical energy expended and the mechanical work performed by the muscle and an increase in work can be obtained only by an increased consumption of chemical energy. This latter, as we have seen, is—

$$\text{Chemical energy} = \text{chemical potential} \times \text{equivalent weight.}$$

Now the potential change occurs immediately after reducing the load or increasing it. An increased chemical potential immediately establishes conditions for increased mechanical work, for the potential is the driving force of chemical reactions. We are not in a position to give any information as to the changes occurring in the other work factor—the capacity. But very probably the chemical capacity (equivalent weight), being represented by the chemical constituents of the muscle, is not likely to be subject to such sudden alterations. We shall return to the discussion of this subject in a future communication; but we should like again to draw attention to Figure 8.

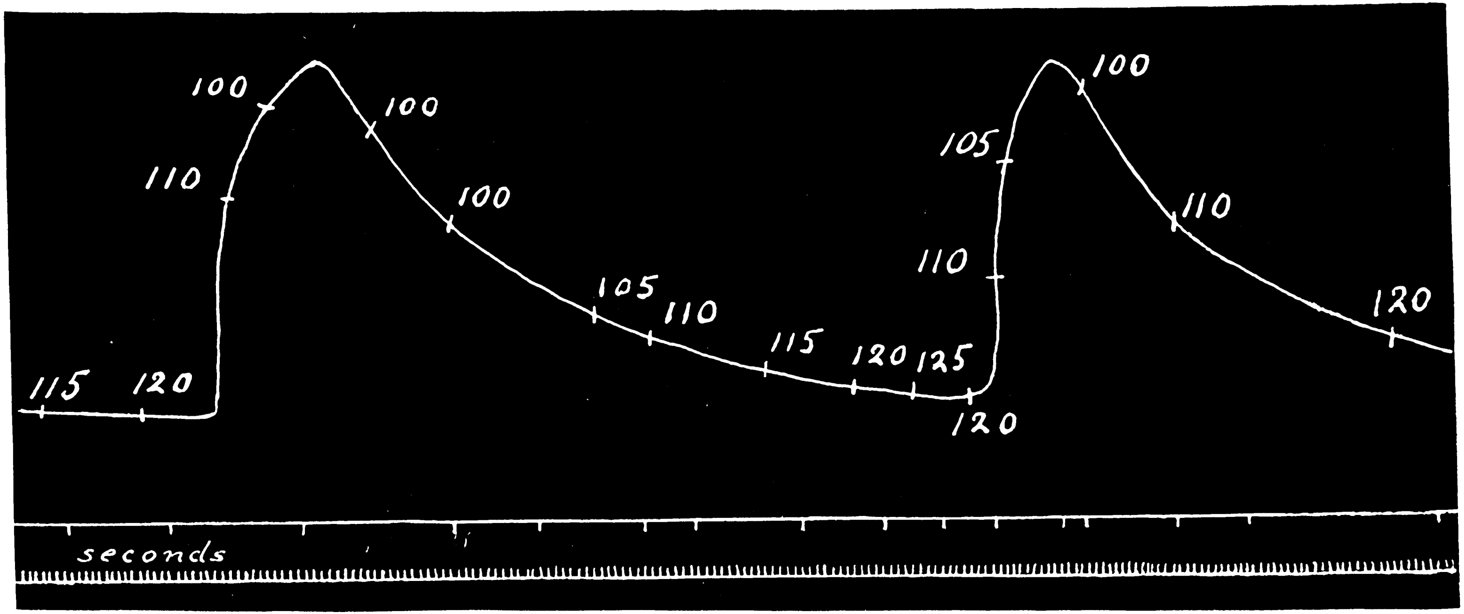
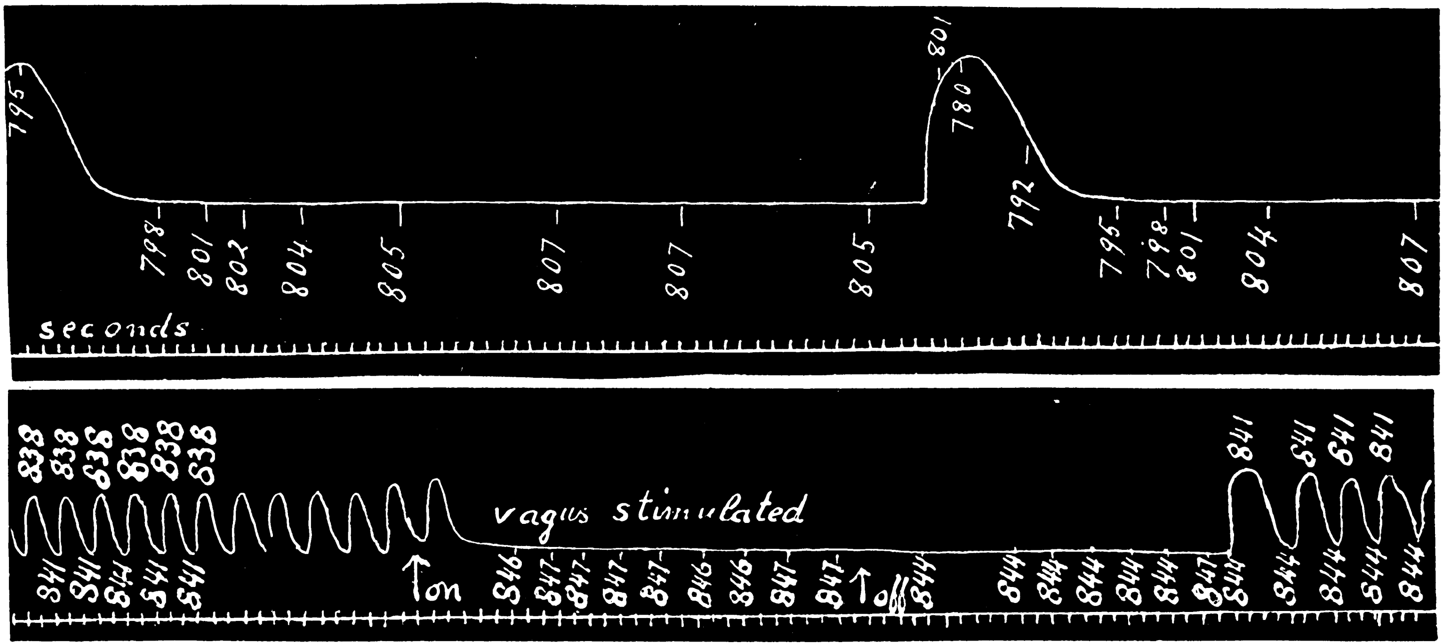


Fig. 5.--Guinea pig uterus. Spontaneous contractions and potential changes



Figs. 6 and 7.—Upper graph is tracing obtained with ventricular strip of turtle's heart; lower shows tracing of the turtle heart in situ

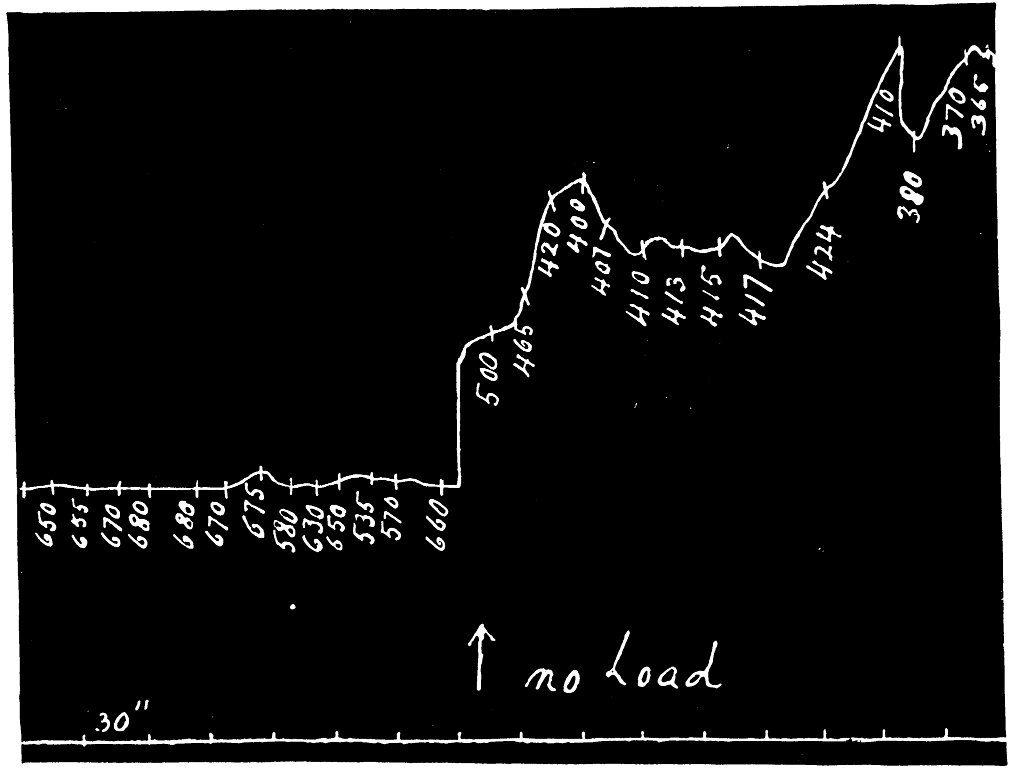


Fig. 8.—Guinea pig uterus. Effect of taking off 3-g. load

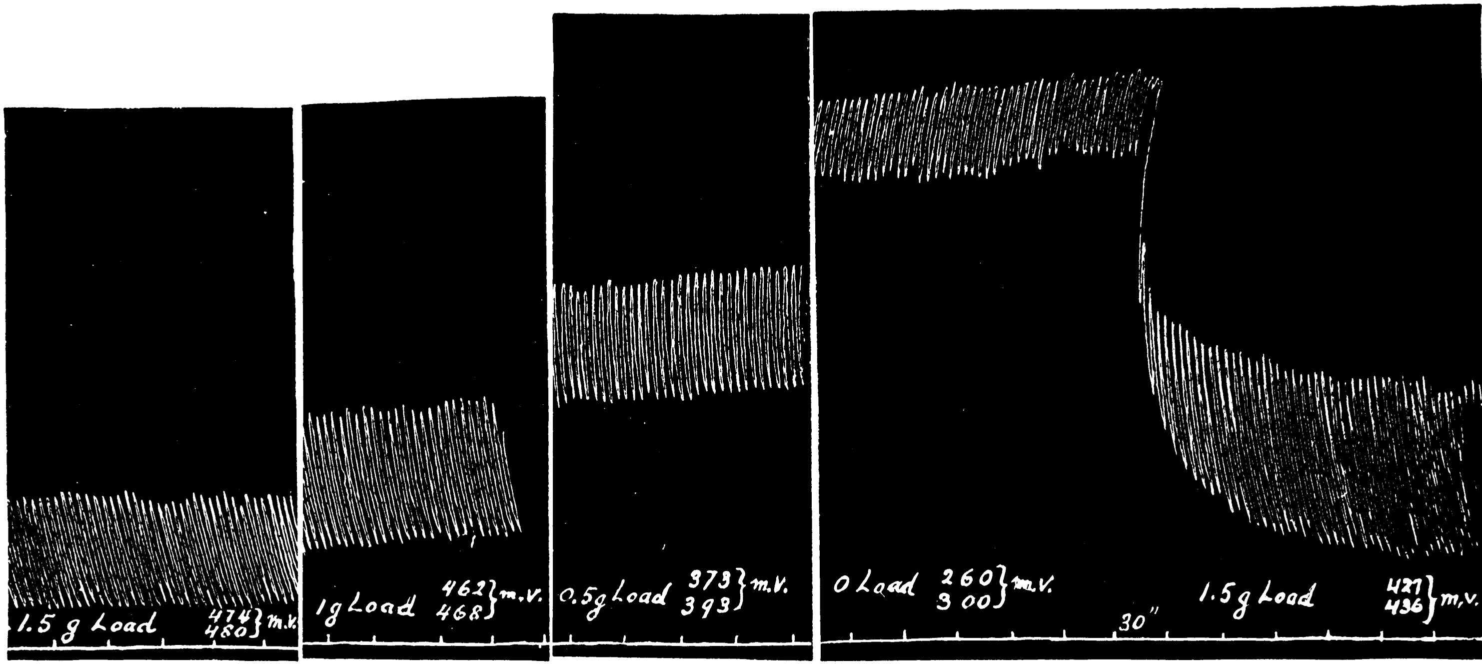


Fig. 9.—Tracing of rabbit duodenal segment. Effect of variation of loading

The uterus under an excessive load shows potentials which are very high indeed, although the muscle is not showing any appreciable spontaneous contractions. What is the explanation of this large increase in voltage resulting from heavy loading? The muscle does no external work, but nevertheless it must expend a large amount of energy in maintaining the weight at a given height. It appears that this demand for additional energy is met by the large increase in potential, or, to put it in other words, the "driving force" of the chemical reactions of the muscle tissue is increased.

The results which have been reviewed indicate that our new method reveals with great constancy a relation between potential change and functional change of a great variety of different living structures. We emphasize again that the arrangement does not involve withdrawal of current from the tissue, and, what is equally important, the observations made on the spontaneously contracting muscles are not complicated by the application of an external stimulus. For these reasons we believe that, due to fortuitous circumstances, we have selected the ideal conditions for testing out the reliability of the method for the study of biological problems. The relatively few experiments described throw a new light on muscular contraction, tonus, and physiological rhythm, and electrochemical studies of this sort will assist in the solution of many biologic puzzles.

We have refrained from interpreting the observed potential changes as changes in oxidation-reduction potential. Our equipment, consisting essentially of the set-up, voltmeter—platinum electrode—unknown potential—saline—agar bridge—calomel electrode—voltmeter, can be used to great advantage by the physical chemist for the determination of oxidation-reduction potentials of nonliving systems. Applied to biological systems, however, the method may or may not indicate oxidation-reduction potential pure and simple. The reasons for the justification of this standpoint will be discussed in the next paper. We feel justified, however, in using the method for the study of electrical potential irrespective of any given type of chemical potential which may be involved. In fact, we have been bold enough to use the title "electron equilibria," *because acid-base equilibrium, oxidation-reduction equilibrium, etc., all involve electron equilibria and are therefore interrelated.*[3] It seems, therefore, far better to begin work of this nature from the broadest aspect possible and to proceed then to a more detailed analysis.

It is obvious that the method has opened up a vast field of research in the fundamental medical sciences and in biology in general.

---

[3] We call attention to the fact that considerable confusion exists in this matter even in the recent literature on physical chemistry. This is due to a lack of proper perspective and the use of improper definitions.

81883°—28——2

SUMMARY

1. The need for a method for continuously following the electrical potential differences in biological systems is discussed.

2. The three-electrode vacuum tube is briefly described and shown to fulfill the requirements of making possible the measurement of potential changes without the withdrawal of current from the biological system.

3. A two-tube equipment is briefly described and all electrical connections are shown diagrammatically.

4. The basic principles for the applications of the method in biological studies are discussed.

5. Preliminary experiments with spontaneously and rhythmically contracting isolated smooth muscle, heart muscle, and electrically stimulated skeletal muscle indicate that contraction is accompanied by a decrease, and relaxation by an increase, in electrical potential. Rhythmic contractions are correlated with rhythmic potential changes and furnish a new interpretation of physiological rhythm and muscular contraction.

6. The method is suitable for the general study of the relation between function and electrochemical changes in living cells.

REFERENCES

(1) Voegtlin, C., and Dyer, H. E.: Jour. Pharmacol. and Exp. Ther., 1926, XXIX, 105.
(2) Johnson, J. M., McClosky, W. T., and Voegtlin, C.: Am. Jour. Physiol., 1927, LXXXIII, 15.
(3) Höber: Pflüger's Arch., 1919, CLXXVII, 305.
(4) Daly, I. de Burgh, and Shellshear, K. E.: Jour. Physiol., 1920, LIV, 287.
(5) Forbes, A., and Thacher, C.: Am. Jour. Physiol., 1920, LII, 409.
(6) Gasser, H. S., and Newcomer, H. S.: Am. Jour. Physiol., 1921, LVII, 1.
(7) Gasser, H. S., and Erlanger, J.: Am. Jour. Physiol., 1922, LXII, 496.
(8) Noyes, W. A.: Trans. Am. Electrochem. Soc., 1921, XXXIX, 451.
(9) Goode, K. H.: J. Am. Chem. Soc., 1922, XLIV, 26; ibid., 1925, XLVII, 2483.
(10) Calhane, D. F., and Cushing, R. E.: J. Ind. Eng. Chem., 1923, XV, 1118.
(11) Treadwell, W. D.: Helvetica Chim. Acta, 1925, VIII, 89.
(12) Van der Bijl, H. J.: The Thermionic Vacuum Tube and Its Application. McGraw-Hill Book Co., New York, 1921.

INFANT MORTALITY FROM DIFFERENT CAUSES AND AT DIFFERENT AGES IN NINE CITIES OF THE UNITED STATES [a]

By Selwyn D. Collins, *Associate Statistician, United States Public Health Service*

Infant mortality and its causes continue to occupy an important place in public health discussions. In the birth registration area of

[a] Some of the data included in this paper were originally prepared for and presented by a Public Health Service representative to the Office International d'Hygiène publique.

the United States infant mortality (deaths of infants under one year of age per 1,000 live births) has decreased from 100 in 1915 (the year the birth registration area was organized) to 71 in 1924. This is the remarkable decrease of 29 per cent. The death rate under 1 year of age per 1,000 persons decreased about 32 per cent from 1901 to 1920 in the United States.[1]

Infant mortality in the State of Massachusetts decreased from 170 in 1875 to 68 in 1924, a decline of 60 per cent in the half century.

Similar decreases could be cited for England, New Zealand, and almost any other important country of the world.

In recent years, however, there is a tendency toward a slackening of the decline. The rate for the birth registration area of the United States for the years 1925 and 1926 actually showed slight increases over 1924, the 1926 rate being slightly higher than the 1925. Such a tendency is inevitable as the rate approaches a more or less irreducible minimum—at least irreducible without new methods of attack upon the problem of infant mortality. Inasmuch as there is a tendency toward a slackening of the rate of decline, it behooves public-health workers to analyze the infant mortality more carefully. Two refinements suggest themselves in this matter: We may look more carefully into (*a*) the ages at which infants die and (*b*) the causes of death.

In considering the age group under 1 year as a whole, it may seem that the data have been sufficiently refined with respect to age. However, during the course of the first year a baby about trebles his weight and increases considerably in height. The actual increases in weight and in height from birth to 1 year of age are as great as in the period of rapid growth just before puberty, and the relative or percentage increase in these measurements is far greater during the first year of life than at any other period. The first year is, then, a very long one as judged by the baby's development and changes in his life during the period. Looking at the matter from this viewpoint, infant mortality becomes a very crude measure of what happens to the infant—as crude, comparatively, as the death rate at all ages combined which we have called the "crude" rate in contrast to the "adjusted" rate which takes account of differences in the age distribution of the peoples whose death rates are to be compared.

When all causes of death are considered as a whole, we are considering deaths from diarrhea and enteritis, measles, tuberculosis, etc., which causes appear to be associated with the baby's postnatal existence, together with deaths from premature birth, congenital malformations, etc., which appear to be more closely related to the

---

[1] Britten, R. H.: Some Tendencies Indicated by the New Life Tables. Pub. Health Rep., vol. 39, No. 15, Apr. 11, 1924. (Reprint No. 912.)

prenatal period of the baby's life than to anything which takes place after its birth.

