PUBLIC HEALTH REPORTS

VOL. 46 MARCH 6, 1931 NO. 10

THE PREVALENCE OF INFLUENZA

United States.—For the week ended February 21, 1931, 11,135 cases of influenza were reported by State health officers to the Public Health Service. This figure indicates but little change in the prevalence of the disease in the United States as a whole during the last four weeks.

Most of the States along the Atlantic coast line reported decreased prevalence of influenza as compared with the reports for the preceding weeks. In Illinois and Indiana the number of cases of influenza continued to decline. In Michigan and Wisconsin there was a slight increase for the week. In California 300 cases of influenza were reported for the week ended February 14, 1931, and 513 cases for the week ended February 21.

Europe.—In England and Wales the prevalence of influenza increased slightly during the week ended February 7, 1931. A report from the Health Section of the League of Nations, dated February 14, states: "The disease is chiefly prevailing in the northern part of England and in the southern counties of Wales. In two or three communities, including troops, influenza appears to have been associated with cerebrospinal fever. Since the first of January, 8 cases of the latter disease were reported in the Aldershot Command, 6 cases among the personnel of the Royal Air Force at Uxbridge, and 5 in the Eastern Command."

In Sweden 17,467 cases of influenza were reported during the first two weeks of January and 29,465 cases were reported during the second two weeks of the month. The disease is very mild.

In Switzerland 7,426 cases of influenza were reported in 18 cantons during the week ended February 7, 1931, as compared with 6,882 cases during the preceding week.

In Spain the peak of the epidemic was believed to have been reached before February 17, 1931. In Madrid the general death rate fell from 47.7 per 1,000 population during he last week of January to 36.7 during the week ended February 7.

NOTE ON AN OUTBREAK OF MALARIA IN A RAILROAD CAMP, RAWSON SWITCH, CALIF.

By J. C. GEIGER, *Professor of Epidemiology, University of California*, and J. P. GRAY, *Epidemiologist, California State Department of Public Health*

An outbreak of malaria involving 22 adult Mexicans out of a crew of 30 is here recorded. Although the majority of these cases are amply confirmed clinically, 11 were proved positive by microscopical examination. Of these, 8 are known as to type, 4 being classified as tertian and 4 as estivo-autumnal. The outbreak occurred in a railroad camp at Rawson Switch, near Red Bluff, Calif.

Dr. F. J. Bailey, local surgeon, at Red Bluff, of the railroad involved, reported on July 25, 1930, the presence of a number of cases of illness in this camp which he thought was malaria. Further investigation by the chief surgeon's office was begun on July 26 by one of us (Geiger).

EPIDEMIOLOGICAL INVESTIGATION

This camp is situated on a siding known as Rawson, approximately halfway between Gerber and Red Bluff. At the time of the first visit 11 persons were ill, 3 ill enough to be in bed, all showing practically the same clinical symptoms, namely, chills, fever, muscular pains, and headache. Six of these 11 had not had quinine, and the blood of 5 was subsequently proved positive for malaria parasites. Ordinarily, this section gang numbers about 36, and apparently the turnover in personnel is very light; in fact, 30 members of the crew had been together for at least 9 months. This crew had reached their present geographical situation on July 16. Previous to this they had been situated at Jessup Siding, 1½ miles north of Anderson, Calif. There they had been continuously for the preceding nine months.

In going into the history of the situation at Jessup, it was ascertained that the foreman had a similar crew at Jessup during the early summer months in 1929 of which 15 or 16 members were ill with symptoms similar to those reported in this particular group in 1930. The chief surgeon's office, however, had no record of this illness. Of the crew in 1929 it is interesting to record that two members are still present (I. A. and P. H.). I. A. has also been ill in 1930 and his blood is now positive for malaria parasites, type estivo-autumnal. Field investigation of the camp and its surroundings at Rawson failed to reveal the breeding of *Anopheles* mosquitoes within flight limits. Moreover, since it was ascertained that the same type of illness was present in the camp before leaving Anderson on July 15, the probable causative factors must have been present at Anderson. This point is emphasized, since seven were ill before leaving this camp site.

The first illness at Anderson occurred about June 15, when two or three men came down. The foreman reported mosquitoes extraordinarily prevalent, particularly about the middle of June. Investigation at Anderson on July 30, 1930, further revealed that the cars of this camp, nine in number, were on a siding situated between two irrigation ditches which were profusely leaking water, not only onto the roadside but onto adjoining territory. Furthermore, one of these ditches runs over the right of way of the railroad and is carried in a pipe along the right of way. This pipe is buried to a certain extent but allows water to seep out along the right of way on both sides of the track. The sides of the irrigation ditch were covered with undergrowth and contained large amounts of tall grass known as cat-tails. The water seepage was on the roadside and in the ditches and territory practically surrounding the adjacent camp site.

At the time of our visit on July 30, although the conditions were ideal for mosquito breeding, only moderate breeding was noted by the presence of larva and pupæ of *Anopheles*. Adult mosquitoes were noted when one walked through the surrounding grass. The sun was up and exceedingly bright and the weather was warm at the time of this investigation. The disturbed mosquitoes, however, would bite (on the bared forearms), and the variety ascertained in the field investigation was *Anopheles quadrimaculatus*. Finally a number of residents of this particular locality were questioned and they confirmed the extraordinary flight of mosquitoes around July 15, their presence in considerable numbers at this time, and an illness usually in their entire families, probably clinical malaria. It is interesting to record that this particular district is not in the mosquito abatement district of the Anderson area. Furthermore, it is important to note that the cars and living quarters of this particular camp were not properly screened against mosquitoes; one car, in particular, was not screened at all, two cars had window screens, but doors unscreened and wide open, and the majority of the screened cars had screens with entirely too large a mesh to protect against mosquitoes.

DISCUSSION

This is undoubtedly an outbreak of malaria involving 22 persons out of a camp of 30, 11 of which were proved positive by microscopical examination. The field conditions, as to the possibility of mosquito breeding, surrounding the original camp and adjacent territory could be considered ideal when investigated on July 30. Moreover, the statement of residents confirmed these epidemiologic data. The presence of two patients who had also been ill in 1929, the blood of one still being positive, may account in part, because of an intensive localized transmission by infected mosquitoes, for the large number of cases prevalent in 1930. The effect of the number of original carriers of

sexually differentiated forms of parasites on the disease incidence in this group of Mexicans can only be surmised. It has been suggested that the mosquito abatement district limits at Anderson be extended to include the Jessup area. Apparently the conditions at the time of investigation indicate a decided increase in malaria in this district, most of which is obviously unreported. A list of 19 of the cases in the railroad camp, with type of parasites found, is presented herewith.

The unsupported clinical diagnosis in 11 cases by laboratory findings is to be regretted, but the cessation of symptoms after quininization is more than presumptive proof of its correctness.

List of 19 cases, with type of parasite found in 8 cases examined

Case (all adults)	Type of parasite found	Case (all adults)	Type of parasite found
I. A.	Estivo-autumnal.	P. G.	Not examined.
P. H.	Not examined.	A. P.	Do.
B. H.	Do.	D. G.	Do.
F. L.	Estivo-autumnal.	L. G.	Tertian (Doctor Doane and Doctor Frye).
Y. B.	Not examined.		
V. D.	Estivo-autumnal.	M. D.	Do.
Y. A.	Not examined.	N. L.	Do.
J. M.	Do.	O. P.	Not examined.
R. B.	Do.	M. De La T.	Estivo-autumnal.
C. L.	Do.	C. S.	Tertian.

The names of three others are missing, since they left camp and no record was available. The type in three other cases is not available, being reported by the local surgeon only as positive, and the slides were not retained. Those marked "not examined" had been given quinine over a period of several days.

MEASUREMENTS FOR JAEGER'S TEST TYPES USED IN NEAR VISION TESTS

The Jaeger test types used in tests for near vision are not uniform and have never been standardized as has the Snellen scale used in tests for far vision. Recently an inquiry was received by the Public Health Service regarding the standard type size of Jaeger's test types; and in view of the fact that apparently little has been done to standardize the size of these types, it is believed that the information contained in the reply might be of considerable interest to others.

The investigator was unable to obtain a copy of the first edition of Jaeger's test types published in Vienna in 1857, but contemporary measurements by Zehender (based on angles subtended) give the following results computed in millimeters, presumably the height of the small letters:

Type No.	Height	Type No.	Height	Type No.	Height	Type No.	Height
	Mm.		*Mm.*		*Mm.*		*Mm.*
1	0.516	6	1.4	11	2.43	16	7.74
2	.7	7	1.77	12	2.98	17	10.6
3	1.03	8	1.99	13	3.32	18	13.27
4	1.22	9	[1] 2.21	14	4.42	19	16.35
5	1.29	10	[1] 2.21	15	5.97	20	19.45

[1] About.

The third edition (Schrift-Scalen. Professor v. Jaeger, Jr., 3. Auflage, Wien 1860 k. k. Hof- und Staatsdruckerei) contains types 1 to 20 in German (Gothic), French, and English. The measurements of the types of this third edition for the German and the English series in capitals and in lower case letters are as follows:

Type No.	German (Gothic) caps	German (Gothic) lower case	English caps	English lower case "e" and "o"	Type No.	German (Gothic) caps	German (Gothic) lower case	English caps	English lower case "e" and "o"
	Mm.	*Mm.*	*Mm.*	*Mm.*		*Mm.*	*Mm.*	*Mm.*	*Mm.*
1	0.75	0.5	0.75	0.5	11	3.6	2.6	3.4	2.25
2	1.0	.75	1.0	.75	12	4.0	3.0	3.8	2.5
3	1.5	1.0	1.3	.85	13	5.0	3.5	4.2	2.75
4	1.7	1.2	1.4	.9	14	6.2	4.6	5.1	3.6
5	2.0	1.35	1.7	1.2	15	8.2	6.4	6.6	4.5
6	2.25	1.45	2.0	1.35	16	10.7	8.2	7.5	5.3
7	2.5	1.8	2.2	1.5	17	14.4	11.0	10.5	7.2
8	2.8	2.0	2.5	1.65	18	18.0	14.0	13.0	8.7
9	3.0	2.2	2.75	1.8	19	22.0	17.0	18.6	14.0
10	3.3	2.5	3.0	2.0	20	26.0	20.0	26.7	18.6

In 1863 Professor Jaeger published a supplement from the same publishers and also from Victor Masson of Paris, giving four larger types as follows:

Type No.	German (Gothic) caps	German (Gothic) lower case	English caps	English lower case "e" and "o"
	Mm.	*Mm.*	*Mm.*	*Mm.*
21	36.0	24.0	29 0	22.0
22	48.0	32.0	36.0	27.5
23	52.0	38.5	47.0	34.0
24	70 0	45.0	61.5	43.0

In 1865 an edition in vest-pocket form was printed by the same Hof- und Staatsdruckerei (Court and State Printing Establishment) in Vienna (sold by L. W. Seidel and Son), in English only. These types had the following measurements:

Type No.	Caps	Lower case	Type No.	Caps	Lower Case	Type No.	Caps	Lower case
	Mm.	*Mm.*		*Mm.*	*Mm.*		*Mm.*	*Mm.*
1	0.75	0.5	9	2.6	1.75	17	10.5	7.4
2	1.0	.7	10	3.1	2.0	18	13.8	8.8
3	1.2	.85	11	3.45	2.2	19	18.8	14.0
4	1.45	1.0	12	3.8	2.5	20	27.5	18.5
5	1.65	1.2	13	4.3	2.8	21	30.2	24.0
6	1.9	1.3	14	5.2	3.5	22	33.5	29.5
7	2.0	1.5	15	6.7	4.5	23	[1]	36.0
8	2.5	1.55	16	7.7	5.2	24	[1]	43.5

[1] No caps.

In 1868 a series of (Jaeger) types was published in New York, having the following measurements for capital letters:

Type No.	Height	Type No.	Height	Type No.	Height	Type No.	Height
	Mm.		*Mm.*		*Mm.*		*Mm.*
1	0.75	6	1.8	11	3.0	16	7.5
2	.85	7	2.0	12	4.0	17	12.0
3	1.0	8	2.2	13	5.0	18	15.0
4	1.3	9	2.4	14	6.0	19	20.0
5	1.7	10	2.8	15	6.5	20	25.0

The lower case types ranged correspondingly, No. 1 measuring 0.55 millimeters and No. 20, 19.2 millimeters. Other more recent American sets of Jaeger test types have been as irregular and variable throughout their range as these. Further, the character and shape of the type have varied from number to number, some being narrow, some broad, some bold face, and some delicately shaped, with varying serifs.

An attempt has also been made to correlate these with the Snellen types, but the two kinds of type are used altogether differently, the matter of accommodation coming prominently to the fore in the use of the Jaeger type. It is also believed that Jaeger's idea of using a logical text in an accustomed font has proved to be more suitable for near vision than the random capital letters of the Snellen system. In spite of the divergencies and irregular jumps in the different sets of Jaeger type examined, there was, in the earlier sets, a fair agreement as to the sizes of Jaeger No. 1 and Jaeger No. 20. Using an even geometrical progression between these limits (0.75 mm. for No. 1 capitals and 25.0 mm. for No. 20 capitals), the following set of measurements has been calculated. It is believed that a set of types with capital letters of these heights, and with small letters two-thirds as high, of any standard style of type commonly used in books, would provide a satisfactory range with even geometrical gradient, and would correspond closely enough with the various original and recent sets of Jaeger test types, eliminating the irregularities which are apparent in any of these series:

Type No.	Height of capitals in millimeters	Approximate size in point system	Type No.	Height of capitals in millimeters	Approximate size in point system	Type No.	Height of capitals in millimeters	Approximate size in point system
1	0.75	3¼	8	2.73	12	15	9.93	42
2	.90	3¾	9	3.28	14	16	11.95	50
3	1.08	4½	10	3.95	17	17	14.37	60
4	1.30	5½	11	4.75	20	18	17.28	73
5	1.57	6½	12	5.71	24	19	20.79	88
6	1.89	8	13	6.87	29	20	25.00	105
7	2.27	10	14	8.26	35			

Aside from the irregularity in sizes and styles of type, one of the most serious defects of the different sets of Jaeger test types, old as well as recent, has been the deformity of the finer type letters from repeated use of the plates. It is therefore believed that such plates should be made of steel or other hard metal. It is probable, also, that a more accurate series can be made by special processes of reducing or enlarging standard type sizes to the exact dimensions in millimeters rather than by trying to select approximate sizes from standards in stock.

THE ACTION OF SULPHYDRIL, IRON, AND CYANIDE COMPOUNDS ON THE OXYGEN CONSUMPTION OF LIVING CELLS

By SANFORD M. ROSENTHAL, *Pharmacologist*, and CARL VOEGTLIN, *Chief of Division of Pharmacology, National Institute of Health*

The utilization of oxygen by living cells is a complex procedure, involving many chemical reactions. The rate of oxygen consumption may be influenced by physical and chemical changes which are produced within cells or their environment. The object of the experiments to be described in this paper is to add further information concerning the action of certain normal chemical tissue constituents and related chemicals on the oxygen consumption of tissues. In view of previous investigations on the effect of glutathione and cysteine on the rate of oxygen consumption of washed tissues and dried tissue residues, a study has been made of the effect of these sulphydril compounds on living cells. Hemin was selected because iron-porphyrins closely related to hemin seem to occur in all cells. In fact, Fischer (1) recently isolated a hemin from yeast cells which appears to be identical with hemin obtained from hemoglobin. The action of hemin is also of interest in view of the fact, demonstrated by the spectroscopic studies of Warburg and collaborators (2), that the respiration enzyme is closely related to hemin. Besides hemin the effect of methemoglobin, oxyhemoglobin, ferrous sulphate, and ferric tartrate has been investigated. The last problem has dealt with the study of the effect of iron compounds and glutathione on the inhibition of oxygen consumption produced by cyanide, a substance which for many years has been regarded as a typical "poison" of cell respiration.

Previous studies on the rate of oxygen consumption of cells under the influence of certain chemicals have yielded information of considerable value in formulating conceptions regarding the *mechanism* of cellular respiration. Thus Warburg believes that the sole respiration catalyst is the iron-containing respiration enzyme, and that changes in the rate of oxygen consumption brought about by the action of certain chemicals (HCN, H_2S, CO, and As_2O_3) are due to their chemical action on the respiration enzyme. The possibility still exists, however, that there are physiological substances which may act, along with the respiration enzyme or independently of it, as essential factors in the mechanism of cellular respiration. Barron and Harrop (3) recently have demonstrated an acceleration of respiration by methylene blue, which they believe is independent of iron catalysis. However, Wendel and Shaffer (4), and Warburg, Kubowitz, and Christian (5) explain these results on the basis of a methemoglobin catalysis. Quite recently Michaelis and Salomon (6) have

demonstrated an accelerating effect, similar to that of methylene blue, obtained by tissue extracts, which they consider as being independent of iron-catalysis.

In view of these considerations it was hoped by the study of the action of the above mentioned sulphur and iron compounds to obtain further information concerning the mechanism of cell respiration.

EXPERIMENTAL METHOD

The oxygen consumption was measured by Warburg's micro-respiration apparatus (7) with Haldane micro-manometers. The respiration vessel was equipped with a side arm for the introduction of solutions during the course of an experiment, and with a central tube into which 0.1 c. c. of 5 per cent NaOH was placed for the absorption of CO_2. The capacity of the vessels was about 18 c. c. and the total volume introduced was 2.6 c. c. (including the alkali). All experiments were run at a temperature of $37.6° \pm 0.02$. The rat tissues were obtained immediately after decapitation and bleeding. They were minced with fine scissors, and weighed quantities were introduced into the vessel with Locke's solution containing 0.2 per cent glucose. In the case of testis a suspension was made which was pipetted into the vessels. Air was used in the respiration vessels during all of these experiments.