What, then, is happening to the death rate of infants under 1 week of age, 1 week to 1 month of age, and 1 month to 1 year; and what is happening to the death rate from premature births, congenital malformation, etc., as compared with the death rate from diarrhea and enteritis and infectious diseases?

TREND IN INFANT MORTALITY

In Figure 1 infant mortality rates for Massachusetts, New Zealand, and the United States registration area [2] have been plotted on a semi-logarithmic chart to indicate the trend. On such a chart an equal distance vertically represents an equal relative or percentage change in the rate, and the slope of the line, therefore, indicates the proportional change in the rate. The top continuous line in Figure 1 represents the total infant mortality under 1 year of age in Massachusetts from 1870 to 1926. The dotted line at the top shows the same rate for the whole United States birth registration area since its organization in 1915. The two rates are very nearly the same, and the Massachusetts data may be assumed to represent fairly well the trend in the United States. The New Zealand total infant mortality rate is much less than that in Massachusetts or in the United States birth registration area and has been less during the past 50 years; but the general trends of the New Zealand and the Massachusetts curves are roughly parallel, indicating that the percentage decrease in the infant mortality has been about the same in the two countries.

At the bottom of the graph is a line representing the mortality under 1 month of age in New Zealand. This rate is about the same today as it was 50 years ago. Similar data are not available in the earlier Massachusetts reports; but since 1916, when such data became available for the United States birth registration area, the decline has been much less than that in the total infant mortality rate. If deaths under 1 week are considered, the decline has been still less, and deaths under 1 day do not seem to have declined at all.

Another line for New Zealand in Figure 1 represents deaths due to causes associated with early infancy. These deaths nearly all occur under 1 month of age, but the two groups are not identical. The trend, however, is the same—there has been little or no change in the rate for these causes in the past 50 years.

The death rate for causes associated with early infancy is shown for Massachusetts from 1901 to 1926. Although there has been some

---

[2] Data are from the following sources:

Massachusetts—Annual State Reports on Vital Statistics.

United States registration area—Annual Reports on Birth Statistics for the United States.

New Zealand—A New Zealand Study in Infant Mortality. By E. P. Neale. Jour. Amer. Statistical Assn., Sept., 1925.

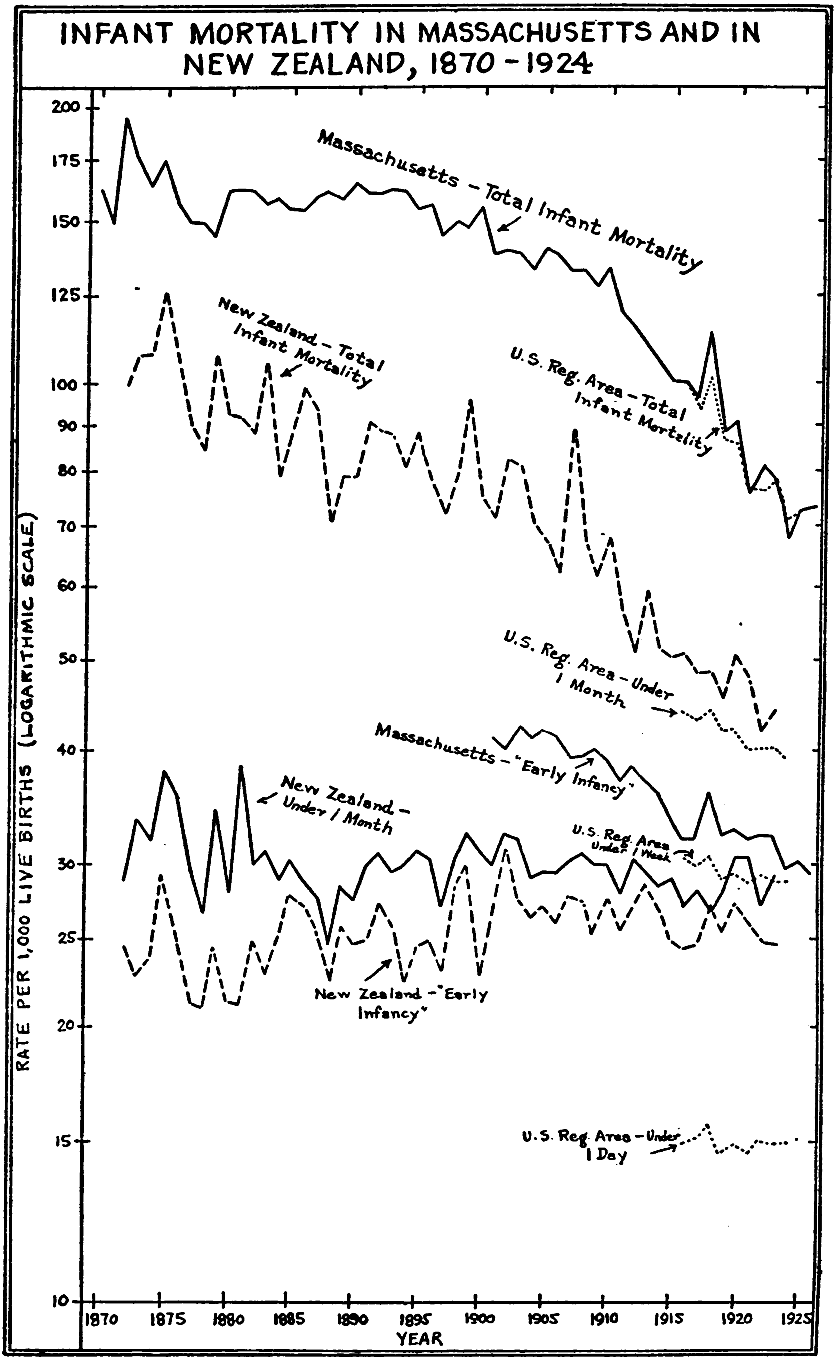

INFANT MORTALITY IN MASSACHUSETTS AND IN NEW ZEALAND, 1870 - 1924
Massachusetts - Total Infant Mortality
New Zealand - Total Infant Mortality
U.S. Reg. Area - Total Infant Mortality
U.S. Reg. Area - Under 1 Month
Massachusetts - "Early Infancy"
New Zealand - Under 1 Month
U.S. Reg. Area Under 1 Week
New Zealand - "Early Infancy"
U.S. Reg. Area - Under 1 Day
RATE PER 1,000 LIVE BIRTHS (LOGARITHMIC SCALE)
YEAR
200
175
150
125
100
90
80
70
60
50
40
30
25
20
15
10
1870
1875
1880
1885
1890
1895
1900
1905
1910
1915
1920
1925

FIG. 1

decrease in deaths from these causes, the decline is much less than in the total infant mortality.

Pirquet [3] has shown that in England and Wales the death rate during the first month of life had decreased very little; all the decrease in infant mortality has been in the ages over 1 month of age. Dublin [4] has pointed out that while infant mortality after the first month of life has decreased a great deal in the past 20 years the mortality of the first month of life has remained nearly the same throughout that period.

Woodbury [5] has shown that in the birth registration area of the United States infant mortality from malformations increased 10 per cent and from injury at birth increased 23 per cent from 1915 to 1921, although during the same period infant mortality from all causes decreased 21 per cent, diarrhea and enteritis decreased 34 per cent, respiratory diseases decreased 32 per cent, and in general other diseases important in the later months of the first year of life decreased considerably.

It appears, then, that infant mortality, as a whole, has been decreasing, but the mortality of early infancy has long been at a standstill, apparently unaffected by measures that have been taken to reduce infant mortality.

INFANT MORTALITY IN DIFFERENT CITIES

In different cities of the United States the infant mortality rate varies considerably even when cities of approximately the same size are compared. The question arises as to which causes of death are chiefly responsible for the difference. Is the variation chiefly in the early deaths which are presumably tied up with prenantal conditions or is it in the later months of infancy when postnatal conditions presumably have more influence on mortality?

The nine cities for which the data are given are all within the class of 100,000 to 600,000 population and range from the lowest to the highest in this country in infant mortality rates. These nine cities were selected solely on the basis of the size of the total infant mortality rate.

The infant mortality rate for Pittsburgh applies to the white population only; in the other cities the rate is for the total population. Pittsburgh is the only one of these cities with any large number of negroes.

---

[3] Pirquet, C.: The Decrease of the Death Rate Except among the Newborn. Monthly Epidemiological Report of the Health Section of the League of Nations, Sept. 15, 1926, p. 584.

[4] On Preventing Deaths in Early Infancy. Statistical Bulletin, Metropolitan Life Insurance Co., Vol. III, No. 10 (Oct., 1922).

[5] Woodbury, R. M.: Decline in Infant Mortality in the United States Birth Registration Area, 1915–1921. Amer. Jour. of Public Health, May, 1923.

TABLE 1.—*Populations, infant mortality rates, and birth rates in nine selected cities of the United States*

City	Population, census of 1920	Number of births, 1922–1924	Infant mortality rate per 1,000 live births, 1922–1924	Number of married women 15–54 years of age, 1920	Number of births, 1920	Birth rate per 1,000 married women 15–54 years of age, 1920	Birth rate per 1,000 total population, 1920
Seattle, Wash	315,312	16,032	48.5	62,978	6,166	97.9	19.6
Minneapolis, Minn	380,582	29,012	53.8	70,226	9,182	130.7	24.1
Portland, Oreg	258,288	15,435	54.2	51,667	5,202	100.7	20.1
San Francisco, Calif	506,676	26,366	56.6	90,958	9,034	99.3	17.8
Akron, Ohio	208,435	14,015	65.6	39,798	5,395	135.6	25.9
Rochester, N. Y	295,750	19,646	68.3	54,434	6,716	123.4	22.7
Pittsburgh, Pa	[1] 588,343	[2] 42,222	[2] 90.5	[2] 94,976	[2] 13,912	[2] 146.5	[2] 25.3
New Bedford, Mass	121,217	9,809	96.5	21,777	3,507	161.0	28.9
Fall River, Mass	120,485	10,772	103.8	19,403	3,537	182.3	29.4

[1] Includes 38,082 colored persons. Rates for Pittsburgh are for white only. For all the other cities the rate is for the total population, since none of the cities includes any large number of colored. Deaths for 1922 in these cities were not given by cause, age, and color.
[2] White only.

It is fully realized that these cities are not comparable. Pittsburgh is a "steel" town, with a population composed of many races; Fall River is a "textile" town; Minneapolis a flour-milling center of the agricultural Northwest. Again, these cities differ climatically. San Francisco is cooler in summer and probably warmer in winter than most of the other cities.

But no matter how different the conditions in these nine cities may be, it would seem legitimate to compare infant mortality at different ages and from different causes to see if the rates in these different subgroups run along with the total rates or whether the differences between the cities show up only in certain age periods and for certain causes of infant mortality. In Table 2 and Figure 2 a comparison of the rates in the nine cities is made for all ages and for the three age periods, under 1 week, 1 week to 1 month, and 1 month to 1 year.

TABLE 2.—*Infant mortality from all causes at different age periods of the first year of life in nine selected cities of the United States, 1922–1924*

City	All ages	Under 1 week	1 week to 1 month	1 month to 1 year
INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS				
Seattle, Wash	48.46	24.33	5.36	18.77
Minneapolis, Minn	53.81	26.95	8.03	18.82
Portland, Oreg	54.16	29.09	6.74	18.33
San Francisco, Calif	56.63	24.43	7.59	24.62
Akron, Ohio	65.57	26.83	8.78	29.97
Rochester, N. Y	68.26	30.34	9.06	28.86
Pittsburgh, Pa	90.50	30.77	11.82	47.91
New Bedford, Mass	96.54	30.48	11.72	54.34
Fall River, Mass	103.79	32.58	8.54	62.66

TABLE 2.—*Infant mortality from all causes at different age periods of the first year of life in nine selected cities of the United States, 1922-1924*—Continued

City	All ages	Under 1 week	1 week to 1 month	1 month to 1 year
RATIO OF THE RATE IN EACH CITY TO THE RATE FOR SEATTLE (SEATTLE RATE = 100)				
Seattle, Wash	100	100	100	100
Minneapolis, Minn	111	111	150	100
Portland, Oreg	112	120	126	98
San Francisco, Calif	117	100	142	131
Akron, Ohio	135	110	164	160
Rochester, N. Y	141	125	169	154
Pittsburgh, Pa	187	126	221	255
New Bedford, Mass	199	125	219	290
Fall River, Mass	214	134	159	334
NUMBER OF DEATHS				
Seattle, Wash	777	390	86	301
Minneapolis, Minn	1,561	782	233	546
Portland, Oreg	836	449	104	283
San Francisco, Calif	1,493	644	200	649
Akron, Ohio	919	376	123	420
Rochester, N. Y	1,341	596	178	567
Pittsburgh, Pa	3,821	1,299	499	2,023
New Bedford, Mass	947	299	115	533
Fall River, Mass	1,118	351	92	675

The rates in all cases are per 1,000 live births without any reduction to an annual basis. The annual death rate under 1 week would really be about fifty-two times the rates given here, or something like 1,500 per 1,000; in other words, if deaths continued at the rate they occur during the first week of life all the infants would die before they reached their first birthday. However, we are interested only in a comparison as between the cities, and as long as we compare rates for the same age period the different cities may be compared without reducing the rates to an annual basis.

In the top section of the graph the actual rates are shown; in the lower section they have been put on an index basis by dividing the rate for each city by the rate for Seattle, the city of this group having the lowest total infant mortality rate during the three years 1922-1924. In the age group under 1 week there is relatively little difference in the rates in the nine cities, the highest rate being only 34 per cent greater than the rate for Seattle. The age group 1 week to 1 month varies somewhat more; and when we turn to the age group from 1 month to 1 year of age there is a great deal more variation. In this latter age group the rate for Fall River is 234 per cent higher than the rate for Seattle, the rate for Pittsburgh is 155 per cent higher, and the rate for New Bedford is 190 per cent higher than the Seattle rate. Nearly all of the large differences in the infant mortality rates of these cities are in the rates over 1 month of age; the rates under 1 week are relatively constant. The geographical position, climatic conditions, racial stock, industrial conditions, and many other important factors are widely different for these nine cities, and yet the infant mortality under 1 month of age remains relatively constant.

No doubt the activities for the conservation of infant lives by health agencies in these various cities are widely different, yet the

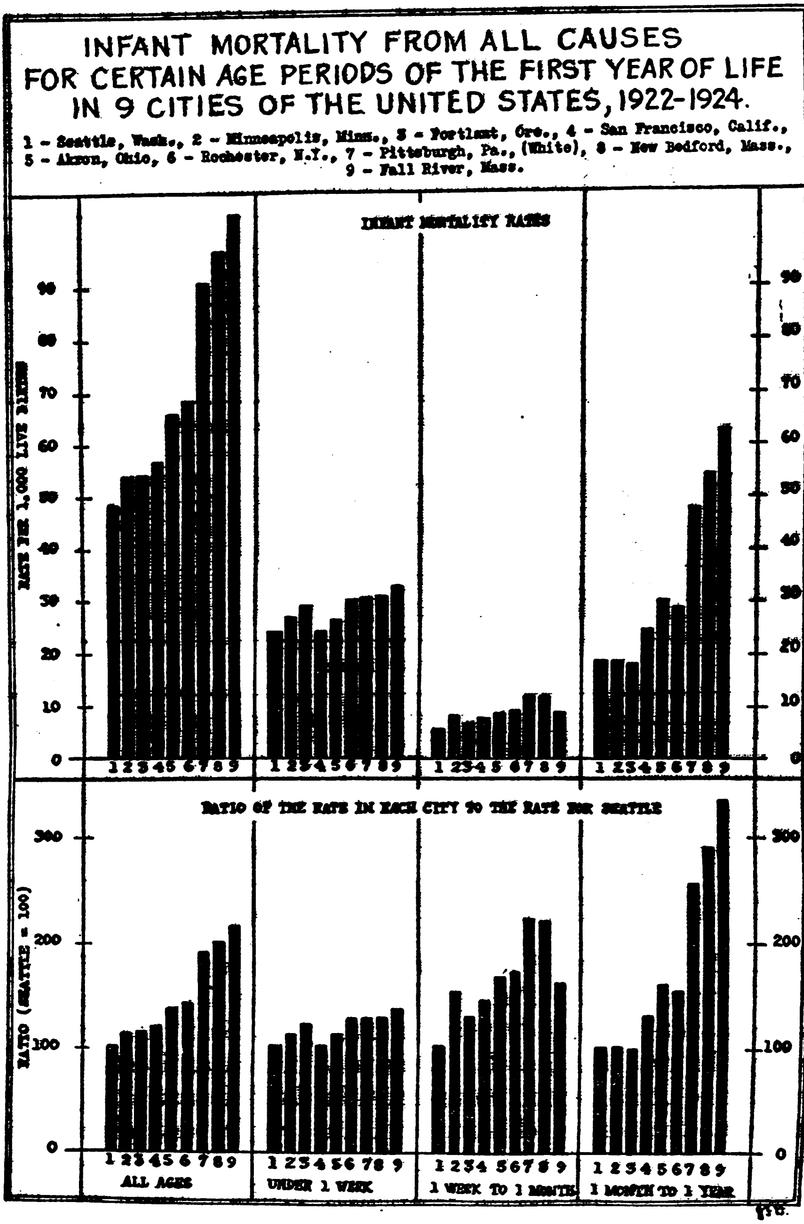


Fig. 2

death rates under 1 week of age are not at great variance. Evidently such measures as are at present taken to save infant lives have had little effect on deaths under 1 week of age.