Crystalline SH glutathione was prepared either according to the method of Hopkins (8) or following Kendall's technique (9), by Dr. J. M. Johnson, of this laboratory. Elementary analysis and oxygen uptake gave values in agreement with theoretical. The cysteine was purified from commercial samples according to the method of Warburg (10). The hemin was prepared by the glacial acetic acid method from ox blood and was once recrystallized from pyridin and glacial acetic. All solutions of these chemicals were made neutral to litmus before being employed, and hemin was dissolved in the least amount of NaOH, so as to avoid a shift in pH of the Locke solution. The composition of the Locke solution was 0.92 per cent NaCl, 0.042 per cent KCl, 0.018 per cent $CaCl_2$, 0.015 to 0.03 per cent $NaHCO_3$, 0.20 per cent glucose, unless otherwise stated.

The concentrations of substances added are expressed in terms of the final concentration in the 2.5 c. c. volume of solution in the respiratory vessel. In case of glutathione normality is expressed in respect to the sulphur content.

EFFECT OF GLUTATHIONE ON THE OXYGEN CONSUMPTION OF TISSUES

Both oxidized and reduced glutathione have been added to various tissues and cell suspensions with no effect on their oxygen consumption which could not be accounted for by the O_2 required for the

oxidation of the SH group. The following tissues have been studied: Rat liver, kidney, brain, testicle, Jensen rat sarcoma, dog blood, dog serum, chicken erythrocytes, chicken serum, and, finally, yeast cells. During the course of this work Michaelis and Salomon (6) reported no effect from SH and S–S glutathione and cysteine on the oxygen consumption of rabbit erythrocytes.

The behavior of the various tissues toward reduced glutathione presented some interesting differences. The tissues could be divided into the following three groups:

(*a*) Those which kept the glutathione in the reduced state during the length of the experiment, so that there was no increased oxygen

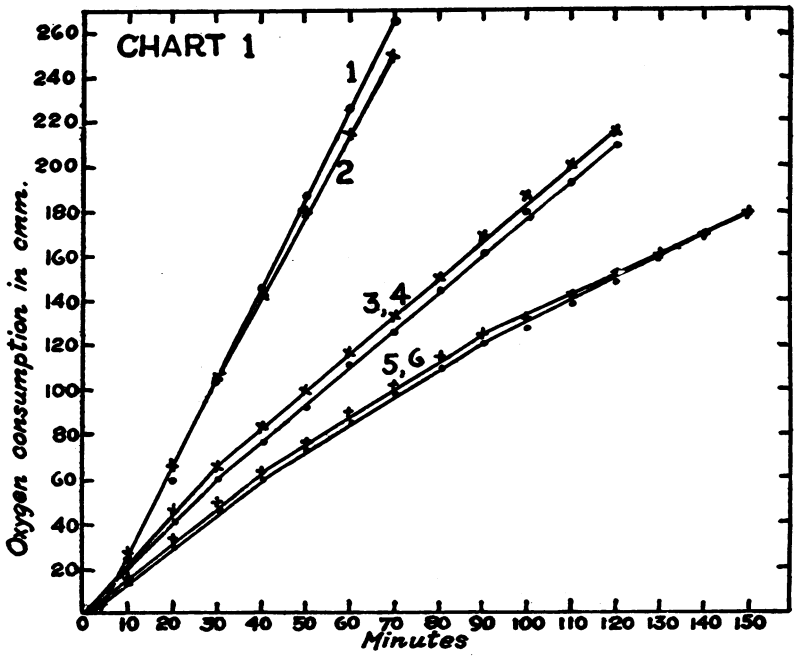

CHART 1.—The absence of effect of crystalline SH-glutathione on the oxygen consumption of rat tissues. Curve 1, 0.3 gm. brain; Curve 2, 0.3 gm. brain+N/100 glutathione (final concentration); Curve 3, 0.2 gm. Jensen sarcoma; Curve 4, sarcoma+N/100 glutathione; Curve 5, 0.3 gm. testes+N/100 glutathione; Curve 6, 0.3 gm. testes. All in Locke's solution. Glucose present in brain experiment only

uptake due to the added glutathione, and the nitroprusside reaction at the end of the experiment was strongly positive on the trichloracetic acid extract. In this group came liver, brain, testicle, Jensen sarcoma, and chicken erythrocytes. (Charts 1 and 2.)

(*b*) Those tissues which were unable to keep glutathione reduced, but in the presence of which the oxidation proceeded at a rate so slow as to indicate that the tissues took no active part in the rate of oxidation of the glutathione. In this group came kidney (Chart 2) and yeast cells. The relatively small amount of yeast cells (4 mg.)

employed may be a capacity factor involved in these results. That the increase in oxygen uptake was due to the oxidation of the SH group of the glutathione could be easily demonstrated by the negative nitroprusside test made upon tissue filtrates or trichloracetic acid extracts at the end of the experiments.

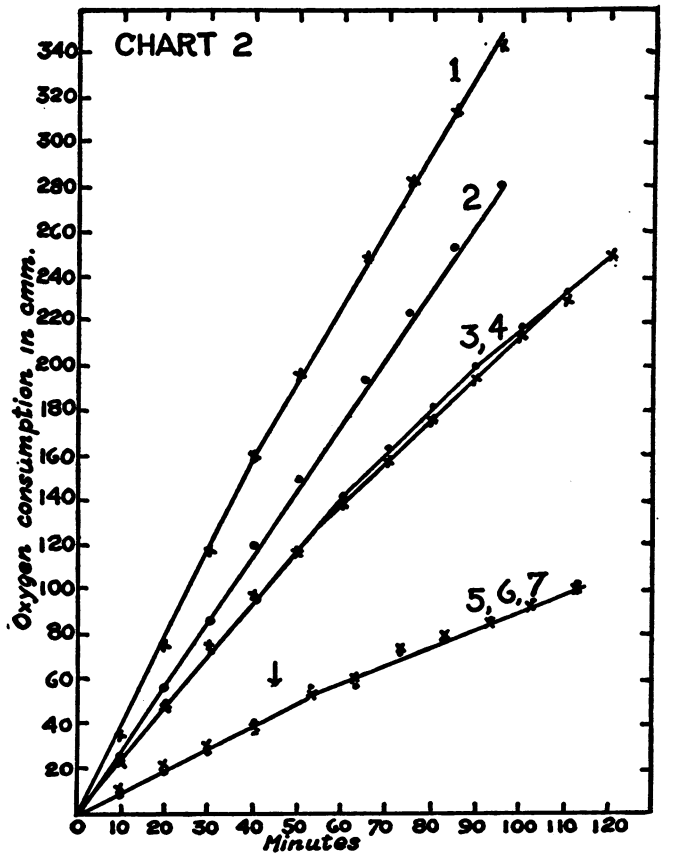

CHART 2.—The effect of SH-glutathione on the oxygen consumption of tissues. Curve 1, 0.2 gm. rat kidney+N/100 glutathione; Curve 2, 0.2 gm. rat kidney; Curves 3 and 4, 0.3 gm. rat liver with and without N/100 glutathione; Curves 5, 6, and 7, 1 c. c. washed rooster erythrocytes, alone, with N/500 and N/1,000 SH-glutathione added at arrow. Locke's solution. Glucose present except with erythrocytes. A slow rate of oxidation of glutathione occurs only with the kidney

(c) Those tissues which accelerated the rate of oxidation of glutathione. It was found (Charts 3 and 4) that dog or rooster blood caused complete oxidation of 3.06 mg. glutathione in 30 to 50 minutes. That this acceleration of oxidation is a property of the serum in the case of rooster blood is shown by the fact that washed rooster erythrocytes (nucleated cells) are able to keep the glutathione reduced (Chart 2). Similar results have been obtained with cysteine (see

below). We have also found that SH glutathione is rapidly oxidized when added to fresh egg white.

These experiments are of interest, because they demonstrate a difference of behavior of sulphydril compounds in different tissues.

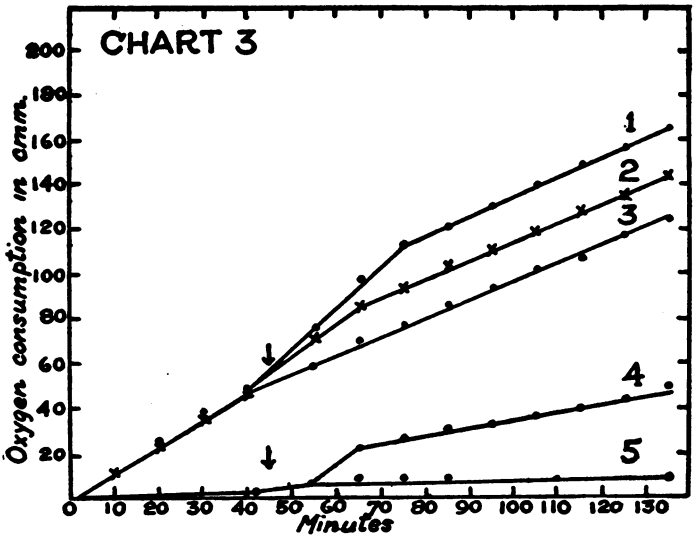

CHART 3.—The addition of SH-glutathione to blood of rooster. Curve 1, 2 c. c. defibrinated whole blood+N/250 glutathione; Curve 2, blood+N/500 glutathione; Curve 3, blood alone; Curve 4, 1 c. c. serum+N/250 glutathione; Curve 5, serum +N/500 SH-glutathione added at arrow. In Locke's solution; no glucose. The rapid oxidation of the glutathione is due to the presence of serum

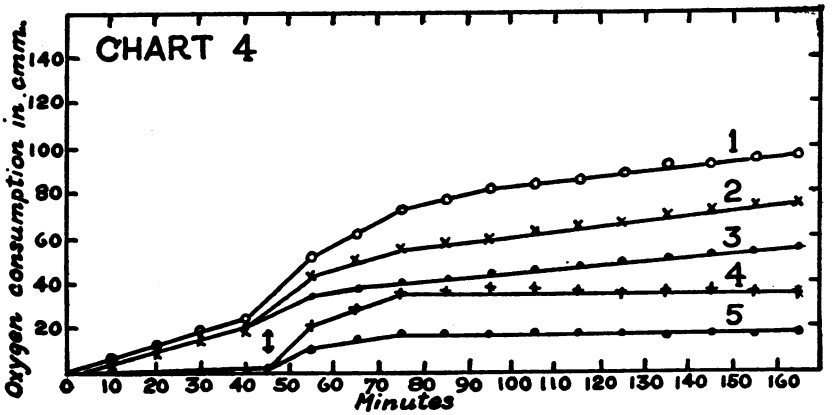

CHART 4.—The addition of SH-glutathione to dog blood. Curve 1, 2 c. c. defibrinated whole blood+N/250 glutathione; Curve 2, blood+N/500 glutathione; Curve 3, blood alone; Curve 4, 1 c. c. serum+N/250 glutathione; Curve 5, serum+N/500 glutathione added at arrow. Locke's solution; no glucose

It remains to be seen whether this difference in the rate of oxidation of SH glutathione in the presence of different tissues or blood serum is in any way connected with the reducing power of the tissues. Suggestive evidence along this line is furnished by the fact that Voegt-

lin, Johnson, and Dyer (11), by means of redox indicators, have found that rat liver and testis exhibit a relatively high reducing power, whereas blood plasma and serum are unable to reduce even very small amounts of the indicators under anaerobic conditions. The rapid oxidation of SH glutathione in serum may be due perhaps to the catalytic effect of traces of copper, which are known to occur in normal human and horse serum. In fact, Warburg (12) has devised a method for the estimation of serum copper, which rests on the catalytic action of copper on the oxidation of pure cysteine.

Two experiments were made with S–S glutathione obtained by aerating a solution of crystalline reduced glutathione until the nitro-

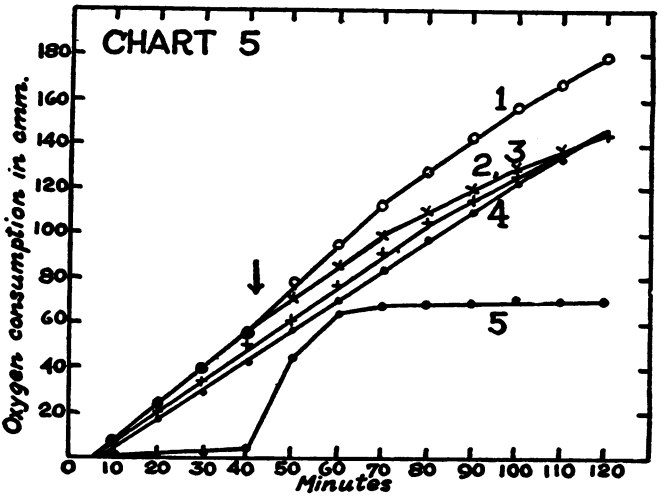

CHART 5.—The inability of large amounts of cysteine or hemin to bring about the oxidation of glutathione in the presence of rat testis. Curve 1, 0.2 gm. testis+5 mg. glutathione+0.4 mg. hemin, 2 mg. cysteine added at arrow; Curve 2, testis+5 mg. glutathione, 2 mg. cysteine added at arrow; Curve 3, testis+0.4 mg. hemin, 2 mg. cysteine at arrow; Curve 4, testis alone; Curve 5, 2 mg. cysteine in Locke's solution, 0.4 mg. hemin at arrow. All experiments with Locke's solution plus glucose

prusside test became negative. The oxygen consumption of the testis was not affected by the presence of N/100 S–S glutathione. (Chart 13.) [1]

After the completion of these experiments a paper appeared by Meldrum and Dixon (13) in which it was reported that the oxidation of SH glutathione, and the oxidation catalysis which it produced in a thermostable muscle powder, appeared to depend upon the presence of a ferrocysteine complex. They demonstrated that muscle powder or washed fresh rat muscle could inhibit the oxidation of crystalline

[1] Preliminary studies were made upon the effect of SH glutathione on the rate of fermentation of Baker's yeast in a phosphate buffer of pH 5.99, containing 1.5 per cent glucose. The experiments were carried out in fermentation tubes. The presence of N/200 SH glutathione did not alter the rate of fermentation.

SH glutathione, while the addition of cysteine to the glutathione plus muscle powder caused an oxygen uptake in excess of that required for the oxidation of the SH compounds.

It was thus necessary to determine whether the ability of certain fresh tissues to keep glutathione reduced, as well as the absence of any catalytic action of glutathione on the oxygen consumption of tissues, was due to the absence of sufficient cysteine in these tissues. Experiments were therefore carried out in which SH glutathione, hemin, and cysteine were added separately and together to tissues.

Jensen rat sarcoma and rat testis were able to keep reduced 5 mg. of crystalline glutathione (N/153 final concentration) and 2 mg. of cysteine hydrochloride, individually or mixed, so that the oxygen up-

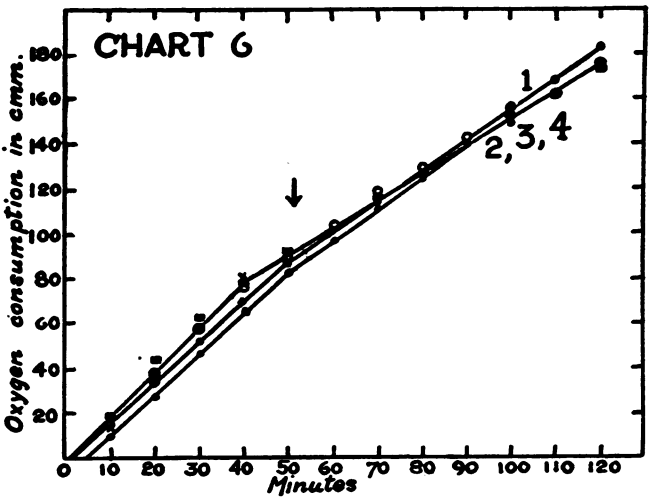

CHART 6.—The inability of glutathione or glutathione with cysteine to undergo oxidation in the presence of Jensen sarcoma, even when hemin is added. Curve, 1, 0.2 gm. sarcoma+2 mg. cysteine hydrochloride, 0.2 mg. hemin added at arrow; Curves 2, 3, and 4, sarcoma alone; sarcoma+5 mg. glutathione, 2 mg. cysteine added at arrow; sarcoma+5 mg. glutathione +2 mg. cysteine, 0.2 mg. hemin added at arrow

take was the same in their presence as in their absence. The addition of a relatively large amount of hemin, 0.4 mg. (M/4,000), was unable within the length of these experiments to bring about the complete oxidation of these SH compounds in the presence of these tissues, although the complete oxidation of 2 mg. of cysteine in Locke's solution in the absence of tissue was effected in 30 minutes by this amount of hemin. (Charts 5 and 6.)

The addition of cysteine to kidney or to kidney plus glutathione gave results analogous to those with glutathione. There was a slow increase in oxygen consumption, which could be shown in a qualitative way by the nitroprusside test to be due to the oxidation of the SH compounds. When hemin was also added there was a further ac-

celeration of the rate of oxidation, although it was not quite as rapid as cysteine-hemin oxidation in the absence of kidney. (Charts 5 and 7.)

From these experiments it may be concluded that the ability of certain fresh tissues to keep sulphydril compounds in the reduced state is not due to the "inactivation" of free cysteine or iron by the tissues, as Meldrum and Dixon found for thermostable muscle preparations.