TABLE 3.—*Infant mortality from certain causes at all ages under 1 year in nine selected cities of the United States, 1922–1924*

[Numbers following causes refer to International List of the Causes of Sickness and Death, 1920]

City	Infectious diseases of children [1] (7–10)	Other infectious diseases [2] (16, 21, 24, 29)	Tuberculosis (all forms) (31–37)	Pneumonia (all forms) and bronchitis (99–101)	Influenza (11)	Syphilis (38)	Diarrhea and enteritis (113)	Congenital malformations (159)	Congenital debility (160)	Premature birth (161A)	Injury at birth (161B)	Other diseases of early infancy (162–163)
INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS												
Seattle, Wash	1.31	0.50	0.81	5.30	1.93	1.00	2.56	6.24	1.68	15.78	3.93	1.81
Minneapolis, Minn	1.79	1.07	.69	7.55	.52	.76	2.56	5.89	1.55	17.82	4.76	2.10
Portland, Oreg	1.62	.65	.39	6.03	.97	.52	2.53	6.22	2.07	16.62	6.22	2.85
San Francisco, Calif	1.86	.64	1.33	10.20	.64	1.21	4.74	5.54	.76	16.27	4.67	2.81
Akron, Ohio	2.64	.57	.64	10.35	1.21	.50	6.21	5.78	2.21	20.83	3.92	1.78
Rochester, N. Y	2.80	.56	.56	9.06	.41	.81	11.91	7.28	.81	19.14	7.69	2.55
Pittsburgh, Pa	4.05	.83	1.11	16.98	1.37	1.78	17.22	9.14	2.34	19.80	5.92	2.77
New Bedford, Mass	4.49	.41	1.33	21.82	.61	1.12	18.04	7.75	2.65	16.82	6.42	6.22
Fall River, Mass	6.41	.84	1.11	18.57	1.02	.56	27.48	7.43	2.51	18.38	8.35	2.04
RATIO OF THE RATE IN EACH CITY TO THE RATE FOR SEATTLE (SEATTLE RATE=100)												
Seattle, Wash	100	100	100	100	100	100	100	100	100	100	100	100
Minneapolis, Minn	137	214	85	142	27	76	100	94	92	113	121	116
Portland, Oreg	124	130	48	114	50	52	99	100	123	112	158	157
San Francisco, Calif	142	128	164	192	33	121	185	89	45	103	119	155
Akron, Ohio	202	114	79	195	63	50	243	93	132	132	100	98
Rochester, N. Y	214	112	69	171	21	81	465	117	48	121	196	141
Pittsburgh, Pa	309	166	137	320	71	178	673	146	139	125	151	153
New Bedford, Mass	343	82	164	412	32	112	705	124	158	107	163	344
Fall River, Mass	489	168	137	350	53	56	1,073	119	149	116	212	113
NUMBER OF DEATHS												
Seattle, Wash	21	8	13	85	31	16	41	100	27	253	63	29
Minneapolis, Minn	52	31	20	219	15	22	74	171	45	517	138	61
Portland, Oreg	25	10	6	93	15	8	39	96	32	272	96	44
San Francisco, Calif	49	17	35	269	17	32	125	146	20	429	123	74
Akron, Ohio	37	8	9	145	17	7	87	81	31	292	55	25
Rochester, N. Y	55	11	11	178	8	16	234	143	16	376	151	50
Pittsburgh, Pa	171	35	47	717	58	75	727	386	99	836	250	117
New Bedford, Mass	44	4	13	214	6	11	177	76	26	165	63	61
Fall River, Mass	69	9	12	200	11	6	296	80	27	198	90	22

[1] Including measles, scarlet fever, whooping cough, and diphtheria.
[2] Including dysentery, erysipelas, meningococcus meningitis, and tetanus.

Table 3 and Figure 3 show infant death rates in the nine cities from different causes. The upper section shows actual rates and the middle section shows indices computed by dividing the rate for each city by the rate for Seattle. Diarrhea and enteritis stand out as the cause of death, which varies most in the different cities, but the infectious diseases of children and the respiratory diseases also show considerable variation from city to city. The group of causes at the right of the graph, congenital malformations, congenital debility, premature birth, injury at birth, and other diseases of early infancy, show relatively little variation in the different cities.

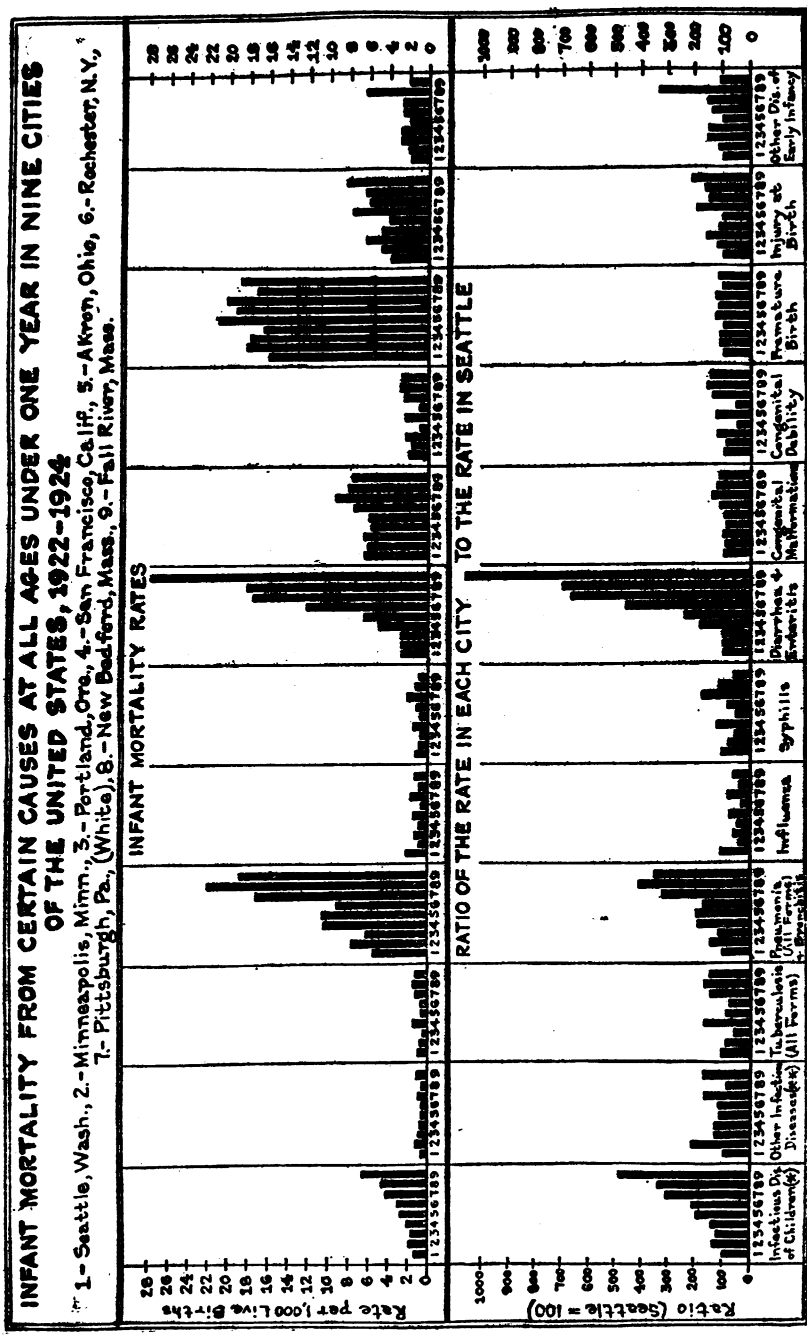


FIG. 3

* Includes measles, scarlet fever, whooping cough, and diphtheria. ** Includes dysentery, erysipelas, meningococcus meningitis, and tetanus.

Deaths from the causes which vary least in the different cities occur largely during the first month of life. Figures 2 and 3 reflect the same conditions.

The great problem of neonatal infant mortality remains before us and its fundamental causes appear to be the same throughout the civilized world.

APPENDIX

Table 4.—*Infant mortality from certain causes for certain age periods of the first year of life in nine selected cities of the United States, 1922–1924*

[Numbers following causes refer to International List of the Causes of Sickness and Death, 1920]

Age period and city	All causes	Infectious diseases of children [1] (7–10)	Other infectious diseases [2] (16, 21, 24, 29)	Tuberculosis (all forms) (31–37)	Pneumonia (all forms) and bronchitis (99–101)	Influenza (11)	Syphilis (38)	Diarrhea and enteritis (113)	Congenital malformations (159)	Congenital debility (160)	Premature birth (161A)	Injury at birth (161B)	Other diseases of early infancy (162–163)
INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS													
Under 1 week													
Seattle, Wash	24.33	----	----	----	0.31	0.06	0.31	0.06	3.31	0.69	13.66	3.56	1.50
Minneapolis, Minn	26.95	0.03	0.03	0.03	.31	.03	.21	.10	3.03	.55	15.10	4.31	1.76
Portland, Oreg	29.09	----	----	----	.32	.06	.32	----	3.05	1.36	14.77	5.70	2.27
San Francisco, Calif	24.43	----	----	----	.38	.04	.42	----	2.77	.19	13.65	4.17	2.20
Akron, Ohio	26.83	----	----	----	.21	----	.14	.14	2.71	.78	16.27	3.64	1.28
Rochester, N.Y	30.34	----	----	----	.25	----	.10	.25	4.22	.20	15.68	6.92	1.78
Pittsburgh, Pa	30.77	----	.02	----	.36	----	.17	.26	4.76	.43	15.58	5.52	2.34
New Bedford, Mass	30.48	----	----	----	.10	----	----	.10	4.49	.71	12.85	5.81	4.89
Fall River, Mass	32.58	----	----	----	----	----	----	----	4.36	1.39	15.41	.7.71	1.76
1 week to 1 month													
Seattle, Wash	5.36	----	.19	----	.62	.31	.06	.44	.81	.19	1.68	.31	.25
Minneapolis, Minn	8.03	.07	.38	.03	1.14	----	.14	.59	1.17	.38	2.14	.31	.28
Portland, Oreg	6.74	.13	.19	----	.78	.13	.06	.26	.78	.26	2.07	.52	.58
San Francisco, Calif	7.59	.08	.11	.08	1.29	.04	.08	.61	.95	.30	2.12	.38	.49
Akron, Ohio	8.78	.07	----	.07	1.43	.21	----	.50	1.07	.36	3.21	.29	.50
Rochester, N.Y	9.06	.10	.10	----	1.02	----	.31	1.07	1.17	.46	2.70	.76	.66
Pittsburgh, Pa	11.82	.09	.09	.05	1.73	.07	.17	1.85	1.94	.71	3.39	.36	.31
New Bedford, Mass	11.72	----	.20	----	1.22	.10	.51	1.84	1.33	.71	3.16	.61	1.02
Fall River, Mass	8.54	----	----	----	.93	----	----	1.95	.93	.46	2.23	.46	.28
1 month to 1 year													
Seattle, Wash	18.77	1.31	.31	.81	4.37	1.56	.62	2.06	2.12	.81	.44	.06	.06
Minneapolis, Minn	18.82	1.69	.65	.62	6.10	.48	.41	1.86	1.69	.62	.59	.14	.07
Portland, Oreg	18.33	1.49	.45	.39	4.92	.78	.13	2.27	2.40	.45	.78	----	----
San Francisco, Calif	24.62	1.78	.53	1.25	8.53	.57	.72	4.13	1.82	.27	.49	.11	.11
Akron, Ohio	29.97	2.57	.57	.57	8.70	1.00	.36	5.57	2.00	1.07	1.36	----	----
Rochester, N. Y	28.86	2.70	.46	.56	7.79	.41	.41	10.59	1.88	.15	.76	----	.10
Pittsburgh, Pa	47.91	3.96	.71	1.07	14.90	1.30	1.44	15.11	2.44	1.21	.83	.05	.12
New Bedford, Mass	54.34	4.49	20	1.33	20.49	.51	.61	16.11	1.94	1.22	.82	----	.31
Fall River, Mass	62.66	6.41	.84	1.11	17.64	1.02	.56	25.53	2.14	.65	.74	.19	----
NUMRER OF DEATHS													
Under 1 week													
Seattle, Wash	390	----	----	----	5	1	5	1	53	11	219	57	24
Minneapolis, Minn	782	1	1	1	9	1	6	3	88	16	438	125	51
Portland, Oreg	449	----	----	----	5	1	5	----	47	21	228	88	35
San Francisco, Calif	644	----	----	----	10	1	11	----	73	5	360	110	58
Akron, Ohio	376	----	----	----	3	----	2	2	38	11	228	51	18
Rochester, N.Y	506	----	----	----	5	----	2	5	83	4	308	136	35
Pittsburgh, Pa	1,299	----	1	----	15	----	7	11	201	18	658	233	99
New Bedford, Mass	299	----	----	----	1	----	----	1	44	7	126	57	48
Fall River, Mass	351	----	----	----	----	----	----	----	47	15	166	83	19

[1] Including measles, scarlet fever, whooping cough, and diphtheria.
[2] Including dysentery, erysipelas, meningococcus meningitis, and tetanus.

TABLE 4.—*Infant mortality from certain causes for certain age periods of the first year of life in nine selected cities of the United States, 1922–1924*—Continued

[Numbers following causes refer to International List of the Causes of Sickness and Death, 1922-1924]

Age period and city	All causes	Infectious diseases of children (7-10)	Other infectious diseases (16, 21, 24, 29)	Tuberculosis (all forms) (31-37)	Pneumonia (all forms) and bronchitis (99-101)	Influenza (11)	Syphilis (38)	Diarrhea and enteritis (113)	Congenital malformations (159)	Congenital debility (160)	Premature birth (161A)	Injury at birth (161B)	Other diseases of early infancy (162-163)
NUMBER OF DEATHS—continued													
1 week to 1 month													
Seattle, Wash	86	------	3	------	10	5	1	7	13	3	27	5	4
Minneapolis, Minn	233	2	11	1	33	------	4	17	34	11	62	9	8
Portland, Oreg	104	2	3	------	12	2	1	4	12	4	32	8	9
San Francisco, Calif	200	2	3	2	34	1	2	16	25	8	56	10	13
Akron, Ohio	123	1	------	1	20	3	------	7	15	5	45	4	7
Rochester, N. Y	178	2	2	------	20	------	6	21	23	9	53	15	13
Pittsburgh, Pa	499	4	4	2	73	3	7	78	82	30	143	15	13
New Bedford, Mass	115	------	2	------	12	1	5	18	13	7	31	6	10
Fall River, Mass	92	------	------	------	10	------	------	21	10	5	24	5	3
1 month to 1 year													
Seattle, Wash	301	21	5	13	70	25	10	33	34	13	7	1	1
Minneapolis, Minn	546	49	19	18	177	14	12	54	49	18	17	4	2
Portland, Oreg	283	23	7	6	76	12	2	35	37	7	12	------	------
San Francisco, Calif	649	47	14	33	225	15	19	109	48	7	13	3	3
Akron, Ohio	420	36	8	8	122	14	5	78	28	15	19	------	------
Rochester, N. Y	567	53	9	11	153	8	8	208	37	3	15	------	2
Pittsburgh, Pa	2,023	167	30	45	629	55	61	638	103	51	35	2	5
New Bedford, Mass	533	44	2	13	201	5	6	158	19	12	8	------	8
Fall River, Mass	675	69	9	12	190	11	6	275	23	7	8	2	------

COURT DECISIONS RELATING TO PUBLIC HEALTH

City held not liable for use of land as garbage dumping ground by city scavenger.—(Mississippi Supreme Court, Division B; City of Laurel *v.* Ingram, 114 So. 881; decided December 12, 1927.) An action for damages was brought against the city of Laurel on account of the use of plaintiff's land as a dumping ground for the garbage of the city. The city employed a scavenger to remove and dispose of garbage and other refuse matter, including dead animals, from residences and business places, as well as the city garbage and refuse proper. Fees for the scavenger's services were fixed by the city, and were paid by the property owners to the scavenger. The charges for the removal of the city garbage proper were paid by the city itself. The scavenger was to provide his own dumping ground, and the city retained no control over him as to how or where he should dispose of the garbage. The plaintiff recovered in the lower court and the city appealed. The supreme court took the view that the city was not liable, basing its decision on the ground that the scavenger was an independent contractor. The court said:

If the city scavenger, in the present case, was an independent contractor, it is wholly immaterial whether appellant, in providing for the disposition of garbage and dead animals, was acting in its governmental, or in its private corporate capacity. In either case, there would be no liability on the part of appellant for the damage done appellee's land by the scavenger in the performance of his work. The selection of the dumping ground would not be the act of appellant, but the act of the scavenger, the independent contractor, for which the latter alone would be liable to any person thereby injured.

We see no escape under the undisputed facts of this case from holding that the city scavenger was as much an independent contractor as the sanitary contractor was in the Shepperd Case. Knowledge on the part of the city authorities that the city scavenger was trespassing on appellee's property did not make the appellant liable; nor did the fact that, when appellee made complaint to the mayor of what was being done, the latter undertook to stop the practice. The mayor could not bind appellant in that manner. He had no right to direct the scavenger where to dump the garbage and dead animals.

Collection of ashes and rubbish held to be a governmental function.—(Ohio Court of Appeals, Cuyahoga County; Gorman *v.* City of Cleveland et al., 159 N. E. 136; decided May 2, 1927.) The plaintiff brought an action against a street railway company and the city of Cleveland to recover damages for injuries received while he was a passenger on a street car. It appeared that, while the plaintiff was attempting to alight from a street car, the car was struck in the rear by a city truck used to collect ashes and rubbish from residences and business places within the city, and that the plaintiff was injured when the sliding door on the street car closed upon his foot. The trial court rendered judgment in favor of the city on the ground that the collection of ashes and rubbish was a governmental, and not a proprietary, function. The court of appeals affirmed the judgment of the lower court.

PUBLIC HEALTH ENGINEERING ABSTRACTS

Summer Camps in Pennsylvania. H. M. Freeburn, *Public Health News*, New Jersey State Department of Health, vol. 12, No. 5, April, 1927, pp. 118–120. (Abstract by E. C. Sullivan.)

This article, which is a part of a paper read before a meeting of the New Jersey Sanitary Association on December 3, 1926, summarizes some of the work done by the Pennsylvania Department of Health in the supervision of summer camps. The work of inspecting such camps has rapidly increased; and since many of the camps are occupied by children, every effort is made by the bureau of engineering of the State Health Department to have such camps placed in a sanitary and healthful condition.

With the increased use of automobiles, dangerous water supplies and insanitary conditions along roads have become a greater menace than heretofore with respect to the possibilities of typhoid fever being contracted at road side stands and camps and being carried back to the cities. The problem has been handled in Pennsylvania by the establishment of a fully equipped bacteriological laboratory on a motor truck, detailed surveys of such supplies along highways, and the placarding with signs stating whether or not the water supplies are safe. Tourist camps have been included within the scope of this work.

The article gives the rules and regulations of the Commonwealth of Pennsylvania governing the establishment of camps, defining the word, and outlining the necessary requirements for their establishment and maintenance.

Estimation of Lighting in Schools. Anon. *The Medical Officer*, No. 986 (vol. 37, No. 25), June 18, 1927, p. 285. (Abstract by C. L. Pool.)

Lighting Birmingham schools was studied by comparing the illumination received on a screen in a given position with the illumination received from the whole hemisphere of the sky. The ratio was obtained by referring each reading to the illumination from a standard lamp. A coefficient of 0.01 indicates that the light received at a given point is equal to one-hundredth part of the light available from the total sky.

Readings were made near the middle and at the worst lighted parts of the room. Average readings varied from coefficients 0.0014 to 0.02 and "worst" readings from 0.00043 to 0.077. Standards were suggested for "good," "fair," "poor," and "bad lighting"—i. e., good lighting being indicated by coefficients of 0.02 (or above) to 0.007 in the middle of the room, and coefficients of 0.007 (or above) to 0.003 at the worst lighted points.

Poisoning by Carbon Monoxide Gas from Heaters, Motors, Etc. C. E. B. Waldron. *Health Bulletin*, State of Victoria, Australia, No. 10, April–June, 1927, pp. 311–319. (Abstract by Leonard Greenburg.)

The author of this paper describes the various means by which carbon monoxide is formed, and reiterates the fact that the ordinary gas heater may be a producer of carbon monoxide under certain conditions. Due to its extremely poisonous character, and the fact that it is colorless and odorless, carbon monoxide is a very subtle poison. Every bathroom in which a gas heater is installed, the author says, should be equipped with ample, permanent inlet and outlet ventilation, the inlet ventilation by an external wall vent situated just above the floor level, and the outlet vent about 1 foot below the ceiling. The flue of the gas heater should be carried through the roof space to the open air and cowled so as to prevent down drafts. Care should be exercised in locating the ventilating pipe to insure an up current, and for at least 4 feet the pipe should be vertical. In the absence of these precautions the room door and window should be left open.