In experiments to be reported elsewhere, we were unable to confirm the statement of Meldrum and Dixon (13) that the addition of small

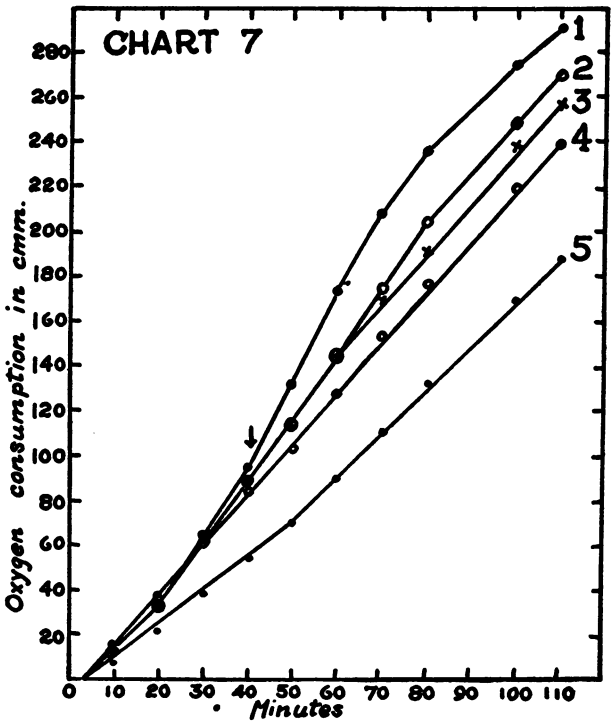

CHART 7.—The slow oxidation of glutathione and cysteine, with and without hemin, in the presence of rat kidney. Curve 1, 0.1 gm. kidney +5 mg. SH-glutathione+2 mg. cysteine, 0.4 mg. hemin added at arrow; Curve 2, kidney+5 mg. glutathione, 2 mg. cysteine added at arrow; Curve 3, kidney+5 mg. glutathione; Curve 4, kidney+2 mg. cysteine; Curve 5, kidney alone. Cysteine did not affect the rate of oxidation of glutathione. Locke's solution plus glucose

amounts of pure cysteine, with or without traces of iron, to solutions of crystalline SH glutathione exert an accelerating action on the oxidation of SH glutathione.

THE EFFECT OF IRON COMPOUNDS ON THE OXYGEN CONSUMPTION OF TISSUES

The only instance in which the oxygen consumption of cells has been influenced by iron compounds is described by Warburg (14). He found that the addition of small amounts of ferrous ammonium

sulphate to a granulæ suspension of sea urchin eggs produced an acceleration of the oxygen uptake.

The low solubility of most iron compounds in neutral and slightly alkaline buffer solutions makes it possible that their inability to influence the oxygen consumption of cells might be due to the fact that they are not in true solution or can not penetrate into the cells. Hemin is not free from these objections, because its solubility is very low, near neutrality.

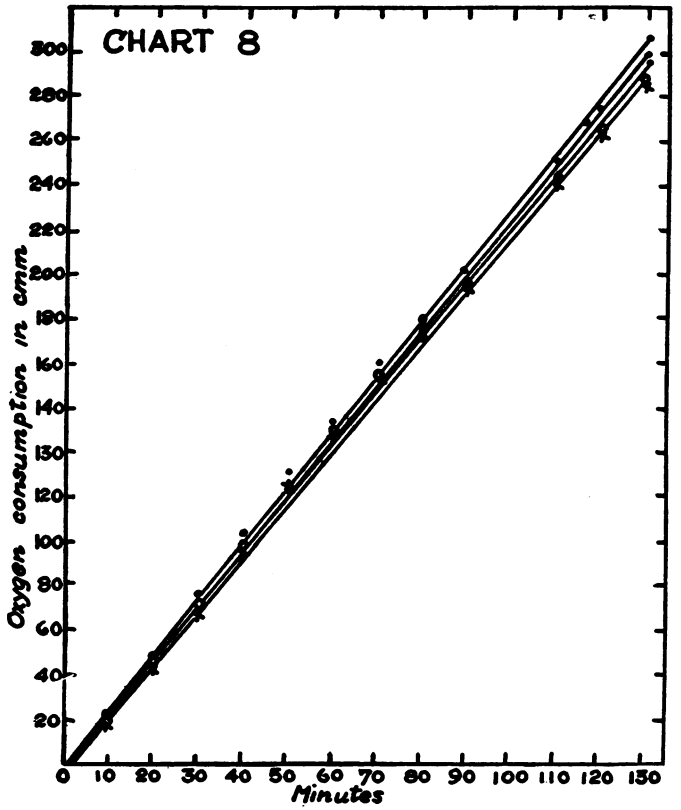

CHART 8.—The absence of influence of hemin on the oxygen consumption of Jensen sarcoma—0.3 gm. sarcoma in Locke's solution, no glucose. The curves represent sarcoma alone and sarcoma+hemin, M/5,000, M/10,000, and M/100,000, respectively

The addition of hemin[2] to rat tissues in no instance appreciably influenced the oxygen uptake, except that high concentrations in some experiments reduced the oxygen consumption, a fact which may be due to a toxic effect of hemin. Three experiments were done with testis and one with Jensen rat sarcoma in which hemin, in concentrations of M/2,000 to M/500,000, was present. (Chart 8.)

Five experiments were made with yeast in phosphate buffer at pH 7.84. In three of these, hemin in concentrations of M/5,000 caused

[2] Strictly speaking, the hemin is present under these conditions as the sodium salt, i.e., hematin.

an oxygen uptake of 10 to 14 per cent above normal. In the two other experiments no increase was produced with this concentration of hemin. More dilute solutions were ineffective in all experiments.

Other iron compounds were employed in connection with the cyanide studies to be described later. In these experiments ferric sodium tartrate, ferrous ammonium sulphate, methemoglobin and oxyhemoglobin had no significant effect upon the O_2 consumption of rat testis.

These negative findings with iron compounds are not easily explained. It may be, as Warburg believes, that normally the substances

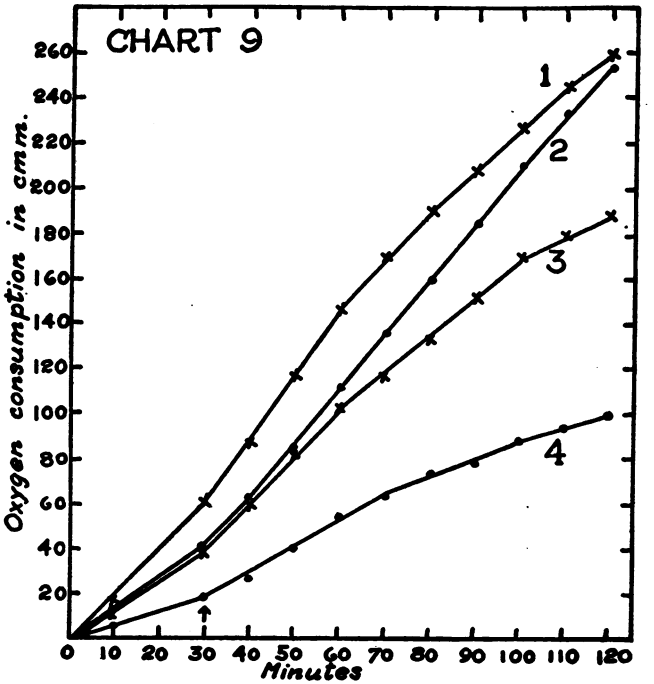

CHART 9.—The ability of an iron salt to counteract the effect of cyanide on rat testis. Locke's solution plus glucose in these and all subsequent experiments. Curve 1, 0.3 gm. testis+N/1,000 ferrous ammonium sulphate; Curve 2, testis alone; Curve 3, testis+N/1,000 ferrous ammonium sulphate, N/3,000 sodium cyanide added immediately after; Curve 4, testis+N/3,000 cyanide. Locke's solution+glucose. The increase in the oxygen uptake of the testis+iron over the control can be explained by the oxidation of the ferrous salt

which react with iron to form the respiration enzyme are not present in excess in cells; in which case the addition of hemin, ferrous ammonium sulphate, etc., would not be expected to increase the oxygen consumption. We believe, however, that at least two other factors are involved: First, the physical state of the added iron, which, as we have already pointed out, may prevent its penetration into the cells. Second, most living tissues possess a remarkable capacity to regulate the rate at which oxidations can proceed in cells and in their environ-

ment. Thus we have shown that a mixture of cysteine and hemin, which would completely oxidize in 30 minutes in Locke's solution, undergoes no appreciable oxidation for two hours in the presence of testis or rat sarcoma.

CYANIDE ACTION ON RESPIRATION. THE EFFECTS OF IRON AND GLUTATHIONE ON CYANIDE INHIBITION

The studies by Warburg and his coworkers and by numerous other investigators have shown that with artificial models and buffer solutions, oxidative processes are inhibited by concentrations of cyanide so small that the action of cyanide must be on the minute quantities of heavy metal catalyst present. A similar mechanism of

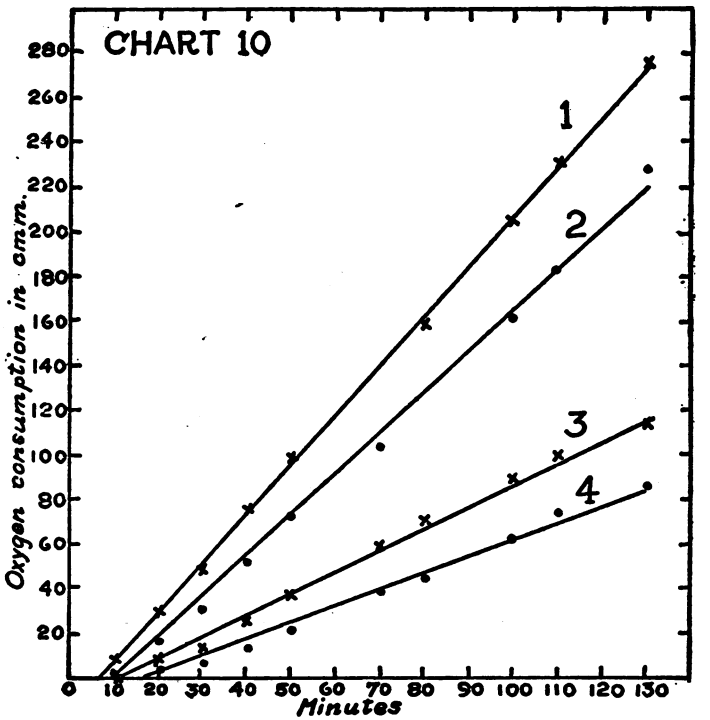

CHART 10.—The absence of antagonism between hemin and cyanide. Curve 1, 0.3 gm. testis; Curve 2, testis+N/2,000 hemin; Curve 3, testis+N/3,000 sodium cyanide; Curve 4, testis+N/2,000 hemin+N/3,000 cyanide added immediately after

cyanide action on living tissues was advocated by Warburg. The literature has been reviewed by Voegtlin, Johnson, and Dyer (15). Recently Dixon and Elliot (16) presented evidence that the O_2 consumption of mammalian tissues is not completely suppressed even by very high concentrations of cyanide. This conclusion has been rejected by Alt (17), who attributes the results of Dixon and Elliot to the use of media that are not physiologic to the tissues.

In previous experiments, Voegtlin, Johnson, and Dyer (15) found that, in the rat, death from a 1.5 minimum lethal dose of cyanide could be prevented by the intravenous injection of about five times this molar quantity of cysteine, cystine, glutathione, or thioglycollic acid. No effect was obtained from the injection of 0.2 to 2.2 molar quantity of iron salts. It was believed from these experiments that the sulphydril systems of the body play an important rôle in the toxic action of cyanide. Evidence in favor of such a view is the demonstration that cyanides increase the urinary excretion of thiocyanates. (For recent reference see R. G. Smith (18).)

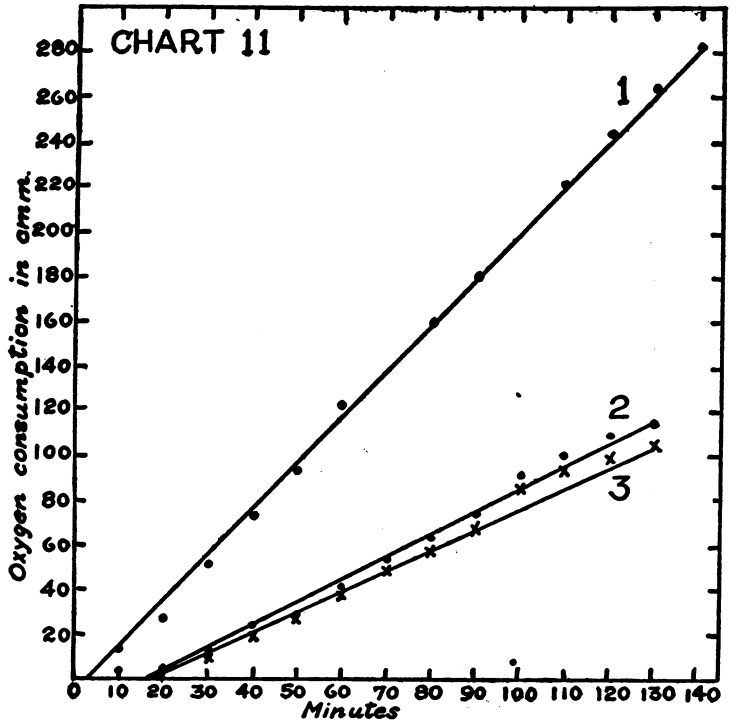

CHART 11.—The absence of antagonism between hemin and cyanide. Curve 1, 0.2 gm. testis+N/2,000 hemin; Curve 2, testis+N/3,000 cyanide; Curve 3, testis+a mixture of N/2,000 hemin with N/3,000 cyanide that had stood at 25° C. for two hours. The hemin and cyanide solutions used in Curves 1 and 2 were likewise made up two hours previous to their addition to the testis

We therefore have studied the effects of various iron compounds and of glutathione on the inhibition of oxygen consumption produced by sodium cyanide. With a concentration of ferrous ammonium sulphate (Mohr's salt) three times that of cyanide, the cyanide action could be partly prevented. In such an experiment on rat testis, at the end of two hours cyanide alone (N/3,000) produced an inhibition of oxygen uptake of 61.5 per cent, while cyanide plus the iron salt (N/1,000) produced an inhibition of only 27.5 per cent. (Chart 9.)

In a similar experiment with sodium ferric tartrate the inhibition of oxygen consumption by N/3,000 cyanide alone was 67.6 per cent, while cyanide plus N/1,000 iron tartrate gave an inhibition of only 40 per cent.

Experiments with hemin show that this substance can not prevent the reduction in the rate of oxygen consumption produced by cyanide. We were unable to employ quite as high a ratio of iron to cyanide, because of the apparent toxicity of hemin, but a ratio of 1.5 hemin to 1 cyanide was ineffective in two experiments (Charts 10 and 11). That hemin can react with cyanide *in vitro* with the formation of cyanhematin, recognizable by a characteristic absorption-spectrum,

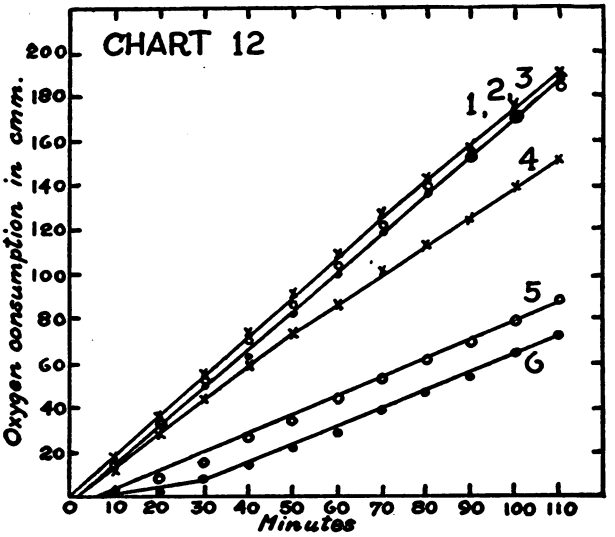

CHART 12.—The effects of methemoglobin and oxyhemoglobin on the action of cyanide. Curves 1, 2, and 3, 0.2 gm. rat testis, testis+N/2,000 methemoglobin, and testis+N/2,000 oxyhemoglobin; Curve 4, testis +N/2,000 methemoglobin, N/3,000 cyanide added immediately after; Curve 5, testis+N/2,000 oxyhemoglobin, N/3,000 cyanide added immediately after; Curve 6, testis+N/3,000 sodium cyanide. Very little antagonism from oxyhemoglobin; marked effect from methemoglobin

has been stated by Müller (19). The inability of hemin to overcome the cyanide action on tissues, therefore, can not be explained upon a basis of lack of combination of hemin with cyanide, unless the cyanide is easily dissociated from cyanhematin.

Another factor which may enter into this behavior of hemin is its low solubility at physiological pH. Methemoglobin and oxyhemoglobin are compounds of hemin and reduced hemin, respectively, and both are easily soluble in the physiological pH range. Furthermore, Zeynek (20) found that a crystalline cyanhemoglobin can be obtained readily by the addition of cyanide to methemoglobin. This reaction proceeds very rapidly. Oxyhemoglobin reacts much more

slowly with cyanide. Recently, Anson and Mirsky (21) subjected the action of cyanide upon globin hemochromogen to a detailed analysis; they showed that definite cyanide compounds are formed, depending upon the conditions. These facts made it desirable to study the theoretically possible antagonistic action of methemoglobin and oxyhemoglobin upon the effect of cyanide on the oxygen uptake of tissues. Chart 12 indicates that methemoglobin partly counteracts the cyanide effect upon testis and that oxyhemoglobin is much less effective. These results substantiate the evidence that the action of cyanide in the higher animals is primarily upon the tissues and not on the blood pigment.

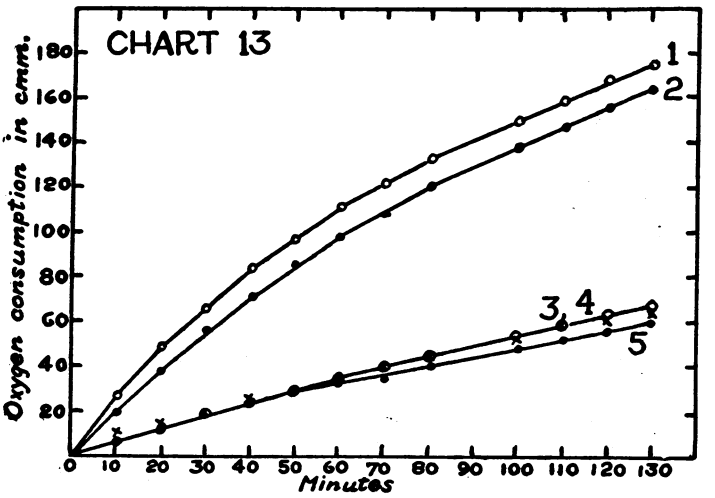

CHART 13.—The inability of S-S glutathione to influence the action of cyanide on oxygen consumption. Curve 1, 0.3 gm. rat testis+N/100 S-S glutathione; Curve 2, testis alone; Curve 3, testis+N/100 S-S glutathione, N/1,000 cyanide added immediately after; Curve 4, testis+N/1,000 cyanide, N/100 S-S glutathione added 40 minutes later; Curve 5, testis+N/1,000 cyanide

Experiments with glutathione revealed no effect on the inhibition of respiration by cyanide. Both oxidized and reduced glutathione were studied, added either before or after cyanide, to rat testes. The cyanide inhibition was not influenced by glutathione in a ratio of CN to SH of 1 to 10. (Charts 13 and 14.) An appreciable diminution in the cyanide effect can be obtained, however, by allowing a solution of cyanide and S–S glutathione to stand for two hours at room temperature before it is added to the tissue. (Chart 15.)