The insidious onset of the effects of carbon monoxide are described and the symptoms presented in some detail. First-aid measures include the removal of the gassed victim and the use of emetics if the person is conscious. The administration of artificial respiration and the use of stimulants are described.

Report on the Working of the Corporation of Madras Water Analysis Laboratory for 1926. S. V. Ganapati. 62 pages. (Abstract by R. E. Thompson.)

Extensive tabulated analytical data are given. Consumption during the year was 15–19 m. g. per day, of which 12.73 m. g. was treated by slow sand filtration, the deficiency being made up with raw water from Red Hills Lake, the source of supply, which was chlorinated during the period July to December. There are 17 filters, 14 of 1 m. g. d. capacity and 3 of 1.33 m. g. d. capacity. Average length of filter run was 18 days, efficient length of run as regards rate of filtration being 10 days. Production of hydrogen sulphide in all beds continued to be a disconcerting feature, persisting even when chlorinated water was applied to filters. The water as supplied differed very little from raw water, the quality being considerably below all accepted standards. Hankinisation of city supply for short period when bleach supply failed gave rise to many complaints of objectionable colored growths due to manganese bacteria. Vibrios appeared in water in July and chlorination was immediately adopted. Chlorination of filtered water was rendered ineffective by the hydrogen sulphide present, and point of application was shifted to the raw water. Notwithstanding this treatment the vibrios persisted in the water supplied to the city. It was found that the vibrios were not true *V. cholerae*. Experiments on double filtration employing bed of coke for primary filtering medium followed by sand filtration at double the normal rate were unsuccessful.

Developing and Protecting Underground Water Supplies. J. G. Montgomery. Proceedings Ninth Texas Water Works Short School, January, 1927. pp. 125–129. (Abstract by W. M. Olson.)

Discusses protection of underground water supplies with particular reference to Texas conditions. Includes instructions developed by Layne-Texas Company to prevent pollution of new wells during construction and to provide initial disinfection upon completion. "After well has been completed and developed, six 2-ounce capsules of chloride of lime for each 100 gallons of water within the pipe should be sent to the bottom of the well. Well should not be pumped again for 48 hours."

Discussion of paper by Julian Montgomery presents data concerning supplies from the "sheet water" of West Texas. A quotation from Prof. E. W. Steel states conservative methods of protecting wells.

Detention Periods Required for Coagulation of Lake Erie Water at Cleveland. W. C. Lawrence. Sixth Annual Report of Ohio Conference on Water Purification, 1926. pp. 51–55. (Abstract by R. E. Thompson.)

Data obtained in study of retention periods required for coagulation at Cleveland plants are presented. Definite conclusions can not yet be formed as to most satisfactory detention period. While work was carried out solely for purpose of determining proper detention periods required to obtain good filter influent, it has resulted in saving in chemicals used to the extent of $5,500 in nine months.

Report of the Special Master to the Supreme Court of the United States in the cause entitled State of Wisconsin et al. v. State of Illinois and Sanitary District of Chicago, State of Missouri, et al. 197 pages. (Abstract by Arthur P. Miller.)

In the cause entitled State of Wisconsin et al. *v.* State of Illinois and Sanitary District of Chicago, State of Missouri, et al., intervening defendants, being No. 7, Original October term, 1927, the United States Supreme Court appointed as special master Charles E. Hughes. All the parties, complainants and defendants, presented their evidence and were heard in argument in Washington between November 8, 1926, and June 3, 1927.

In the special master's report the following are given as the questions of law:

"(1) Whether the complainants present a justiciable controversy and have the requisite interest to entitle them to invoke the jurisdiction of the court; and if so,

"(2) Whether the State of Illinois had the right, as against the complainants, to divert the waters of Lake Michigan in the manner and for the purposes shown, without the consent of the United States; and, if not,

"(3) Whether Congress has the authority to control the diversion; that is, in its regulation to determine whether and to what extent the diversion should be permitted; and if so,

"(4) Whether Congress has given the permission; and, if it has not directly,

"(5) Whether the Secretary of War had authority under the act of March 3, 1899, to regulate the diversion; and if so,

"(6) Whether the permit of March 3, 1925, and its conditions, are valid; and, finally,

"(7) As to the provisions of the decree which should be entered, in the light of the determination of these questions."

Mr. Hughes's conclusions on these questions of law were as follows:

"(1) That the complainants present a justiciable controversy.

"(2) That the State of Illinois and the Sanitary District of Chicago have no authority to make or continue the diversion in question without the consent of the United States.

"(3) That Congress has power to regulate the diversion; that is, to determine whether and to what extent it should be permitted.

"(4) That Congress has not directly authorized the diversion in question.

"(5) That Congress has conferred authority upon the Secretary of War to regulate the diversion, provided he acts in reasonable relation to the purpose of his delegated authority and not arbitrarily.

"(6) That the permit of March 3, 1925, is valid and effective according to its terms, the entire control of the diversion remaining with Congress."

The master's recommendations for decree are as follows:

"In the light of these conclusions, the bill, in my opinion, should be dismissed. I think, however, that if a situation should develop in which the defendants were seeking to create or continue a withdrawal of water from Lake Michigan without the sanction of Congress or of administrative officers acting under its authority, the complainant States have such an interest as would entitle them to bring a bill to restrain such action.

"I therefore recommend that the bill be dismissed without prejudice to the right of the complainants to institute suit to prevent a diversion of water from Lake Michigan in case such diversion is made or attempted without authority of law."

The Determination of Available Chlorine in Water-sterilizing Powder (Chlorine) by Means of the Horrocks Box and Hypo Tablets. S. Elliott. *Journal of the Royal Army Medical Corps,* vol. 49, No. 2, August 1927, pp. 116–118. (Abstract by S. H. Smith.)

A method, not as accurate as laboratory methods, but sufficiently so for rough work in the field, for determining the amount of available chlorine in water-sterlizing powders, is described. The method contemplates the use of the Horrocks box, but gives capacities of cups and scoops included in such box, and gives the strength of the few solutions used. The method is simple, and it should take only a few minutes to make such a test.

The Value of Methods for the Differentiation of Bacilli of the Coli-aerogenes Group, when Applied in Shanghai. E. P. Hicks. *Journal of Hygiene,* vol. 26, No. 3, August, 1927 pp. 357–361. (Abstract by C. T. Butterfield.)

The collection made of the coli-aerogenes group included the following strains: 100 from human, 50 from animals, and 50 from soil. The tests applied were: Methyl red, Voges-Proskauer, Koser's citrate, and indol production. Before each test the respective media were incubated for five days at 37° C.

Very little difference was noted between the fecal strains from human and animal sources. With the citrate test, 92.7 per cent of the human-animal strains failed to grow, while only 20 per cent of the soil strains failed. Indol was produced by 91.3 per cent of the strains from fecal sources and by 32 per cent of those from the soil. With the methyl red and Voges-Proskauer tests, 95.3 per cent of the fecal strains and 76 per cent of the soil strains were M. R. + and V. P. –. From this the author concludes in part that the citrate and indol tests are of value, the citrate being the better of the two, and that the methyl red and Voges-Proskauer tests are of no value.

Inasmuch as the soil samples were collected chiefly from railway embankments, rifle ranges, and the tops of grave mounds, it is possible that some fecal strains may have been present in the soil.

81883°—28——3

Discussion of Raw Water Chlorination Experiments at Sandusky. L. H. Enslow, Sixth Annual Report of the Ohio Conference on Water Purification, 1926, pp. 57–59. (Abstract by R. E. Tarbett.)

Chlorine, when first applied to water or sewage, combines with the organic substances having an avidity therefor; oxidation is not obtained until this demand is satisfied and free chlorine is present to a considerable extent.

Reduction of hydrogen ion concentration and phenol distinction require that a considerable excess of free chlorine be maintained. Increased coagulation efficiency due to prechlorination is probably caused by a change brought about in the colloidal substances.

In a number of Texas plants, algal growths in reservoirs have been controlled by chlorination of the entering water. In one plant the addition of a small amount of lime following the application of chlorine was found more efficacious than chlorine alone. Bacterial aftergrowths following chlorination would appear to have little significance from standpoint of nuisance or pathogenic quality.

Superchlorination followed by dechlorination with liquid sulphur dioxide for elimination of tastes and odors from chlor-substitution products has been successful at Toronto. Contact of one hour is allowed, the residual chlorine being 0.3 to 0.6 p. p. m. at time of dechlorination. This residual is reduced to 0.1 p. p. m. Sulphur dioxide is added in same manner as liquid chlorine.

Supervision of Public Water Supplies in Connecticut. Warren J. Scott, *Connecticut Health Bulletin*, vol. 41, No. 11, November, 1927, pp. 235–239. (Abstract by H. V. Pedersen.)

This article is a brief summary of the effort the State department of health is constantly making to safeguard and improve the public water supplies of the State. Some of the activities discussed are listed as follows: (1) Inspection of watersheds; (2) chlorination plant inspection; (3) filter plant inspection; (4) investigation of complaints; (5) surveys of adequacies of supplies; (6) supervision of cross connections; (7) approval of new supplies; (8) periodic testing of all public water supplies.

The author quotes from the Connecticut statutes the power invested in the health department to protect public water supplies and discusses briefly, in an interesting and instructive way, the activities of the bureau of sanitary engineering.

Sanitary Scoring of Water Supplies. Anon. *Public Works*, vol. 58, No. 10, October, 1927, pp. 386–388. (Abstract by R. J. Faust.)

The object of the score system is to list the many sanitary dangers, the several protective measures, and the desirable qualities of the water delivered. The assignment of numerical penalties and credits is for the purpose of indicating relative values in an approximately quantitative way. The committee of the New England Water Works Association, which presented the scoring system as outlined in the article, does not pretend that the values given are the best that can be selected, nor that they are exact, but it does believe that the values are relatively reasonable. An outline of the score system is included in the article.

Aeration of Water and Sewage. Anon. *Public Works*, vol. 58, No. 10, October 1927, pp. 366–367. (Abstract by R. J. Faust.)

To prove that considerable aeration takes place from the surface of the air bubbles as they ascend through a column of water, special experimental apparatus was devised. This apparatus eliminates the criticism that a bulk of the aeration comes by "streaming" from the upper surface when the bubbles break. A picture of the apparatus and an explanation of the experiment are given. The results are in tabular form and show conclusively that aeration takes place from the surface of air bubbles as they ascend through water.

Note on the Aeration of Water. Gilbert J. Fowler and S. N. Chatterjee. *The Surveyor*, vol. 72, No. 1855, August 12, 1927, p. 139. (Abstract by D. C. Ruchhoft.)

An apparatus, consisting principally of 3 aspirator bottles and an aeration chamber made of the outer jacket of a Liebig condenser, arranged to determine the amount of oxygen that is dissolved from surface streaming and from air bubbles passing through the liquid in the condenser is described. When water containing about 1.0 p. p. m. of dissolved oxygen was allowed to stand in the condenser with only a small tube open to the air the oxygen content was increased to 1.2 p. p. m. in 24 hours. When the condenser was not quite full, leaving an area of water equal to the cross section of the condenser exposed, the solution of oxygen from the streaming effect was increased to 5.0 p. p. m. after standing an additional 24 hours. However, if air was slowly bubbled through the water in the condenser for only ten minutes, the oxygen content was increased from 1.0 to 5.0 p. p. m. The authors present this experiment to controvert the opinion that probably only a very minute quantity of oxygen is absorbed by sewage as air passes through it and that most of the aeration takes place at the surface.

Historical Review of Development of Control of Disease-Bearing Mosquitoes. J. A. LePrince. Proceedings of the American Society of Civil Engineers, Part I, September, 1927, pp. 1637–1640. (Abstract by L. L. Williams.)

This is a brief outline of the history of yellow fever and malaria. Yellow fever was last seen in this country in 1905. Savannah, Georgia, was the first city to make a serious attempt at malaria reduction, when they passed a law forbidding the maintenance of wet-culture (as rice culture was then called) near the city, and reimbursed the landowners for loss of potential crops. It details the wide extent of malaria up to the eightys, and shows a gradual decrease of malaria through extension of intensive farm drainage and improved living conditions, reduction of the cost and more general use of quinine, and the provision of metallic screens for the protection of homes. The first mosquito campaign was begun by Americans in Habana in 1901, against both yellow fever and malaria. The first antimosquito campaign in the United States was in connection with control of yellow fever in New Orleans, in 1905. Campaigns against malaria and the control of the disease due to mosquitoes in the United States were started in 1913, when surveys were first made in Virginia-North Carolina by Dr. H. R. Carter, of the United States Public Health Service. The first Federal appropriation of $16,000 was made in 1914 to the Public Health Service for investigations in malaria. Additional money has been furnished, and these investigations have continued to the present time.

The author estimates that extra-cantonment malaria work prevented the loss of approximately 5,000 men by death from malaria. After the World War the United States Public Health Service cooperated with the International Health Board and the State health departments in Southern States and started malaria-control activities in fourteen States. This control work still continues. Prior to 1914, less than six communities had undertaken malaria-control measures and the results were unsatisfactory. Since 1914, malaria-control measures have been satisfactory in 343 communities and 216 counties in 17 States; and surveys, control measures, and investigations have been carried on in 667 communities in 376 counties in 24 States.

It has been the author's good fortune to take an active part in all of the campaigns, commencing at Habana, Cuba, in 1901; with Gorgas and Carter in the Canal Zone; and then back to active work in the United States. "Every indication points to a reduction in malaria throughout the United States at a rate equal to, or possibly even more rapid rate than, that which has been attained in the past twenty-five years. Should this prove true, it needs no prophet to foretell the outcome."

Paris Green as a Larvicide. Carlos Del Negro. *Archivos De Hygiene*, Department of Health, Brazil, vol. 1, No. 2, September, 1927, pp. 143–158.

"First. In a series of experiments carried out in Campos (State of Rio, Brazil), Paris green as a larvicide was found successful over any kind of vegetation. After the third, fourth, fifth, and sixth experiments, anopheline larvae were found living only at the percentages of 3, 4, 0.8, and 3, respectively. The used batch of Paris green contained only 40 per cent of arsenious acid.

"Second. The larvicide is employed in a mixture of 1 liter to 100 liters of dirt to 10,000 square meters of marsh. It was very difficult to maintain this rate.

"Third. The larvicide had no action on the pupae.

"Fourth. It was not harmful to the other swamp inhabitants, including the culicine larvae."

DEATHS DURING WEEK ENDED FEBRUARY 4, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended February 4, 1928, and corresponding week of 1927. (From the Weekly Health Index, February 8, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Feb. 4, 1928	Corresponding week 1927
Policies in force	70, 192, 320	66, 658, 783
Number of death claims	13, 911	13, 939
Death claims per 1,000 policies in force, annual rate	10. 4	10. 9

Deaths from all causes in certain large cities of the United States during the week ended February 4, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, February 8, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Feb. 4, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 4, 1928 [2]
	Total deaths	Death rate [1]		Week ended Feb. 4, 1928	Corresponding week 1927	
Total (67 cities)	7, 532	13. 6	14. 0	703	835	[3] 61
Albany [4]	31	13. 5	16. 1	3	4	61
Atlanta	83	17. 1	16. 8	7	10	
White	46		13. 1	6	3	
Colored	37	(5)	25. 4	1	7	
Baltimore [4]	235	14. 8	15. 7	17	24	54
White	184		13. 9	15	16	60
Colored	51	(5)	26. 4	2	8	31
Birmingham	73	17. 2	16. 8	7	10	60
White	31		12. 6	3	1	41
Colored	42	(5)	23. 4	4	9	90
Boston	217	14. 2	15. 5	24	26	66
Bridgeport	28			4	1	73
Buffalo	146	13. 7	15. 0	13	13	56
Cambridge	37	15. 4	14. 3	4	7	71
Camden	37	14. 3	13. 7	3	6	48
Canton	24	10. 7	6. 9	1	3	24
Chicago [4]	863	14. 3	13. 0	70	104	60
Cincinnati	126	15. 9	18. 0	13	18	79
Cleveland	179	9. 3	10. 2	21	16	57
Columbus	87	15. 3	14. 5	6	12	56
Dallas	46	11. 1	13. 3	2	7	
White	37		10. 8	1	4	
Colored	9	(5)	30. 4	1	3	
Dayton	40	11. 3	15. 6	2	4	33

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended February 4, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, February 8, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Feb. 4, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 4, 1928 [2]
	Total deaths	Death rate [1]		Week ended Feb. 4, 1928	Corresponding week 1927	
Denver	103	18.3	15.1	15	11	
Des Moines	31	10.7	7.0	2	3	33
Duluth	22	9.8	10.5	1	1	23
El Paso	40	17.8	14.7	5	4	
Erie	23			1	3	21
Fall River [4]	21	8.2	12.2	6	3	103
Flint	21	7.4	12.4	3	10	38
Fort Worth	40	12.4	11.2	0	4	
White	28		11.6	0	4	
Colored	12	(5)	8.0	0	0	
Grand Rapids	27	8.6	10.6	2	7	30
Houston	61			8	11	
White	49			6	9	
Colored	12	(5)		2	2	
Indianapolis	100	13.7	14.2	14	11	107
White	84		14.1	10	9	87
Colored	16	(5)	15.1	4	2	243
Jersey City	85	13.7	12.0	14	7	105
Kansas City, Kans	32	14.1	13.3	2	6	42
White	25		14.1	2	5	49
Colored	7	(5)	9.8	0	1	0
Kansas City, Mo	113	15.1	13.5	9	18	64
Knoxville	31	15.4	16.3	3	1	65
White	23		13.9	3	1	73
Colored	8	(5)	34.2	0	0	0
Los Angeles	240			11	21	31
Louisville	48	7.6	15.3	6	4	50
White	35		12.7	5	1	48
Colored	13	(5)	29.9	1	3	69
Lowell	20	9.5	14.2	1	4	21
Lynn	30	14.9	14.9	2	2	50
Memphis	68	18.7	16.6	4	4	47
White	37		14.4	2	0	37
Colored	31	(5)	20.6	2	4	63
Milwaukee	121	11.6	10.8	12	15	54
Minneapolis	108	12.4	11.6	5	9	30
Nashville	47	17.7	19.7	1	7	16
White	30		19.0	0	7	0
Colored	17	(5)	21.4	1	0	60
New Bedford	32	14.0	20.9	9	8	195
New Haven	36	10.0	12.4	1	2	14
New Orleans	143	17.4	17.2	18	16	87
White	87		14.6	9	9	65
Colored	56	(5)	24.6	9	7	131
New York	1,607	14.0	13.7	177	172	71
Bronx Borough	194	10.7	11.5	12	17	36
Brooklyn Borough	534	12.1	12.3	75	65	75
Manhattan Borough	651	19.4	18.3	69	70	82
Queens Borough	170	10.4	9.9	18	18	72
Richmond Borough	58	20.1	15.3	3	2	54
Newark, N. J	107	11.8	12.5	15	15	77
Oakland	64	12.2	11.3	4	5	43
Oklahoma City	36			0	5	
Omaha	73	17.1	17.4	4	7	46
Paterson	43	15.5	16.3	5	4	87
Philadelphia	513	13.0	14.7	48	51	65
Pittsburgh	164	12.8	17.7	22	29	72
Portland, Oreg	73			7	9	75
Providence	65	11.9	12.6	6	7	52
Richmond	45	12.1	15.5	5	2	65
White	29		13.4	3	0	61
Colored	16	(5)	20.6	2	2	73
Rochester	90	14.3	13.5	8	9	65
St. Louis	259	16.0	14.2	14	13	47
St. Paul	56	11.6	9.6	2	7	19
Salt Lake City [4]	28	10.6	16.1	2	5	33
San Antonio	53	12.7	14.8	6	5	
San Diego	49	21.4	19.0	3	4	57
San Francisco	185	16.5	18.0	8	10	50
Schenectady	24	13.4	13.4	2	3	63