In view of the evident relation of sulphur compounds to the detoxication of cyanide in the animal body, it was of interest to study the action of compounds in which the cyanide radical is part of a complex ion or molecule. Doctor Johnson prepared, by the action

of NaCN on cystine, α-amino-β-sulphocyanopropionic acid. Chart 16 shows the absence of any influence of this substance on the rate of oxygen consumption of testis.

Likewise, potassium sulphocyanate, in a concentration of N/1,000 did not inhibit the oxygen uptake of rat testes. Indeed, this compound caused a definite increase in rate of oxygen uptake with a maximum effect in concentrations of N/500 and N/1,000. (Chart 17.) Further studies are being carried out on this acceleration of oxygen consumption by sulphocyanate.

Potassium cyanate was without effect on the oxygen uptake of the testes (Chart 17), which agrees with the low toxicity, as we have previously shown (15) that KCN is more than thirty-two times as toxic for the rat as KCNO.

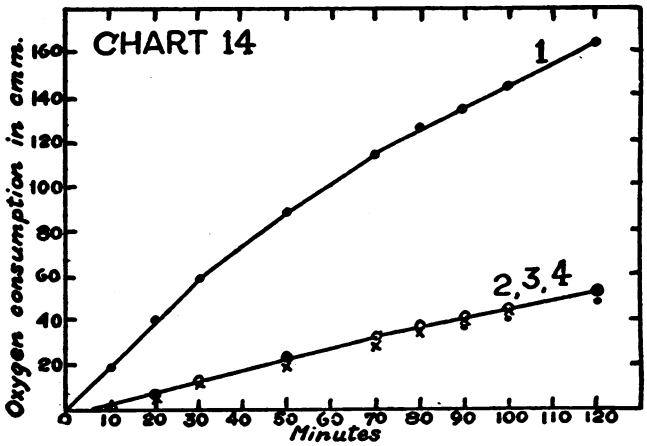

CHART 14.—The inability of SH-glutathione to influence the action of cyanide. Curve 1, 0.3 gm. rat testis; Curve 2, testis+N/100 SH-glutathione N/1,000 cyanide added immediately after; Curve 3, testis+N/1,000 cyanide, N/100 SH-glutathione added 30 minutes later; Curve 4, testis+N/1,000 cyanide

Our experiments demonstrating an antagonism between iron and cyanide are interesting because they represent the first instance of a *biological* antagonism. They are particularly significant because Voegtlin, Rosenthal, and Johnson (22) have shown that under similar conditions no such antagonism exists between arsenoxide and iron. On the other hand, glutathione was very effective against arsenoxide, while it is without effect on cyanide inhibition, unless the glutathione and cyanide are permitted to interact for several hours before addition to the tissues. In other words, a biological antagonism has been demonstrated between arsenoxide and glutathione and not between arsenoxide and iron, while cyanide was antagonized by certain iron compounds but not by glutathione except under special conditions.

MECHANISM OF THE CYANIDE ACTION

From a consideration of all the known facts concerning the action of cyanide upon living organisms, it will be obvious that the chemical action of this poison with the chemical components of the tissues is of a fairly complex nature. The following reactions may occur:

(1) Cyanide may react with the respiration enzyme to form a cyanide-enzyme complex, which no longer can function as biological oxidation catalyst; (2) cyanide may react with iron compounds

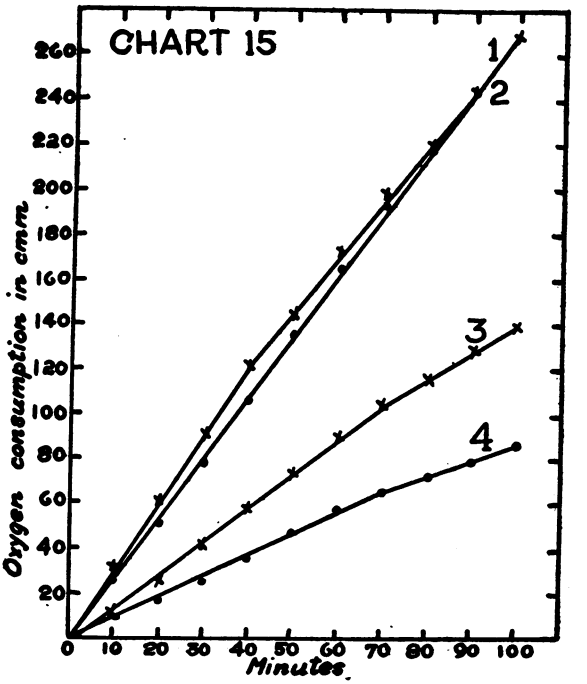

CHART 15.—The ability of S-S glutathione to diminish the action of cyanide if the solutions are mixed and allowed to stand for some time before addition to tissues. Curve 1, 0.3 gm. testis+a solution of S-S glutathione (N/200 final concentration) that had stood at 25° C. for two hours; Curve 2, testis alone; Curve 3, testis+a mixture of N/200 S-S glutathione with N/2,000 cyanide that had stood for two hours; Curve 4, testis+N/2,000 cyanide that had stood for two hours

other than the respiration enzyme with cyanide-iron complex formation; (3) cyanide may react with organic sulphur compounds, yielding cyanide complexes of much lower or qualitatively different physiological activity than cyanide.

It is reasonable to assume that the interaction between cyanide and the various components of organisms is governed at least partly by the relative chemical affinity of the cyanide for these chemical components, and partly by the relative masses of these chemical components actually present in the organisms.

On chemical grounds it seems difficult to assume for instance that cyanide reacts exclusively with the respiration enzyme. Warburg (2) states that the amount of respiration enzyme in living cells is extremely small. For instance, 100 kilos of yeast contain only about 1 milligram. If we assume that the chemical affinity of cyanide for the respiration enzyme is of a reasonable order of magnitude, why is it that to suppress the oxygen consumption of tissues we must employ, according to Alt (17), for about 20 milligrams of tissue suspended in 2.5 c. c. of solution, a cyanide concentration of N/100? A simple calculation will reveal that under these conditions the amount of cyanide

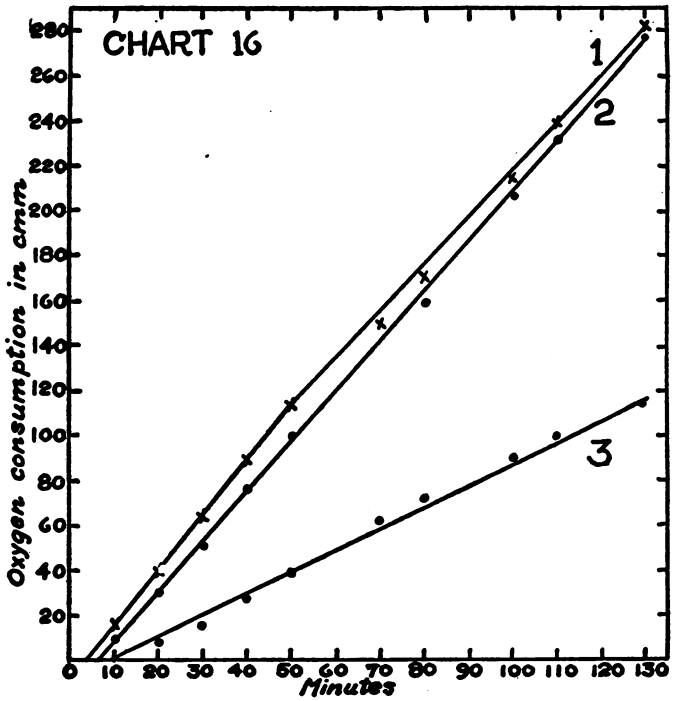

CHART 16.—The absence of toxic effect of a crystalline compound of cyanide and cysteine on oxygen consumption. Curve 1, 0.3 gm. testis+N/3,000 α-amino-β-sulphocyano-proprionic acid; Curve 2, testis alone; Curve 3, testis+N/3000 sodium cyanide

is enormous compared with the amount of respiration enzyme. It is difficult to explain this result on the assumption that the cyanide reacts very slowly on living organisms. All the known pharmacological and biochemical data speak for a very rapid action. We are therefore forced to conclude that cyanide reacts not only with the respiration enzyme, but with other iron compounds and also with sulphur compounds of living organisms. Whether the cyanide effect on the oxygen consumption of tissues is entirely due to the chemical action of cyanide upon the respiration enzyme is still a problem which has not been conclusively solved. The specificity of the action of CO on the

respiration enzyme rests on a much firmer foundation of experimental facts. Furthermore, it is evident that the detoxication of cyanide by living organisms involves chemical reactions of cyanide with such