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended February 4, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, February 8, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Feb. 4, 1928		Annual death rate per 1,000 corresponding week 1927	Deaths under 1 year		Infant mortality rate, week ended Feb. 4, 1928 [2]
	Total deaths	Death rate [1]		Week ended Feb. 4, 1928	Corresponding week 1927	
Somerville	22	11.2	9.8	6	3	207
Spokane	26	12.5	12.4	1	2	28
Springfield, Mass	42	14.7	12.7	5	4	79
Syracuse	59	15.5	16.1	3	9	36
Tacoma	28	12.3	11.2	2	2	51
Toledo	76	12.7	11.6	5	8	48
Trenton	31	11.7	15.3	2	3	34
Washington, D. C	150	14.2	15.9	9	17	51
White	107		12.9	5	9	41
Colored	43	(5)	24.9	4	8	74
Waterbury	24			2	5	58
Wilmington, Del	27	11.0	9.1	0	0	0
Worcester	47	12.4	15.2	4	5	49
Yonkers	24	10.3	8.8	3	7	68
Youngstown	34	10.2	13.9	4	6	53

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 66 cities.
[4] Deaths for week ended Friday, Feb. 3, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Reports for Weeks Ended February 12, 1927, and February 11, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 12, 1927, and February 11, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928
New England States:								
Maine	1	5	12	4	280	44	0	0
New Hampshire		2		20		73		0
Vermont	3	1			101	4	0	0
Masachusetts	116	117	17	14	265	1,598	0	2
Rhode Island	6	13				5	0	0
Connecticut	31	43	5	3	121	280	2	1
Middle Atlantic States:								
New York	313	401	[1] 102	[1] 40	708	1,461	6	11
New Jersey	106	145	31	31	49	423	2	1
Pennsylvania	204	238			942	1,129	3	2
East North Central States:								
Ohio		193		32		352		2
Indiana	31	49	44	30	261	162	0	0
Illinois	111	191	37	40	1,854	101	2	7
Michigan	103	78		4	117	191	0	2
Wisconsin	41	38	131	75	765	95	10	3
West North Central States:								
Minnesota	32	29			446	2	2	1
Iowa [2]	28	24			425	65	2	0
Missouri	61	51	11	8	198	97	1	4
North Dakota	3	3	4		131	17	2	0
South Dakota	11	9	2		130	14	0	2
Nebraska	4	21	25	10	204	3	1	1
Kansas	31	45	2	39	387	22	0	0
South Atlantic States:								
Delaware	2		1	4	4	8	0	1
Maryland [2]	55	23	63	35	24	563	0	1
District of Columbia	25	31	12	1	3	36	0	0
Virginia								
West Virginia	27	13	37	24	164	85	0	0
North Carolina	34	46			227	4,734	1	1
South Carolina	28	19	1,363	1,246	29	1,428	0	0
Georgia	25	12	174	220	139	196	1	0
Florida	48	19	18	15	35	24	2	0
East South Central States:								
Kentucky		5		11		296		0
Tennessee	13	14	70	115	72	329	4	2
Alabama	36	33	131	287	180	192	3	0
Mississippi	12	27						

[1] New York City only.
[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 12, 1927, and February 11, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928
West South Central States:								
Arkansas	10	13	99	189	16	491	0	0
Louisiana	73	23	41	71	110	197	0	0
Oklahoma [3]	22	23	242	221	126	134	1	2
Texas	57	48	70	146	18	195	0	1
Mountain States:								
Montana	5	11			113	3	1	7
Idaho	1				93		1	
Wyoming	3	2	1		379	23	0	1
Colorado		41		3		82		16
New Mexico	4	3	5	47	21	151	0	0
Arizona	1	24		1	29	27	1	6
Utah [1]	4		3	3	263	3	0	1
Nevada								
Pacific States:								
Washington	37	7	7		259	275	6	6
Oregon	17	16	331	29	75	46	1	0
California	139	113	101	56	2,377	149	7	10

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928
New England States:								
Maine	0	0	17	27	0	0	3	2
New Hampshire		0		40		0		0
Vermont	0	0	8	12	0	0	0	0
Massachusetts	1	2	499	356	0	0	9	6
Rhode Island	0	0	21	44	0	0	0	1
Connecticut	0	0	101	114	0	6	0	2
Middle Atlantic States:								
New York	3	3	816	828	10	16	29	14
New Jersey	0	0	296	306	0	1	3	6
Pennsylvania	0	4	724	605	1	0	33	16
East North Central States:								
Ohio		3		415		27		7
Indiana	0	0	451	143	128	101	5	5
Illinois	1	2	326	366	38	42	16	19
Michigan	0	3	328	363	38	32	6	7
Wisconsin	0	4	232	196	11	14	0	2
West North Central States:								
Minnesota	0	0	281	159	19	1	4	3
Iowa [2]	1	0	78	102	10	66	9	2
Missouri	0	0	159	109	6	62	6	0
North Dakota	0	0	58	47	11	3	2	4
South Dakota	0	2	106	90	2	9	0	0
Nebraska	0	1	41	101	15	53	1	3
Kansas	1	0	183	128	49	109	1	0
South Atlantic States:								
Delaware	0	0	28	2	0	0	0	0
Maryland [2]	0	0	99	62	0	0	11	5
District of Columbia	0	0	18	42	0	0	1	0
Virginia		1				0		0
West Virginia	0	0	70	56	12	41	17	14
North Carolina	0	0	56	46	45	142	5	2
South Carolina	3	1	17	6	7	15	7	4
Georgia	0	0	32	11	143	0	4	4
Florida	0	0	10	18	59	10	5	2
East South Central States:								
Kentucky		0		38		13		3
Tennessee	0	1	65	26	14	10	12	5
Alabama	0	0	16	14	57	10	4	8
Mississippi	0	0	11	20	11	11	5	4
West South Central States:								
Arkansas	0	0	19	66	3	10	6	7
Louisiana	0	0	15	17	6	23	12	10
Oklahoma [3]	0	1	47	46	52	135	17	18
Texas	0	0	52	110	56	120	0	6

[2] Week ended Friday.

[3] Exclusive of Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 12, 1927, and February 11, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928	Week ended Feb. 12, 1927	Week ended Feb. 11, 1928
Mountain States:								
Montana	0	0	113	20	7	27	0	0
Idaho	0		30		3		2	
Wyoming	0	0	23	24	0	2	0	0
Colorado		1		137		14		2
New Mexico	0	0	32	31	4	0	4	3
Arizona	0	0	58	13	1	16	0	2
Utah [2]	0	1	17	5	1	4	1	1
Nevada								
Pacific States:								
Washington	0	1	128	48	39	70	2	4
Oregon	0	2	46	22	11	44	8	0
California	2	12	267	188	21	20	10	5

[2] Week ended Friday.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December, 1927										
Hawaii Territory	3	30	4		7		2	2	0	6
Indiana	3	216	127		178		11	421	[1] 357	24
Oregon	9	63	110		82		64	134	180	22
Virginia	3	279	2,421	45	743	13	2	287	3	34
January, 1928										
Arizona	10	60			64	2	2	24	9	7
Connecticut	2	177	23	1	606		3	496	125	5
Florida	2	67	43	22	29	1		45	19	30
Nebraska	8	49	17		37		2	322	161	6

[1] Corrected report.

December, 1927	Cases
Chicken pox:	
Hawaii Territory	18
Indiana	322
Oregon	249
Virginia	583
Conjunctivitis:	
Hawaii Territory	58
Dysentery:	
Virginia	41
Favus:	
Oregon	1
Hookworm disease:	
Virginia	7
Impetigo contagiosa:	
Oregon	9
Leprosy:	
Hawaii Territory	2
Lethargic encephalitis:	
Oregon	1
Mumps:	
Hawaii Territory	18
Indiana	68
Oregon	62
Paratyphoid fever:	
Hawaii Territory	2
Scabies:	
Oregon	26
Septic sore throat:	
Oregon	7
Tetanus:	
Hawaii Territory	1
Trachoma:	
Hawaii Territory	101
Trench mouth:	
Oregon	1
Whooping cough:	
Indiana	77
Oregon	18
Virginia	401
January, 1928	
Anthrax:	
Nebraska	1
Chicken pox:	
Arizona	51
Connecticut	582
Florida	172
Nebraska	274
Conjunctivitis:	
Connecticut	3
Dengue:	
Florida	2

	Cases
Dysentery:	
Florida	5
Favus:	
Connecticut	1
German measles:	
Connecticut	17
Nebraska	4
Hookworm disease:	
Florida	57
Lethargic encephalitis:	
Connecticut	3
Mumps:	
Arizona	17
Connecticut	390
Florida	19
Nebraska	125
Paratyphoid fever:	
Connecticut	3

	Cases
Rabies in animals:	
Connecticut	3
Rabies in man:	
Arizona	1
Septic sore throat:	
Connecticut	12
Nebraska	9
Tetanus:	
Connecticut	2
Florida	8
Trachoma:	
Arizona	10
Typhus fever:	
Florida	2
Whooping cough:	
Arizona	24
Connecticut	516
Florida	6
Nebraska	47

Number of cases of certain communicable diseases reported for the month of November, 1927, by State health officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Alabama	81	434	75	33	138	28	300	100	77
Arizona	40	74	57	4	19	0	116	9	29
Arkansas	136	171	89	22	88	11	[1] 64	82	62
California	1,346	747	261	348	794	52	916	46	504
Colorado [2]									
Connecticut	525	136	105	193	223	0	114	18	332
Delaware	8	12	42	35	15	0	3	4	11
District of Columbia	63	92	4		109	2	90	9	20
Florida	14	161	6	23	47	8	59	17	5
Georgia	58	178	86	21	112	7	44	85	12
Idaho	104	15	12	97	105	36	[1] 7	2	9
Illinois	1,402	787	120	523	999	120	850	122	731
Indiana	272	245	44	16	481	237	158	27	86
Iowa	180	96	7	143	227	185	39	12	25
Kansas	702	154	216	61	447	139	156	19	222
Kentucky [3]									
Louisiana	56	252	85	22	80	30	[1] 189	60	38
Maine	154	14	190	70	189	0	16	18	48
Maryland	378	177	206	53	223	0	219	72	110
Massachusetts	958	542	1,221	402	968	1	474	39	606
Michigan	659	493	530	548	814	71	453	62	408
Minnesota	678	240	16		632	5	337	24	38
Mississippi	615	351	1,593	448	184	17	279	68	1,030
Missouri	263	372	65	158	390	308	185	86	159
Montana	167	11	2	1	100	109	31	4	28
Nebraska	186	73	36	72	148	33	15	15	59
Nevada [4]									
New Hampshire		15			37			1	
New Jersey	738	747	212		477	0	364	41	630
New Mexico [2]									
New York	1,840	1,515	738	985	1,280	35	1,919	204	1,511
North Carolina	351	615	2,479		520	90		64	448
North Dakota	136	16	20	8	195	35	12	6	10
Ohio	1,473	987	193	514	1,013	46	565	109	403
Oklahoma [5]	157	392	124	15	147	94	43	146	23
Oregon	133	80	69	30	87	135	35	32	17
Pennsylvania	2,832	1,187	1,735	1,292	1,626	0	656	132	711
Rhode Island	31	123	9	90	122	1	42	5	12
South Carolina	118	599	758		155	37	140	128	301
South Dakota	37	25	70	21	191	13	6	13	20
Tennessee	128	247	386	32	223	19	114	138	59
Texas [2]									
Utah [3]									
Vermont	205	10	22	45	47	0	[1] 10	0	154
Virginia	632	564	654		404	24	[1] 145	94	369
Washington	435	179	633	274	210	104	181	25	38
West Virginia	179	99	48		238	18	35	62	32
Wisconsin	898	149	322	237	480	99	121	15	254
Wyoming	112	8	33	4	88	33	1	3	74

[1] Pulmonary.
[2] Report not received at time of going to press.
[3] Reports received weekly.
[4] Reports received annually.
[5] Exclusive of Oklahoma City and Tulsa.

Case rates per 1,000 population (annual basis) for the month of November, 1927

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Alabama	0.39	2.07	0.36	0.16	0.66	0.13	1.43	0.48	0.37
Arizona	1.06	1.96	1.51	.11	.50	.00	3.07	.24	.77
Arkansas	.86	1.08	.56	.14	.56	.07	[1].40	.52	.39
California	3.69	2.05	.72	.96	2.18	.14	2.51	.13	1.38
Colorado [2]	-------	-------	-------	-------	-------	-------	-------	-------	-------
Connecticut	3.90	1.01	.78	1.44	1.66	.00	.85	.13	2.47
Delaware	.40	.60	2.10	1.75	.75	.00	.15	.20	.55
District of Columbia	1.42	2.07	.09	-------	2.46	.05	2.03	.20	.45
Florida	.12	1.44	.05	.21	.42	.07	.53	.15	.04
Georgia	.22	.68	.33	.08	.43	.03	.17	.33	.05
Idaho	2.37	.34	.27	2.21	2.39	.82	[1].16	.05	.21
Illinois	2.34	1.31	.20	.87	1.67	.20	1.42	.20	1.22
Indiana	1.05	.95	.17	.06	1.86	.92	.61	.10	.33
Iowa	.90	.48	.04	.72	1.14	.93	.20	.06	.13
Kansas	4.67	1.03	1.44	.41	2.98	.93	1.04	.13	1.48
Kentucky [3]	-------	-------	-------	-------	-------	-------	-------	-------	-------
Louisiana	.35	1.59	.53	.14	.50	.19	[1] 1.19	.38	.24
Maine	2.36	.21	2.92	1.07	2.90	.00	.25	.28	.74
Maryland	2.88	1.35	1.57	.40	1.70	.00	1.67	.55	.84
Massachusetts	2.75	1.55	3.50	1.15	2.78	.00	1.36	.11	1.74
Michigan	1.79	1.34	1.44	1.49	2.21	.19	1.23	.17	1.11
Minnesota	3.07	1.09	.07	-------	2.86	.02	1.53	.11	.17
Mississippi	4.18	2.39	10.82	3.04	1.25	.12	1.90	.46	7.00
Missouri	.91	1.29	.23	.55	1.35	1.07	.64	.30	.55
Montana	2.85	.19	.03	.02	1.70	1.86	.53	.07	.48
Nebraska	1.62	.64	.31	.63	1.29	.29	.13	.13	.51
Nevada [4]	-------	-------	-------	-------	-------	-------	-------	-------	-------
New Hampshire	-------	.40	-------	-------	.99	-------	-------	.03	-------
New Jersey	2.39	2.42	.69	-------	1.55	-------	1.18	.13	2.04
New Mexico [2]	-------	-------	-------	-------	-------	-------	-------	-------	-------
New York	1.96	1.61	.79	1.05	1.36	.04	2.04	.22	1.61
North Carolina	1.47	2.58	10.41	-------	2.18	.38	-------	.27	1.88
North Dakota	2.58	.30	.38	.15	3.70	.66	.23	.11	.19
Ohio	2.67	1.79	.35	.93	1.84	.08	1.02	.20	.73
Oklahoma [5]	.90	2.25	.71	.09	.84	.54	.25	.84	.13
Oregon	1.82	1.09	.94	.41	1.19	1.85	.48	.44	.23
Pennsylvania	3.54	1.48	2.17	1.62	2.03	.00	.82	.17	.89
Rhode Island	.54	2.13	.16	1.56	2.11	.02	.73	.09	.21
South Carolina	.78	3.95	5.00	-------	1.02	.24	.92	.84	1.98
South Dakota	.65	.44	1.22	.37	3.34	.23	.10	.23	.35
Tennessee	.63	1.21	1.89	.16	1.09	.09	.56	.68	.29
Texas [2]	-------	-------	-------	-------	-------	-------	-------	-------	-------
Utah [3]	-------	-------	-------	-------	-------	-------	-------	-------	-------
Vermont	7.08	.35	.76	1.55	1.62	.00	[1].35	.00	5.32
Virginia	3.02	2.70	3.13	-------	1.93	.11	[1].69	.45	1.76
Washington	3.39	1.39	4.93	2.13	1.64	.81	1.41	.19	.30
West Virginia	1.28	.71	.34	-------	1.71	.13	.25	.44	.23
Wisconsin	3.74	.62	1.34	.99	2.00	.41	.50	.06	1.06
Wyoming	5.65	.40	1.67	.20	4.44	1.67	.05	.15	3.74

[1] Pulmonary.
[2] Report not received at time of going to press.
[3] Reports received weekly.
[4] Reports received annually.
[5] Exclusive of Oklahoma City and Tulsa.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 96 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 30,890,000. The estimated population of the 91 cities reporting deaths is about 30,230,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended January 28, 1928, and January 29, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
43 States	2,182	2,001	
96 cities	1,147	1,049	1,083
Measles:			
42 States	12,410	9,972	
96 cities	3,398	2,524	
Poliomyelitis:			
43 States	51	25	
Scarlet fever:			
43 States	4,793	5,964	
96 cities	1,644	2,262	1,471
Smallpox:			
43 States	1,164	1,070	
96 cities	137	151	111
Typhoid fever:			
43 States	247	217	
96 cities	50	43	45
Deaths reported			
Influenza and pneumonia:			
91 cities	1,035	1,041	
Smallpox:			
91 cities	0	0	

City reports for week ended January 28, 1928

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

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

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	2	1	1	0	0	1	9	1
New Hampshire:									
Concord	¹ 22,546	0	1	0	0	0	2	0	1
Manchester	84,000	0	2	0	0	0	4	0	1
Vermont:									
Barre	¹ 10,008	1	1	0	0	0	0	0	0
Burlington	¹ 24,089	2	1	0	0	0	0	0	2
Massachusetts:									
Boston	787,000	90	55	26	3	2	347	6	27
Fall River	131,000	2	6	6	2	0	0	0	1
Springfield	145,000	9	3	9	1	0	1	49	1
Worcester	193,000	13	6	0	2	0	3	81	1
Rhode Island:									
Pawtucket	71,000	8	2	1	0	0	0	5	4
Providence	275,000	4	10	15	0	0	0	10	3
Connecticut:									
Bridgeport	(²)	6	8	6	3	1	3	4	3
Hartford	164,000	16	8	9	0	0	2	3	5
New Haven	182,000	8	3	2	0	0	110	24	8

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

City reports for week ended January 28, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	31	15	18		0	412	44	18
New York	5,924,000	218	213	351	83	20	179	21	229
Rochester	321,000	17	13	9		0	7	15	8
Syracuse	185,000	30	5	0		0	69	6	2
New Jersey:									
Camden	131,000	1	5	14	0	0	1	0	3
Newark	459,000	29	16	23	7	0	102	20	16
Trenton	134,000	1	5	4	0	0	3	0	5
Pennsylvania:									
Philadelphia	2,008,000	135	82	59		6	61	129	59
Pittsburgh	637,000	42	20	36		6	157	93	30
Reading	114,000	20	4	2		0	0	1	5
Scranton	143,000	17		18			0	0	
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	25	11	10	0	1	248	4	11
Cleveland	960,000	89	35	86	4	3	26	169	17
Columbus	285,000		5						
Toledo	295,000	57	9	4	3	2	128	17	6
Indiana:									
Fort Wayne	99,900	2	4	2	0	0	1	0	4
Indianapolis	367,000	15	10	9	0	1	29	58	16
South Bend	81,700	5	1	0	0	0	0	0	1
Terre Haute	71,900	5	1	2	0	1	0	0	0
Illinois:									
Chicago	3,048,000	147	94	106	12	3	18	44	76
Springfield	64,700	7	1	1	1	0	0	24	0
Michigan:									
Detroit	1,290,000	57	67	37	4	3	221	36	30
Flint	136,000	25	7	7	0	0	2	82	3
Grand Rapids	156,000	3	3	0	0	0	10	15	1
Wisconsin:									
Kenosha	52,700	22	2	0	0	0	0	4	0
Milwaukee	517,000	69	22	16	6	5	5	31	17
Racine	69,400		2						
Superior	[1] 39,671	0	1	0	0	0	0	0	3
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	5	2	0	0	0	0	2	1
Minneapolis	434,000	74	20	13	0	1	2	11	8
St. Paul	248,000	20	14	3	0	1	0	56	8
Iowa:									
Davenport	[1] 52,469	1	1	0	0		0	0	
Des Moines	146,000	0	3	0	0		0	0	
Sioux City	78,000	8	1	0	0		20	32	
Waterloo	36,900	1	1	0	0		0	1	
Missouri:									
Kansas City	375,000	20	9	3	0	1	7	110	12
St. Joseph	78,400	5	2	1	0	0	1	6	3
St. Louis	830,000	23	51	37	0	0	40	22	
North Dakota:									
Fargo	[1] 26,403	12	0	0	0	1	0	8	1
Grand Forks	[1] 14,811	0	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	2	0	0	0		1	0	
Sioux Falls	[1] 30,127	0	0	0	0		0	0	
Nebraska:									
Lincoln	62,000	15	2	0	0	0	0	12	0
Omaha	216,000	16	5	5	0	0	0	1	7
Kansas:									
Topeka	56,500	22	2	4	1	1	0	1	3
Wichita	92,500	2	4	1	0	0	1	2	5

[1] Estimated, July 1, 1925.

City reports for week ended January 28, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	2	3	5	0	0	0	8	1
Maryland:									
Baltimore	808,000	171	40	14	22	1	302	18	35
Cumberland	[1] 33,741	1	1	0	0	0	0	0	0
Frederick	[1] 12,035	2	1	0	0	0	0	0	1
District of Columbia:									
Washington	528,000	33	22	34	9	3	20	0	19
Virginia:									
Lynchburg	30,500	9	2	3	0	0	0	0	3
Norfolk	174,000	28	2	5	0	0	12	0	6
Richmond	189,000	8	5	7	0	0	43	0	6
Roanoke	61,900	7	2	1	0	0	6	1	4
West Virginia:									
Charleston	50,700	0	1	3	0	0	0	0	2
Wheeling	[1] 56,208	4	1	0	0	0	3	0	4
North Carolina:									
Raleigh	[1] 30,371	10	1	0	0	0	21	0	4
Wilmington	37,700	7	0	0	0	0	62	0	2
Winston-Salem	71,800	0	0	1	0	0	75	14	1
South Carolina:									
Charleston	74,100	0	0	2	46	0	2	0	7
Columbia	41,800	8	1	1	0	1	150	18	3
Greenville	[1] 27,311		0						
Georgia:									
Atlanta	(2)	6	3	5	73	1	10	10	12
Brunswick	[1] 16,809	0	0	0	0	0	6	4	1
Savannah	94,900	4	1	0	12	0	68	3	6
Florida:									
Miami	[1] 69,754	6		2	0	0	0	1	1
St. Petersburg	[1] 26,847		0			0			0
Tampa	102,000	14	1	2	0	0	0	0	1
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	2	1	0	0	0	14	0	3
Louisville	311,000		7						
Tennessee:									
Memphis	177,000	8	5	6	0	0	195	5	8
Nashville	137,000	2	1	0	0	8	2	2	4
Alabama:									
Birmingham	211,000	15	3	3	40	5	11	2	7
Mobile	66,800	1	0	2	0	0	0	0	0
Montgomery	47,000	2	0	1	0		1	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643		1						
Little Rock	75,900	0	1	3	0	0	65	0	4
Louisiana:									
New Orleans	419,000	4	13	13	17	12	2	0	18
Shreveport	59,500	7	2	1	0	0	23	0	4
Oklahoma:									
Oklahoma City	(2)	3	1	2	0	0	10	0	6
Tulsa	133,000	2	2	2	0		0	6	
Texas:									
Dallas	203,000		7	7	2	2	2		9
Fort Worth	159,000	19	3	11	1	0	1	1	4
Galveston	49,100	0	1	0	0	0	0	0	3
Houston	[1] 164,954	7	6	12	1	1	4	1	13
San Antonio	205,000	1	2	5	0	4	28	3	14
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	1	0	0	0	0	0	0
Great Falls	[1] 29,883	1	1	1	0	1	0	0	0
Helena	[1] 12,037	1	0	0	0	0	0	0	1
Missoula	[1] 12,668	1	0	0	0	0	0	0	0

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

City reports for week ended January 28, 1928—Continued

Division, State, and city	Population, July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MOUNTAIN—contd.									
Idaho:									
Boise	[1] 23,042	3	0	0	0	0	0	1	0
Colorado:									
Denver	285,000	25	12	8	-------	5	9	77	14
Pueblo	43,900	13	2	2	0	1	0	0	3
New Mexico:									
Albuquerque	[1] 21,000	5	0	0	0	0	28	3	0
Utah:									
Salt Lake City	133,000	27	3	3	0	2	1	1	2
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(2)	24	6	2	0	-------	121	13	-------
Spokane	109,000	22	4	0	0	-------	0	0	-------
Tacoma	106,000	7	3	1	0	1	8	6	3
Oregon:									
Portland	[1] 282,383	31	10	4	1	0	5	4	7
California:									
Los Angeles	(2)	54	46	48	29	4	9	17	32
Sacramento	73,400	27	3	0	0	0	7	0	1
San Francisco	567,000	119	22	12	1	1	25	28	7

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	3	8	0	0	0	0	0	0	0	8	22
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	12
Manchester	3	3	0	0	0	1	0	0	0	0	12
Vermont:											
Barre	0	1	0	0	0	0	0	0	0	0	3
Burlington	1	2	0	0	0	0	0	0	0	4	11
Massachusetts:											
Boston	85	65	0	0	0	20	1	4	0	74	210
Fall River	3	6	0	0	0	2	0	3	1	1	26
Springfield	9	19	0	0	0	2	0	0	0	9	34
Worcester	12	3	0	0	0	5	0	0	0	10	52
Rhode Island:											
Pawtucket	1	9	0	0	0	0	0	2	0	0	22
Providence	9	35	0	0	0	2	0	0	0	1	66
Connecticut:											
Bridgeport	12	5	0	0	0	3	0	0	0	1	31
Hartford	8	11	0	0	0	1	0	0	1	4	42
New Haven	11	0	0	0	0	3	0	0	0	21	39
MIDDLE ATLANTIC											
New York:											
Buffalo	26	58	0	0	0	3	1	0	0	27	152
New York	263	337	0	0	0	103	10	5	1	224	1,523
Rochester	13	5	0	1	0	5	0	0	0	3	82
Syracuse	15	13	0	0	0	0	1	0	0	21	47
New Jersey:											
Camden	6	5	0	0	0	1	0	0	0	0	27
Newark	28	30	0	0	0	7	0	0	0	39	118
Trenton	6	6	0	0	0	1	0	0	0	3	33

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

City reports for week ended January 28, 1928—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
MIDDLE ATLANTIC—continued											
Pennsylvania:											
Philadelphia	96	82	0	0	0	25	3	2	0	73	525
Pittsburgh	45	22	0	0	0	5	0	4	0	20	207
Reading	1	34	0	0	0	2	1	0	0	0	19
Scranton	------	6	------	0	------	------	------	0	------	9	------
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	21	17	1	0	0	9	0	0	0	2	110
Cleveland	44	46	1	0	0	18	1	1	1	64	232
Columbus	12	------	1	------	------	------	1	------	------	------	------
Toledo	15	14	1	1	0	2	1	0	0	7	65
Indiana:											
Fort Wayne	7	2	0	0	0	1	0	1	0	1	25
Indianapolis	9	24	12	3	0	1	0	0	0	5	106
South Bend	3	0	0	0	0	0	0	0	0	0	9
Terre Haute	4	1	1	3	0	0	0	0	0	0	14
Illinois:											
Chicago	144	145	2	3	0	52	3	5	0	148	21
Springfield	2	15	0	0	0	2	1	1	0	0	25
Michigan:											
Detroit	105	106	3	2	0	34	1	0	1	75	298
Flint	9	15	1	2	0	1	0	0	0	4	26
Grand Rapids	13	8	0	0	0	0	0	0	0	8	18
Wisconsin:											
Kenosha	1	9	0	2	0	0	0	0	0	2	3
Milwaukee	30	51	2	4	0	5	1	0	0	25	102
Racine	7	------	0	------	------	------	0	------	------	------	------
Superior	4	0	2	0	0	1	0	0	0	0	13
WEST NORTH CENTRAL											
Minnesota:											
Duluth	10	3	1	0	0	2	1	1	0	3	15
Minneapolis	62	23	6	1	0	3	1	2	0	1	84
St. Paul	36	15	7	1	0	1	1	0	0	11	49
Iowa:											
Davenport	1	6	2	3	------	------	0	0	------	0	------
Des Moines	7	16	2	21	------	------	0	0	------	0	------
Sioux City	2	2	2	0	------	------	0	1	------	0	------
Waterloo	2	7	0	0	------	------	0	0	------	0	------
Missouri:											
Kansas City	14	22	3	4	0	7	0	0	0	4	101
St. Joseph	3	1	1	25	0	2	0	0	0	0	22
St. Louis	51	39	3	0	0	9	1	0	0	30	245
North Dakota:											
Fargo	2	4	0	0	0	1	0	0	0	5	10
Grand Forks	0	2	1	0	------	------	0	0	------	0	------
South Dakota:											
Aberdeen	1	0	0	0	------	------	0	0	------	0	------
Sioux Falls	3	2	0	0	------	------	0	0	------	0	10
Nebraska:											
Lincoln	4	3	0	12	0	0	0	1	0	12	18
Omaha	4	15	10	1	0	1	0	0	0	1	48
Kansas:											
Topeka	2	3	0	5	0	0	0	0	0	11	21
Wichita	6	6	0	25	0	0	0	0	0	0	29
SOUTH ATLANTIC											
Delaware:											
Wilmington	7	1	0	0	0	0	0	0	0	1	32
Maryland:											
Baltimore	47	33	0	2	0	12	2	0	1	25	236
Cumberland	2	0	0	0	0	0	0	0	0	0	3
Frederick	1	1	0	0	0	0	0	0	0	0	7
District of Columbia:											
Washington	28	39	1	0	0	12	1	2	1	11	147

City reports for week ended January 28, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
SOUTH ATLANTIC—continued											
Virginia:											
Lynchburg	0	0	0	0	0	0	0	0	0	4	8
Norfolk	2	14	0	0	0	1	1	0	0	0	
Richmond	5	7	0	0	0	1	0	0	0	0	57
Roanoke	1	5	0	0	0	1	0	0	0	2	16
West Virginia:											
Charleston	1	2	0	2	0	0	1	0	0	0	9
Wheeling	2	3	0	0	0	0	0	0	0	1	15
North Carolina:											
Raleigh	1	1	0	0	0	1	0	0	0	0	19
Wilmington	1	0	0	0	0	0	0	0	0	0	12
Winston-Salem	2	0	4	0	0	1	0	0	0	0	28
South Carolina:											
Charleston	0	1	1	0	0	2	0	0	0	0	26
Columbia	0	0	1	0	0	0	0	0	0	1	35
Greenville	0		0				0				
Georgia:											
Atlanta	4	5	4	0	0	2	0	0	0	1	67
Brunswick	0	0	0	0	0	0	0	0	0	0	3
Savannah	1	0	0	4	0	3	1	1	0	0	37
Florida:											
Miami		3		0	0	2		1	0	0	34
St. Petersburg	0		0		0	0	0		0		15
Tampa	0	2	0	0	0	2	2	1	0	0	27
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	2	0	1	0	1	0	0	0	1	18
Louisville	6		1				1				
Tennessee:											
Memphis	7	7	2	1	0	2	0	1	0	4	59
Nashville	3	0	0	0	0	2	0	1	0	1	51
Alabama:											
Birmingham	3	4	4	2	0	9	1	2	0	2	64
Mobile	0	3	1	0	0	3	0	0	0	0	27
Montgomery	0	0	1	0			0	0		2	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1		0				0				
Little Rock	1	2	0	2	0	9	0	0	0	0	
Louisiana:											
New Orleans	6	3	0	0	0	20	2	2	0	6	176
Shreveport	0	7	0	0	0	2	0	0	0	0	29
Oklahoma:											
Oklahoma City	2	2	2	0	0	1	0	0	0	0	26
Tulsa	1	4	1	4			0	0		1	
Texas:											
Dallas	4	9	2	1	0	6	1	4	0		55
Fort Worth	1	7	1	2	0	1	1	0	0	0	34
Galveston	0	0	0	0	0	2	0	4	0	0	17
Houston	2	5	2	2	0	9	0	0	0	0	74
San Antonio	1	5	0	0	0	14	0	0	0	0	70
MOUNTAIN											
Montana:											
Billings	1	5	0	0	0	0	0	0	0	1	8
Great Falls	3	4	1	6	0	0	0	0	0	0	6
Helena	1	2	0	2	0	1	0	0	0	0	4
Missoula	1	1	0	0	0	0	0	0	0	0	2
Idaho:											
Boise	1	0	1	0	0	0	0	0	0	0	6
Colorado:											
Denver	13	9	2	1	0	7	1	0	0	10	102
Pueblo	2	6	0	1	0	0	0	0	0	2	15

City reports for week ended January 28, 1928—**Continued**

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
MOUNTAIN—con.											
New Mexico:											
Albuquerque	2	5	0	0	0	7	0	0	0	0	16
Utah:											
Salt Lake City	4	7	2	4	0	1	0	0	0	6	30
Nevada:											
Reno	0	0	1	1	0	0	0	0	0	0	1
PACIFIC											
Washington:											
Seattle	13	10	4	1			0	0		0	
Spokane	4	25	5	15			0	0		0	
Tacoma	3	5	4	0	0	0	1	0	0	0	27
Oregon:											
Portland	7	6	8	22	0	9	1	0	0	2	92
California:											
Los Angeles	32	30	6	5	0	25	2	0	0	12	294
Sacramento	2	3	1	0	0	4	0	0	0	0	32
San Francisco	16	43	3	2	0	11	1	0	0	5	178

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	0	1	0	0	0	0	2	1
Springfield	1	0	0	0	0	0	0	0	0
Rhode Island:									
Providence	0	0	1	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	6	2	4	0	0	0	1	3	0
Pennsylvania:									
Pittsburgh [1]	0	1	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cleveland	3	0	0	1	0	0	0	0	0
Toledo	1	0	0	0	0	0	0	0	0
Indiana:									
Fort Wayne	0	0	0	0	0	0	0	1	1
Indianapolis	1	2	0	0	0	0	0	0	0
Illinois:									
Chicago	1	1	0	0	0	0	1	0	0
Michigan:									
Detroit	0	0	0	0	0	0	0	1	0
Flint	0	0	0	0	0	0	0	1	0
Grand Rapids	0	0	0	0	0	0	0	1	0
Wisconsin:									
Milwaukee	4	1	0	0	0	0	0	0	0
Superior	0	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	2	0	0	0	0	0	0	0	0
Minneapolis	1	0	0	0	0	0	0	0	0
Iowa:									
Waterloo	1		0		0		0	0	
Missouri:									
St. Louis	3	2	0	0	0	0	0	0	0
North Dakota:									
Fargo	0	0	2	1	0	0	0	1	0

[1] Rabies (human): 1 death at Pittsburgh, Pa.

City reports for week ended January 28, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	1	1	0	0	0	0	0
Frederick	0	1	0	0	0	0	0	0	0
Virginia:									
Norfolk	0	0	1	0	0	0	0	0	0
West Virginia:									
Charleston	0	0	0	0	0	0	0	1	0
Georgia:									
Atlanta	0	0	0	0	0	0	0	0	1
Brunswick	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	0	0	0	1	0	0	0	0
Nashville	0	2	0	0	1	0	0	0	0
Alabama:									
Birmingham	1	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	1	0	1	0	2	1	0	0	0
Texas:									
Fort Worth	0	0	0	0	0	1	0	0	0
Houston [2]	1	1	0	0	0	0	0	1	0
San Antonio	0	0	0	0	0	1	0	0	0
MOUNTAIN									
Montana:									
Missoula	1	0	0	0	0	0	0	0	0
Colorado:									
Denver	3	1	0	0	0	0	0	0	1
Utah:									
Salt Lake City	1	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	0	-------	0	-------	0	-------	0	1	-------
California:									
Los Angeles	0	1	0	0	0	0	0	2	0
San Francisco	1	0	0	0	1	1	0	0	0

[2] Typhus fever: 1 case at Houston, Tex.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended January 28, 1928, compared with those for a like period ended January 29, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1927 and 1928, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,050,000 in 1927 and 31,657,000 in 1928. The 95 cities reporting deaths had nearly 30,370,000 estimated population in 1927 and nearly 30,961,000 in 1928. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, December 25, 1927, to January 28, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926–27 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
101 cities	176	185	198	[2] 169	186	200	175	193	177	[3] 194
New England	158	165	158	149	174	200	151	168	163	172
Middle Atlantic	171	221	182	202	176	253	191	252	194	251
East North Central	193	200	223	176	189	220	170	192	175	[4] 189
West North Central	165	125	188	115	158	111	146	138	127	131
South Atlantic	173	129	222	[5] 154	215	142	161	146	198	[6] 147
East South Central	186	112	137	90	248	50	152	105	101	[7] 87
West South Central	223	264	252	[8] 246	244	204	170	152	208	[8] 168
Mountain	137	63	126	71	117	115	117	168	197	124
Pacific	155	141	230	123	193	143	232	125	167	161

MEASLES CASE RATES

101 cities	231	322	384	[2] 518	339	566	451	619	425	[3] 575
New England	184	708	253	917	195	1,021	549	1,248	323	1,078
Middle Atlantic	22	331	31	466	38	500	49	478	46	483
East North Central	294	160	427	265	406	300	545	328	536	[4] 384
West North Central	61	46	259	134	192	109	277	259	297	138
South Atlantic	179	832	204	[5] 1,461	202	1,496	301	1,675	256	[6] 1,381
East South Central	78	397	106	1,566	96	1,521	203	1,387	188	[7] 1,021
West South Central	18	113	186	[8] 197	302	268	447	560	376	[8] 509
Mountain	3,545	36	5,227	62	3,434	106	5,074	97	4,447	88
Pacific	697	283	1,517	383	1,478	526	1,342	531	1,504	434

SCARLET FEVER CASE RATES

101 cities	267	210	318	[2] 208	366	258	384	269	386	[3] 278
New England	356	346	491	340	479	398	537	508	539	372
Middle Atlantic	235	200	285	196	328	266	368	268	378	288
East North Central	245	257	288	234	345	285	336	286	347	[4] 301
West North Central	385	193	449	203	556	261	517	224	487	273
South Atlantic	238	149	231	[5] 152	258	168	280	207	253	[6] 202
East South Central	176	117	233	190	213	140	335	190	319	[7] 116
West South Central	159	126	153	[8] 103	141	124	194	88	112	[8] 127
Mountain	893	234	950	195	1,112	301	1,345	265	1,605	301
Pacific	252	126	340	184	376	229	319	240	326	296

SMALLPOX CASE RATES

101 cities	14	15	22	[2] 17	22	23	20	22	26	[3] 23
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	1	0	0	0	1	0	1	0	0	0
East North Central	7	12	32	9	21	7	17	9	17	[4] 13
West North Central	40	79	57	105	69	146	59	121	79	121
South Atlantic	41	4	27	[5] 12	51	26	34	14	60	[6] 14
East South Central	47	10	41	5	86	15	25	55	86	[7] 29
West South Central	21	4	41	[8] 16	25	28	62	4	41	[8] 21
Mountain	9	144	0	106	0	142	0	106	9	133
Pacific	21	29	60	26	37	31	63	64	71	59

[1] The figures given in this table are rates per 100,000 population annual basis and not the number of cases reported. Populations used are estimated as of July 1, 1926, 1927, and 1928, respectively.
[2] Atlanta, Ga., and Fort Smith, Ark., not included.
[3] Columbus, Ohio, Racine, Wis., Greenville, S. C., Louisville, Ky., and Fort Smith, Ark., not included.
[4] Columbus, Ohio, and Racine, Wis., not included.
[5] Atlanta, Ga., not included.
[6] Greenville, S. C., not included.
[7] Louisville, Ky., not included.
[8] Fort Smith, Ark., not included.

Summary of weekly reports from cities, December 25, 1927, to January 28, 1928—Annual rates per 100,000 population, compared with rates for the corresponding period of 1926-27—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
101 cities	12	7	8	[2] 5	9	8	7	6	7	[3] 8
New England	24	14	9	7	21	14	2	9	5	21
Middle Atlantic	7	4	6	3	8	5	5	3	4	5
East North Central	5	5	5	3	1	3	6	6	2	[4] 5
West North Central	4	10	8	2	6	8	4	2	8	8
South Atlantic	34	13	7	15	16	2	7	5	18	[6] 7
East South Central	21	10	25	20	15	55	10	30	35	[7] 29
West South Central	17	21	25	[8] 0	17	20	4	12	0	[8] 41
Mountain	27	18	9	9	9	0	27	9	18	0
Pacific	16	0	8	5	21	10	21	8	21	0

INFLUENZA DEATH RATES

	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
95 cities	17	19	20	[5] 19	21	24	21	24	25	[9] 19
New England	12	5	16	16	14	7	5	18	9	7
Middle Atlantic	21	14	18	13	20	21	20	19	22	16
East North Central	15	10	17	10	16	13	25	17	21	[4] 12
West North Central	8	8	14	4	10	14	4	18	4	10
South Atlantic	17	22	16	[5] 21	23	37	20	26	49	[6] 11
East South Central	26	56	48	89	37	78	16	105	32	[7] 101
West South Central	13	82	42	82	42	66	42	66	72	78
Mountain	46	72	63	53	99	62	54	71	72	80
Pacific	0	31	10	24	14	37	31	17	14	20

PNEUMONIA DEATH RATES

	Jan. 1, 1927	Dec. 31, 1927	Jan. 8, 1927	Jan. 7, 1928	Jan. 15, 1927	Jan. 14, 1928	Jan. 22, 1927	Jan. 21, 1928	Jan. 29, 1927	Jan. 28, 1928
95 cities	164	157	195	[5] 170	179	191	183	179	158	[9] 160
New England	172	146	181	103	191	179	207	156	158	126
Middle Atlantic	180	158	208	186	204	214	197	193	174	183
East North Central	134	135	169	140	152	158	138	137	132	[4] 123
West North Central	118	108	116	124	124	112	116	137	126	98
South Atlantic	187	188	229	[5] 231	189	252	278	231	189	[6] 209
East South Central	191	183	213	235	207	225	255	251	213	[7] 171
West South Central	150	310	238	238	178	287	195	308	200	267
Mountain	201	198	368	195	197	168	215	186	170	177
Pacific	198	138	210	176	169	142	134	142	107	145

[2] Atlanta, Ga., and Fort Smith, Ark., not included.
[3] Columbus, Ohio, Racine, Wis., Greenville, S. C., Louisville, Ky., and Fort Smith, Ark., not included.
[4] Columbus, Ohio, and Racine, Wis., not included.
[5] Atlanta, Ga., not included.
[6] Greenville, S. C., not included.
[7] Louisville, Ky., not included.
[8] Fort Smith, Ark., not included.
[9] Columbus, Ohio, Racine, Wis., Greenville, S. C., and Louisville, Ky., not included.

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

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

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended January 14, 1928.—The following report for the week ended January 14, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva:

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

PLAGUE

Egypt.—Suez.
Aden Protectorate.—Aden.
India.—Bombay, Rangoon, Moulmein.
Ceylon.—Colombo.
Dutch East Indies.—Makassar.

CHOLERA

India.—Bombay, Calcutta, Rangoon.
Straits Settlements.—Singapore.

CHOLERA—continued

Siam.—Bangkok.
French Indo-China.—Saigon-Cholon.

SMALLPOX

India.—Bombay, Negapatan, Madras, Calcutta, Rangoon, Moulmein.
French Indo-China.—Saigon-Cholon.
Dutch East Indies.—Belawan-Deli.
Sarawak.—Kuching.
China.—Hong Kong.

Returns for the week ended January 14 were not received from the following ports:

India.—Tuticorin, Vizagapatam, Bassein.
Dutch East Indies.—Pontianak.
China.—Canton.
Union of Socialist Soviet Republics.—Vladivostok.

ARGENTINA

Buenos Aires—Plague.—A death from plague was reported at Buenos Aires, Argentina, February 9, 1928. Unconfirmed newspaper reports announced four other deaths from plague in Buenos Aires.

Rosario—Plague—January 15–25, 1928.—According to information dated February 6, 1928, four cases of plague were reported at Rosario, Argentina, during the period January 15 to 25, 1928. The president of the Department of Hygiene of Argentina states that the work of destroying rats by poison, traps, and other measures is going on continuously at Rosario, that ships are being protected against rats, and that the spread of the disease is not anticipated. Similar measures are being taken at other ports in Argentina.

BAHAMA ISLANDS

Measles—Typhoid fever—March 1, 1927–January 28, 1928.—Information received under date of January 28, 1928, shows the occurrence of 86 cases of measles and 112 cases of typhoid fever with six deaths in the Bahama Islands during the period March 1, 1927, to January 28, 1928.

BOLIVIA

Water supply systems—Municipalities.—Information received under date of July 29, 1927, shows that the cities of Cochabamba, La Paz, Oruro, Potosi, Sucre, Santa Cruz, and Trinidad, Republic of Bolivia, have municipal water-supply systems, but that no system of filtration or purification of water exists in any of these localities. La Paz, Oruro, and Cochabamba are stated to have concrete sewers which are separate from the storm water drainage system. The other cities have only old subterranean canals of rubble masonry. Oruro receives its supply from the springs of Calacala; Cochabamba from Artesian wells; Potosi from reservoirs constructed in the Kari-kari mountains; Sucre from the waters of the Cajamarca River. It was stated that the water supply of La Paz was not free from mineral and organic impurities. The present water supply of La Paz was stated to be little in excess of 12 liters per day per capita, whereas it should be about 1,000 liters per day per capita.

BRAZIL

Pernambuco, Natal, Parahyba, Fortaleza—Health conditions—Vital Statistics, 1922–1926.—Health conditions in the cities named are said to be generally good, but the rural districts and smaller interior cities are more backward.

Yellow fever is said not to be a matter of great concern to Brazilians and, as at present controlled, not a grave menace to foreigners.

In 1925 and 1926 an epidemic of smallpox occurred in Pernambuco which affected neighboring States.

In 1926 two cases of bubonic plague occurred in Triumpho, Pernambuco, but the disease did not spread. A plague prevention post was established at Triumpho in 1927.

Some cases of typhoid fever and numerous cases of influenza are usually present in the State of Pernambuco. "Grippe intestinal" and dysentery are the diseases most often reported in the States of Rio Grande do Norte, Parahyba do Norte, and Ceara. Tuberculosis and malaria are said to be the chief causes of death in the States named.

Among the middle and upper classes hygienic and sanitary conditions are said to be good. The houses, as a rule, are kept clean. The storing of water in earthenware receptacles is a common practice, and flies are numerous.

American residents in this part of Brazil ordinarily observe sanitary precautions, drink boiled water or mineral water, avoid the use of raw vegetables, and take frequent vacations to minimize the effects of the tropical climate.

The following table gives vital statistics for the cities named for the years 1922 to 1926, inclusive:

CITY OF RECIFE (PERNAMBUCO)

	1922	1923	1924	1925	1926
Population	270,000	320,000	330,000	355,871	361,553
Births (living infants)	2,939	2,678	3,051	9,897	9,955
Births (stillborn)	915	923	916	938	913
Deaths	7,565	7,936	7,981	7,388	7,866
Death rate per thousand	28.0	25.3	24.4	20.7	24.4
Deaths under 2 years of age	1,953	2,069	1,977	1,829	1,973

CITY OF NATAL (RIO GRANDE DO NORTE)

	1922	1923	1924	1925	1926
Population	35,000	35,000	35,000	35,000	35,000
Births (living infants)	363	373	422	596	995
Births (stillborn)	84	110	82	92	98
Deaths	970	983	1,029	768	863
Death rate per thousand	27.7	28.0	29.4	21.9	24.6
Deaths under 2 years of age	502	482	511	345	415

CITY OF PARAHYBA (PARAHYBA DO NORTE)

	1922	1923	1924	1925	1926
Population	52,000	52,000	52,000	52,000	52,000
Births (living infants)	748	542	546	428	239
Births (stillborn)	89	106	124	138	127
Deaths	1,289	1,417	1,437	1,686	1,213
Death rate per thousand	24.7	27.2	27.6	32.4	23.3
Marriages	250	264	239	174	219
Infant mortality:					
Infants less than 1 year	550	449	530	485	490
Infants 1 to 2 years	95	117	47	118	61
Deaths:					
Cancer	8	9	6	10	6
Diphtheria, croup	6	Nil.	1	4	3
Dysentery	9	2	8	11	12
Grippe	4	3	4	6	71
Malaria	129	154	206	130	115
Smallpox	Nil.	Nil.	Nil.	*511*	Nil
Tuberculosis	194	203	234	129	162
Typhoid fever	6	11	8	4	13
Yellow fever	Nil.	Nil.	Nil.	2	17

CITY OF FORTALEZA (CEARA)

	1922	1923	1924	1925	1926
Population	90,000	90,000	90,000	95,000	100,000
Births (living infants)	1,461	818	858	863	894
Births (stillborn)	62	55	49	76	79
Deaths	2,318	2,300	2,795	2,076	2,639
Death rate per thousand	25.75	25.55	31.05	21.85	26.39
Deaths under 2 years of age	865	853	1,162	759	1,104

Rio de' Janeiro—Plague.—Two cases of plague were reported in Rio de Janeiro, Brazil, recently. The first case occurred January 17, 1928. A plague-infected rat was reported January 16, 1928, in Rio de Janeiro.

CANADA

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

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever			1	1		1		3
Influenza	4			12	2	1		19
Lethargic encephalitis					1			1
Smallpox				77	1	15	19	112
Typhoid fever	4	7	19	11	1		3	45

Quebec—Communicable diseases—Week ended January 28, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended January 28, 1928, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Scarlet fever	94
Chicken pox	32	Smallpox	18
Diphtheria	64	Tuberculosis	32
German measles	2	Typhoid fever	19
Influenza	1	Whooping cough	33
Measles	86		

COSTA RICA

Antituberculosis and venereal disease work.—Information received under date of October 28, 1927, shows that a campaign of cure and prevention of tuberculosis and venereal diseases has been ordered to be instituted in the principal cities of Costa Rica. The campaign against tuberculosis is to be carried out mainly through visiting nurses and dispensaries are to be instituted for the free treatment of venereal diseases in the larger cities and free service by municipal doctors is to be provided in the smaller communities.

Campaign for extermination of rats—Limon and Puntarenas.—Information under date of December 16, 1927, shows that a campaign of rat extermination has been ordered into effect at Limon and Puntarenas, Costa Rico, as the result of action taken at the Pan American sanitary conference held during the autumn of 1927 at Lima, Peru.

EGYPT

Plague—December 29, 1927–January 8, 1928—Alexandria.—A fatal case of plague was reported December 29, 1927. The case occurred in an Egyptian workman employed in a cotton depot, who was found dead in his lodging, 850 meters from the port. *Suez.*—On January 8, 1928, a fatal case occurred in a native found dead in his lodging. The focus of this case was stated to be in the vicinity of a Government primary school 3½ kilometers from the port.

Summary and comparison with year 1926.—During the year ended December 31, 1927, 79 cases of plague were reported in Egypt, as compared with 150 cases reported during the corresponding period of the year 1926.

GUATEMALA

Sanitation along railway lines.—According to information received under date of November 29, 1927, sanitary work in towns on the railway connecting Guatemala City with Puerto Barrios, Guatemala, was done in October, 1927. The measures taken included oiling of stagnant water along the railway lines.

HONDURAS

Tegucigalpa—Malaria.—Cases of malaria apparently of local origin were reported at Tegucigalpa, Honduras, during the month of September, 1927. A survey showed mosquitoes breeding in two localities along the Choluteca River banks within the city limits. It was stated that measures were being applied to correct these conditions.

JAPAN

Dysentery—Tokyo, city and prefecture—November 27–December 31, 1927.—During the period November 27 to December 31, 1927, dysentery was reported in Tokyo, Japan, as follows: Tokyo City, cases, 110; deaths, 50; Tokyo prefecture, outside of the city, cases, 144; deaths, 70.

LATVIA

Communicable diseases—November, 1927.—During the month of November, 1927, communicable diseases were reported in the Republic of Latvia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	6	Puerperal fever	5
Diphtheria	28	Relapsing fever	2
Erysipelas	8	Scarlet fever	135
Influenza	22	Tetanus	1
Malaria	3	Trachoma	16
Measles	217	Typhoid fever	87
Mumps	7	Whooping cough	15

Population, 1,950,000.

MEXICO

Manzanillo—Death from smallpox—General vaccination ordered—January 19, 1928.—Information received under date of January 19, 1928, shows that, following the occurrence of a death from smallpox during the week ended January 15, 1928, at Manzanillo, Mexico, the port medical authority has directed all local physicians at Manzanillo to assign one hour daily to the free vaccination of residents of Manzanillo, who are required to present certificates of vaccination to the medical authority.

PANAMA

Aguadulce, Province of Cocle—Antimalaria measures.—Information dated November 12, 1927, shows antimalaria work being conducted at Aguadulce, Republic of Panama. The work undertaken included control of water supply and sewerage and drainage systems.

PERU

La Oroya—Influenza and pneumonia mortality—October-December, 1927.—During the three months ended December 31, 1927, epidemic influenza in mild form was reported present at La Oroya, Peru. Many deaths from pneumonia occurred. Smallpox was said to be prevalent.

UNION OF SOUTH AFRICA

Typhus fever—December 18-24, 1927.—During the week ended December 24, 1927, fresh outbreaks of typhus fever were reported in the Cape Province, in two districts and five localities, and in Natal in one district.

During the same period, two cases of typhus fever were reported at Durban, Natal, in a European and an Asiatic. The cases were stated to be sporadic.

YUGOSLAVIA

Communicable diseases—December, 1927.—During the month of December, 1927, communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	36	1	Poliomyelitis	2	
Cerebrospinal meningitis	9	4	Scarlet fever	1,691	244
Diphtheria	303	51	Tetanus	11	7
Dysentery	49	5	Typhoid fever	466	60
Leprosy		1	Typhus fever	1	
Measles	3,301	18			

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

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

CHOLERA

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

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7
China:																
Amoy	C	2	28	72	16											
	D		7	3												
Canton	C	8	31	36	14	5	1	6			1					
	D	5	16	25	14	5	1	5			1					
Foochow	C	P	P	P	P											
Hong Kong	C	2	P	1	P											
	D	1														
Shanghai—(settlement and concession)																
Foreigners only	C		1	6	3											
Including natives	D		20	74	7											
Swatow	C	72	42	P	P	P	P									
	D	1		P	P	P	P									
Tientsin	C	P	P	15	2	P	P									
Dutch East Indies: Java—Batavia	C						1	2	25	2	1					
	D						1	2	15	2	1					
India	C	46,137	45,163	31,390	20,160	5,303	4,845	5,987	6,912							
	D	24,081	22,051	15,895	10,371	2,867	2,641	3,350	4,005							
Bombay	C	75	42	3				2								
	D	35	30	2				2								
Calcutta	C	95	87	76	101	28	35	65	71	156	119	87	66			
	D	48	40	39	64	22	25	42	49	106	77	55	43	48	34	27
Madras	C	424	547	59	14			6	7			1				
	D	204	278	48	8			3	4	1		1				
Rangoon	C	2	1	2	6		1		1	3	1	2	2	1		
	D	2	1	2	5	1		3	4	2	1	2	1	1	1	
Tuticorin	C				1						6		2			
	D				1	7	5	10	15		6	6	2			
India (French):																
Karikal	C	56	18	1			1									
	D	45	12	1			1									
Pondicherry	C	37	12	15			1				5					
	D	24	11	15			1				5					

Indo-China: Saigon	C			1	1											2
	D															1
Iraq:[1]																
Amarah	C					4	8	3	2		1	1				
	D					6	8	3	2		1	1				
Baghdad	C						10	13	8	3	38	6		3		
	D						5	2	2	3	38	6				
Diwaniyah	C					4	3	1	2							
	D					2			1							
Diyala	C										1					
	D										1					
Dulaim	C										1					
Hillah	C					7	3	5	53		7					
	D					6	2	1	29		4					
Kerbala	C					1	4	2	2							
	D					1	5	2	2							
Kut	C					9	1	5								
	D					4	1	3								
Montafiq	C							4	14		8					
	D							2	10		8					
Ramadi	C					19	18	27	21							
	D					10	23	14	16		1					
Japan: Yokohoma	C	1														
	D	1														
Philippine Islands: Manila	C	1	1													
Siam	C	81	77	40	18	14	23	43	30	19	29	18	32			
	D	59	53	24	11	10	15	25	26	11	19	13	21			
Bangkok	C	6	2	3	5		1		3		1	1	1	2	3	7
	D	1	1	1	3		1		1		1		1	2	1	3
Straits Settlements: Singapore	C					1		4	2	1	2		2	3	12	3
	D					1		4		2			2	1	3	5
On vessel:																
S. S. Adrastus: At Yokohoma, Japan	C		1													
	D		1													
S. S. Tabaristan: At Basra, Iraq	C				1											

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927		
						1-10	11-20	21-30	1-10	11-20	21-31
Indo-China (French):											
Annam	C	911	1,628	640	226	13	75	38	16	2	
Cambodia	C	87	89	75	180	56	1	28	21	12	39
Cochin-China	C	257	68	144	178	21	27	52	17	38	58
Laos	C	20	100	36	67	10					
Tonkin	C	1,093	189	24	1			1			2

[1] From July 24 to Oct. 22, 1927, 926 cases and 677 deaths were reported in Iraq. Of these, 166 cases and 126 deaths occurred in Amarah; 417 cases and 337 deaths in Basra; 81 cases and 47 deaths in Diwaniyah; 19 cases and 12 deaths in Hillah; 34 cases and 21 deaths in Kerbala; 8 cases and 6 deaths in Kut; and 185 cases and 118 deaths in Montafiq.

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

PLAGUE

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

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended: Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21
Algeria: Oran	C		4	1			1		1									
	D		3	1														
Arabia: Aden	C																24	13
	D																9	8
Argentina:																		
Bahia Blanca District	C									1	1	1						
Buenos Aires [1]	D																	
Cordoba Province	C		2		P	P	P			10				1	1			
Entre Rios	C		5															
Firmat	C												1					
Quilino	C									1	1	1						
Rosario [2]	C									1	1	1	1	2	3			
Ucacha	C												1					
Azores: St. Michaels Island	C	2	2	2	3	1		1	1	1	1	1		1		1		
	D			1	1							1						
Brazil: Rio de Janeiro	D																	2
British East Africa:																		
Tanganyiki	C	P	P		P	P	P											
Uganda	C	528	456	226	99													
	D	413	345	158	88													
Canary Islands:																		
Las Palmas	C				9					1			2			2		
Santa Cruz	C																	1
Ceylon; Colombo	C		1	3	1					1	1					1		
	D			3												1		
China:																		
Amoy	C	P																
Tungliao	D				200													
Tientsin	C		2															
Dutch East Indies:																		
Java	D			432	779	191	213											
Batavia and West Java	C	40	71	68	130	41	29	31	34	45	43	32						
	D	40	71	68	129	41	29	31	34	44	43	32						
Cheribon	C										1							
	D										1							

East Java and Madura	C	29	28	18	17	3	4	2	1	5	3							
	D	29	27	18	17	3	4	2	1	5	3							
Balik-Papan	C													1				
	D													1				
Makassar	C						2	2	2	1		1		2	1			
	D						2	2	2	1		1		2	1			
Egypt:																		
Alexandria	C		2	1						5	3	2	2	3	2			
	D									5	3			1	1			
Suez	C			1													1	
Greece:																		
Athens and Piræus	C		1	3	1										2	1		
	D				1										1			
Mitylene	C		1	5	1	1		2		1	1	1						
Patras	C		2	2	1		1											
	D				1		1											
Hawaii Territory: Hawaii	D		1															
India	C	404	1,391	2,710	3,246	812	1,015	856	919	1,193								
	D	241	836	1,428	1,792	495	551	485	554	668								
Bombay	C	14	14	7	4										1			
	D	13	11	5	3										1			
Calcutta	C			18														
	D			10														
Madras Presidency	C	255	620	465	583	149	83	152	86	190	158	220	223					
	D	115	321	230	298	63	54	80	85	111	61	108	79					
Rangoon	C	21	15	6	11	5	2		4	5	2	6	2	2				
	D	20	14	6	11	5	2		4	5	2	5	3	2	3			
Indo-China: Saigon	C			2					1									
Senegal:																		
Baol	C	41	23	72	95				P		P							
	D	22	13	33	40													
Cayor	C	126	227	463	176	32	8	8	P									
	D	74	166	233	88	20	4	4										
Dakar	C	67	46	20	1													
	D	41	32	12														
Louga	C			5	8													
	D			4														
M'Bour	C	28																
	D	23																
Rufisque	C	104	44	16														
	D	82	38	12														
Thies	C	7		9	1	1												
	D	3		7														
Tivaouane	C	43																
	D	29																
Siam	C				13					2			1					
	D				9		1			1			1					
Bangkok	C				2													
	D						1											

[1] A death from plague was reported at Buenos Aires, Argentina, Feb. 9, 1928. Unconfirmed newspaper reports announced 4 other deaths from plague.
[2] Four cases of plague Jan. 15–25, 1928, at Rosario, Argentina.

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

PLAGUE—Continued

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

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927 5	November, 1927 12	November, 1927 19	November, 1927 26	December, 1927 3	December, 1927 10	December, 1927 17	December, 1927 24	December, 1927 31	January, 1928 7	January, 1928 14	January, 1928 21
Straits Settlements: Singapore	C								1									
	D								1									
Turkey: Constantinople	C			1	1					1	1							
	D				1						1							
Union of South Africa:																		
Cape Province	C					2						2						
	D					2						1						
Orange Free State	C	4							1	8	P							
	D	4							1	6								
U. S. S. R.:																		
Chita District	C				1													
	D				1													
Northern Caucasus	C			14	1													
	D			10														
On vessel:																		
At La Plata, from Rosario, Argentina	C														1			
S. S. Aghios Gerasimos at Vigo, Spain	C								3									

Place		July	August	September	October	November	December
Algeria: Algiers	C				2		
British East Africa: Kenya	C	13	61	21	18	28	
Ecuador: Guayaquil	C	5	7	3	4	9	5
	D					3	2
Indo-China (French)	C			14	3	3	
Madagascar	C	46	98	170	166		
	D	43	80	154	155		
Ambositra Province	C	6	1		6		
	D	6	1		6		
Antisirabe Province	C		34	5	19		
	D		34	4	19		
Itasy Province	C	14	11	21	16		
	D	14	7	20	15		
Madagascar—Continued.							
Moramanga Province	C	5	4	3	24		
	D	5	4	3	20		
Tananarive Province	C	21	48	142	90		
	D	19	43	127	93		
Mauritius	C			1			
Peru	C	8	11	15	14		14
	D	7	6	6	5		4
Callao	D	3					
Lima	D				1	1	1
Syria: Beirut	C			1	1		

Indo-China (French), 3 cases, Dec. 11-20; Beirut, Syria, 1 case, Dec. 1-10.

SMALLPOX

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

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28
Algeria	C			382	683		294	218	149										
Algiers	C												3	3	4				
Oran	C	14	9	16	11		10	4	6	9	11	10	9	8	15	2			
Arabia: Aden	C	2							1		1		1						
	D	1																	
Brazil:																			
Para	C		1																
Rio de Janeiro	C	4	6	10		1													
	D	4	4	9		1													
British East Africa: Tanganyiki	D		21	8	P	P	P												
British South Africa:																			
Northern Rhodesia	C	48	55	39	164	150	10	22	3	57	15	125	55	2					
	D	2	1	2	11	40	23		1	18	7	28	9						
Southern Rhodesia	C								3				2	1					
Canada:																			
Alberta	C	42	17	17	23	6	2	1	1	7	3	3	6		3	3	5	1	19
Calgary	C	5	1																
Edmonton	C				1	1				6		1	1			3	2	1	
British Columbia: Vancouver	C			2								4		1	3	3	1		
Manitoba	C		13	9	7	3	14		2	1	3	1	2	2	2	2	5		1
Winnipeg	C	3	5	4	2				2			1	1	1			1	1	1
New Brunswick	C			2										1					
Nova Scotia	C			1	1														
Halifax	C				1														
Ontario	C	63	60	22	96	64	38	77	85	71	90	82	104		53	83	76	52	77
Hamilton	C										2								
Kingston	C								1					1					
Ottawa	C	37	27	40	67	47	17	51	19	10	19		34	18	9	20	23	20	16
Toronto	C	5		2	10	2	16	3	13		25	14		7		11	10	8	5
Windsor	C				9														
Quebec	C	12	1		8	7	3	12	3	8	5	3		14	3	10	17	7	18
Montreal	C							1						1		1	6	3	4
Quebec	C										2		2		2		3		
Riviere du Loup	C								3										
Saskatchewan	C	25	14	68	31	5	12	2	14	9	15	19	15	12	13	15	12	39	15
Moose Jaw	C		10	16	3								1		1	2	1	4	2
Regina	C	2	8		5			1											
Saskatoon	C											2			4				1

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

SMALLPOX—Continued

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

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28
Ceylon: Colombo	C		1								1								
	D		1																
China:																			
Antung	C	3																	
Canton	C			1															
	D			1															
Chefoo	C			1	P					P									
	D			1															
Foochow	C	P	P	P	P		P			P									
Hong Kong	C	3	1	2															
	D	3	1	2															
Manchuria—																			
Changchun	C	4								1									
Dairen	C				1		2						1						
	D				1														
Fushun	C	1		1				1											
Harbin	C	1											2		1				
Mukden	C	3			2	1													
Pensihu	C	1			1														
Tientsin	C	11		4	13	8				4	1	2	2	2					
Dutch East Indies:																			
Batavia and West Java	C	2	4		4			25											
	D							15											
East Java and Madura	C	8	4	22	8	1	3	5		4	3	2							
	D				1														
Egypt	C	4		3							4								
	D			1	1							1							
Cairo	C										1								
Great Britain:																			
England and Wales	C	721	568	508	473	199	219	258	226	233	366	230	212	255	247	275	398		
Birmingham	C		1		1														
Bradford	C					1	5	3	2	9	6	2	2	2	2	4	24		
Bristol	C				6	1			3	2	4	2							
Cardiff	C					1										1			
Leeds	C	2	5	3	7	1	1	1	2	3	3	6	4	4	6	1			

Liverpool	C																1		
Manchester	C				3		1	1	4	2	5	10	8		1	2	2		
Newcastle-upon-Tyne	C	1	1	2	6	2	6		1	28	18	5	4	2	13	2	5		
Sheffield	C	11	2	1	10	4			2	1	8			3		1	10		
Stoke-on-Trent	C		1													3	1		
Greece: Saloniki	D	1	2																
Guinea (French): Beyla	C	9																	
India	C	11,340	5,911	4,398	3,153	779	805	1,235	1,233										
	D	3,140	1,668	1,120	715	190	200	211	326										
Bombay	C	38	33	12	10	2			4				5		4				
	D	21	19	8	2	2			1				1						
Calcutta	C	93	27	22	5				5	4	3	11	7		17				
	D	70	25		6				2	2	1	6	2		17				
Madras	C	4	6	7	8	3		2	2	2	2	5	2	2					
	D	1		2		1		1		1	1	1		1					
Rangoon	C	37	14	9	17	4		1	1	5	2	1	6	36	28				
	D	11	3	2	3	1				1	1		2	5	13				
India (French):																			
Karikal	C	2	3	1	2		P												
	D	2	3	1	2														
Pondicherry	C	22	39	37	38														
	D	20	31	37	38														
Indo-China: Saigon	C	1	1	1									1		1				
Iraq:																			
Baghdad	C			1	7			5		1	5	7	12						
	D			1	4			4			5	4	5						
Basra	C	1	1	4	2				3		2	2			2				
	D	1	1	4	2				1		2	1			1				
Italy: Rome and vicinity	C	1		1															
Jamaica (outside Kingston) (alastrim)	C	15	6	9	9	7				1		1	1		2				
Kingston	C			3	2														
Japan: Nagasaki	C	17	2																
	D	5	1																
Mexico:																			
Acapulco	C			2				1											
	D			2				1											
Chihuahua	D															1			
Guadalajara	D									1			1						
Manzanillo	D																1		
Mexico City and surrounding territory	C									1	1	1	1						
Monterey	C	6																	
	D	4																	
San Luis Potosi	D	4	1																
Torreon	D		1		2														
Palestine: Jerusalem	C										1								
Paraguay	D	2																	
Persia: Teheran	D	2																	
Poland	C	7	2																
	D	2	1																

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

SMALLPOX—Continued

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

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14	21	28
Portugal:																			
Lisbon	C	4		3	8	1	2				1					4			
	D												1						
Oporto	C			1															
Siam	C	34	51	27	6				1		8		1						
	D	9	10	15									1						
Bangkok	C	5		3					1		1								
	D	1		1															
Spain:																			
Malaga	D								1	1									
Seville	C																1		
Valencia	C				1										1	1			
Straits Settlements: Singapore	C							1											
Sumatra: Medan	C		1										3						
	D												2						
Switzerland	C													2					
Tunisia: Tunis	C															2			
Union of South Africa:																			
Cape Province	C	P	P		P														
Orange Free State	C		P						P	P	P	P							
Transvaal	C				P	7													
Venezuela: Maracaibo	D	1		2	1														

Place		July, 1927	August, 1927	September, 1927	October, 1927	November, 1927			December, 1927		
						1-10	11-20	21-30	1-10	11-20	21-31
Algeria	C	376	459	382	682						
Oran	C	14	10	16	11						
Indo-China	C	19	3	21	25	13	3	22	10		
Syria:											
Aleppo	C										1
Beirut	C								1		1
Damascus	C		3	5	22		13		4	6	2

Place		July	August	September	October	November	December
Angola	C	42	2	5	73		
	D				2		
Congo	C			5	77		
Cuanza-Norte	C			1			
Cuanza-Sul	C				2		
Loanda	C			1			
Zaire	C			3	4	1	
Brazil: Porto Alegre	C	5	3	3	4		
British East Africa: Zanzibar	C				2		
	D				1		
Chosen	C	19	2				
	D	6					
Ecuador, Guayaquil	C		2	2	1	1	4
France	C	23	6	8	7	4	
Gold Coast	C	1	1	5			

Place		July	August	September	October	November	December
Greece	C	3	3	4	4		1
Latvia	C				2		
Mexico	D	93	73	55			
Morocco	C	53	76	51	81		
Nigeria	C	492	91	237			
	D	83	20	70			
Persia	D					2	
Spain: Madrid	D					1	
U. S. S. R.:							
Railways, etc.	C	11	6				
Other territories in Europe	C	146	111				
Transcaucasus, Siberia, and Central Asia	C	36	29				
Ukraine	C	16	4				

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

TYPHUS FEVER

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

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927: 5	12	19	26	December, 1927: 3	10	17	24	31	January, 1928: 7	14
Algeria: Oran	C													1	1		
Bulgaria: Sofia	C				17	3	1	2					1	1	4	1	
	D						1										
Chile:																	
Antofagasta	D	1			1												
Talcahuano	D	1															
Valparaiso	C	2		1				1		1	1						
	D		2	1				1	1								
China:																	
Manchuria—Harbin	C	3	2					1									
Tientsin	C	1		2													
Egypt	C	24	2		12		4			1	7	3		1			
	D	1	3		5						5	1					
Port Said	C				1						1						
Ireland (Irish Free State):																	
Cork County	C	1										3				1	
Donegal County, Letterkenny	C				4												
Mexico:																	
Guadalajara	D									1							
Mexico City, including municipalities in Federal District	C	16	17	19	18	9	6	2	11	7	6	4		4	4	4	3
	D						2						1	1	3	1	
Palestine:																	
Haifa	C		4		2				1	1							
Herzliah	C									1							
Jaffa	C		2		1					1							
Nazareth	C	1	2						1								
Safad	C	1	2							1		1					
Tel-Aviv	C		1	1	2				1	1	1						
Poland	C	99	50	35	19	35	12	6	11	13	28	17	35				
	D	10	6	2	4	6	3		2	1	5		4				
Portugal: Oporto	C		1			1								1			

Rumania	C	27	36	16	17				2	6	8						
	D	4	1		2												
Syria: Aleppo	C			2												2	
Tunisa	C	29	14	1	3			1					1	1			
Union of South Africa:																	
Cape Province	C	P	P	P	P		P	P	P	P	P	P	P				
Natal	C	P	P	P	P		P	P	P	P	P	1	P				
Orange Free State	C	P			P							P					
Transvaal	C	18	1		5		P	P	P	P	P						

Place		1927				November, 1927			December, 1927		
		July	August	September	October	1-10	11-20	21-30	1-10	11-20	21-31
Algeria	C	67	33	10	12						
	D	13			1						
Algiers	C	2	2	6	2						
Bulgaria	C	12	24	7	2						
	D		1	2	1						
Morocco	C	148	76	7	11	5	14	7	5	6	75

Place		July	August	September	October	November	December
Argentina	C					1	
Chosen	C	72	17				
	D	8					
Chemulpo	C	1	2				
Gensan	C	2					
Seoul	C	2	3		2		
	D	1			1		
Czechoslovakia	C	6					
Greece: Athens	C	1		2			1
Japan	C	1					
Latvia	C	6					
Lithuania	C	44	18	7	9	18	
	D	5	8	1	1	1	

Place		July	August	September	October	November	December
Mexico	D	12	38	14			
Peru:							
Arequipa	D		2	1	2		
Lima	D	8					
U. S. S. R.:							
Railways, etc	C	30	22				
Transcaucasus, Siberia, and Central Asia	C	79	69				
Ukraine	C	96	85				
Other territories in Europe	C	732	552				
Yugoslavia	C	11	9		1	1	
	D	4	1				

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

YELLOW FEVER

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

Place		July 3-30, 1927	July 31-Aug. 27, 1927	Aug. 28-Sept. 24, 1927	Sept. 25-Oct. 22, 1927	Week ended— Oct. 29, 1927	November, 1927				December, 1927					Jan. 7, 1928
							5	12	19	26	3	10	17	24	31	
Belgian Kongo: Boma and Matadi	C														7	
Ashanti: Obuasi	C		1													
	D		1													
Dahomey:																
Grand Popo	C									1						
	D									1						
Porto Novo	C	1														
	D	1														
Ivory Coast	C	1												1		
	D	1												1		
Liberia: Monrovia	C			1												
Nigeria	C			2												
	D			2												
Senegal	C	3	10	21	31	9	16	6	7							
	D	3	9	21	31	8	10	4	6							
Dakar	C	1			12	3	6		5	2	1	4			1	1
	D				7	2	4		4	2	1	4			1	1
Geoul	C				1											
	D				1											
Goree Island	C			2												
	D			2												
Kebemer	C				2											
	D				2											
Kelle	C				2	1										
	D				1	1										
Keur Samba Kane	C					1	1									
	D						1									
Keur Madiop	C					1										
	D					1										
Khombole	C		3		3				1							
	D				3				1							
Louga	C				1	2	1	1								
	D				1	2	1	1								

Mekhe	C				1	1	2	2								
	D					1	1	1								
M'Dande	C				1		2	1								
	D				1		1									
Ouakham	C	2	2													
	D		1													
Pout	C			1												
	D			1												
Rufisque	C				1											
	D				1											
Saint Louis	C		2		1											
	D		2		1											
Sebikotane	C				1		2	1								
	D				1			1								
Thies	C	1		3	8	1	2	1	1							
	D	1		3	8	1	2	1	1							
Tiaroye	C			1												
	D			1												
Tivaouane	C			1												
Togoland	C		1													
	D		1													

Place		July	August	September	October
Gold Coast	C	15	2	6	1
	D	4	2	4	1

X