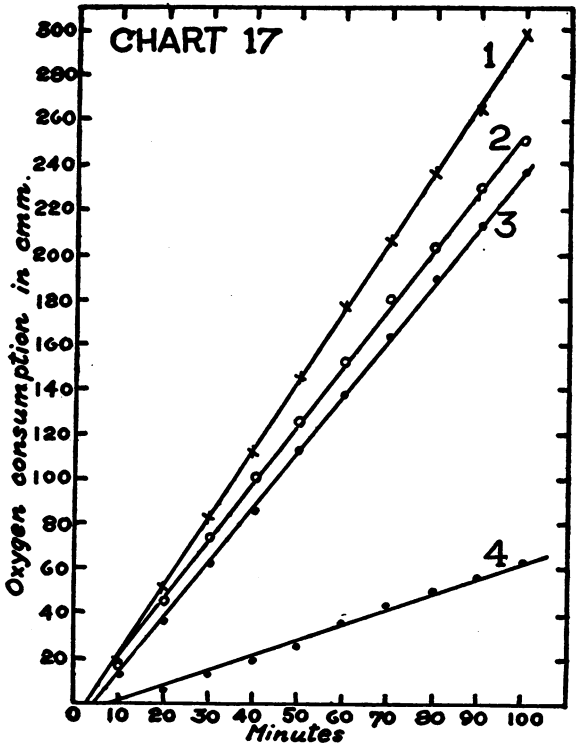

CHART 17.—The nontoxicity of potassium cyanate and potassium sulphocyanate. Curve 1, 0.3 gm. testis+N/1,000 KCNS; Curve 2, testis+N/1,000 KCNO; Curve 3, testis alone; Curve 4, testis+N/1,000 NaCN. A slight acceleration of oxygen consumption resulted from the addition of the sulphocyanate

substances as glutathione (and possibly cysteine, cystine, and sulphur-containing proteins) and iron compounds other than the respiration enzyme.

CONCLUSIONS

1. Glutathione, either in the oxidized or reduced form, when added to various tissues or to yeast cells, does not accelerate the rate of oxygen consumption.

2. Under the conditions of these experiments, rat liver, brain, testicle, Jensen sarcoma, and chicken erythrocytes, are able to keep SH glutathione in the reduced state. The addition of considerable quantities of cysteine and iron to these tissues does not overcome this property. Cysteine is also kept reduced by these tissues, even in the presence of added iron.

3. Rat kidney permits the slow oxidation of glutathione and cysteine.

4. Blood serum causes a marked acceleration in the rate of oxidation of glutathione.

5. Hemin, sodium ferric tartrate, or ferrous ammonium sulphate cause no acceleration of the oxygen consumption of rat tissues or yeast cells.

6. Methemoglobin, sodium ferric tartrate, and ferrous ammonium sulphate are able to prevent part of the inhibition of oxygen uptake caused by sodium cyanide. Oxyhemoglobin is less effective, while hemin shows no effect.

7. Neither oxidized nor reduced glutathione influence the inhibition of respiration by cyanide. However, a slight antagonism can be demonstrated if S–S glutathione and cyanide are allowed to react for a considerable time before they are added to the tissue.

8. Potassium cyanate and a crystalline compound, obtained from cystine and cyanide (α-amino-β-sulphopropionic acid), do not inhibit the oxygen consumption of rat testes. Potassium sulphocyanate causes a slight increase in the rate of oxygen consumption of rat testes.

9. The significance of these results with respect to the mechanism of the action of cyanide upon living cells has been discussed.

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COURT DECISION RELATING TO PUBLIC HEALTH

Ordinance prohibiting slaughterhouses in city upheld.—(Texas Court of Civil Appeals; Sitterle, Mayor, et al. *v.* Victoria Cold Storage Co., 33 S. W. (2d) 546; decided Oct. 22, 1930; rehearing denied Dec. 17, 1930.) The city of Victoria, by ordinance, prohibited the use in the city of establishments for the slaughtering of cattle, hogs, sheep, goats, turkeys, chickens, ducks, geese, and other poultry, and declared places used for slaughtering to be nuisances. A penalty for the maintenance of such a nuisance was prescribed. By statute the city had the power to "abate and prohibit within the city limits slaughtering establishments," to "define all nuisances and prohibit the same within the city," and "to abate and remove nuisances and to punish the authors thereof by fine." At the time that the ordinance was enacted, the appellee operated a poultry slaughterhouse in the city. In a proceeding questioning the validity of the ordinance, the trial court held the ordinance to be void upon its face and by its own terms as a matter of law, refusing to hear any evidence in the case touching upon the questions of the location or manner or effect of operating appellee's slaughterhouse or of the reasonableness of or necessity for the ordinance. The court of civil appeals, in reversing the judgment of the lower court, pointed out that the legislature had delegated to the city the express power to prohibit and abate the operation of slaughtering establishments within the city, and then proceeded to say:

> The power being expressly granted by the legislature, the time for assuming and the manner of exercising it rest within the sound discretion of the governing board of the municipality. Under such authority, the board may determine the questions of the necessity of exercising the power, and of the method of giving effect thereto, and its determination of those questions is final and conclusive, and may not be revised by the courts, in the absence of clear and conclusive evidence that the board had acted arbitrarily and without reason. And in such situation the burden rests upon those aggrieved to make such showing. * * * * * * The presumption of law is that the council acted timely and reasonably, and its action can not be questioned by the courts, unless it appears conclusively that it acted arbitrarily and without the semblance of reason.

The court held that the ordinance was "valid upon its face" and could "be stricken down through the courts only by a clear and conclusive showing that the city council had exceeded its discretion under expressly granted powers" and had "acted arbitrarily and without reason."

DEATHS DURING WEEK ENDED FEBRUARY 14, 1931

Summary of information received by telegraph from industrial insurance companies for the week ended February 14, 1931, and corresponding week of 1930. (From the Weekly Health index, issued by the Bureau of the Census, Department of Commerce)

	Week ended February 14, 1931	Corresponding week, 1930
Policies in force	75, 151, 201	75, 472, 681
Number of death claims	15, 397	13, 971
Death claims per 1,000 policies in force, annual rate	10. 7	9. 7

Deaths[1] from all causes in certain large cities of the United States during the week ended February 14, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

[The rates published in this summary are based upon mid-year population estimates derived from the 1930 census]

City	Week ended Feb. 14, 1931				Corresponding week, 1930		Death rate[2] for the first 7 weeks	
	Total deaths	Death rate[2]	Deaths under 1 year	Infant mortality rate[3]	Death rate[2]	Deaths under 1 year	1931	1930
Total (81 cities)	9,585	14. 0	894	[4] 71	13. 4	832	14. 2	13. 2
Akron	43	8. 7	5	49	9. 6	8	8. 4	9. 0
Albany[5]	56	22. 6	3	59	17. 6	8	15. 3	16. 6
Atlanta	75	14. 1	8	82	20. 9	14	16. 2	17. 6
White	41		4	63		7		
Colored[5]	34	(6)	4	115	(6)	7	(6)	(6) 4
Baltimore[5]	304	19. 5	18	61	15. 4	14	17. 9	15.
White	230		13	56		10		
Colored	74	(6)	5	78	(6)	4	(6)	(6)
Birmingham	62	12. 0	4	40	13. 4	7	14. 7	14. 3
White	30		2	34		2		
Colored	32	(6)	2	49	(6)	5	(6)	(6)
Boston	305	20. 3	25	71	16. 8	35	17. 9	15. 6
Bridgeport	32	11. 3	3	50	14. 9	5	14. 0	14. 4
Buffalo	176	15. 8	18	74	12. 9	20	14. 7	14. 1
Cambridge	41	18. 7	1	20	17. 0	6	15. 0	14. 3
Camden	38	16. 7	3	52	12. 7	7	18. 7	14. 6
Canton	29	14. 2	3	69	10. 9	4	11. 0	11. 7
Chicago[5]	860	13. 0	66	58	11. 8	66	12. 5	11. 6
Cincinnati	146	16. 6	9	54	14. 6	4	17. 7	17. 1
Cleveland	231	13. 2	25	73	12. 5	17	11. 4	12. 3
Columbus	81	14. 3	6	59	12. 5	8	14. 2	14. 8
Dallas	68	13. 0	10		12. 9	9	12. 8	13. 9
White	52		7			7		
Colored	16	(6)	3		(6)	2	(6)	(6)
Dayton	50	12. 6	5	70	11. 1	2	13. 0	10. 6
Denver	86	15. 4	5	48	13. 9	7	16. 1	15. 3
Des Moines	37	13. 3	4	70	11. 3	0	12. 7	13. 5
Detroit	369	11. 6	50	80	10. 1	55	9. 1	10. 2
Duluth	14	7. 2	3	74	10. 3	3	11. 6	11. 7
El Paso	30	14. 9	3		24. 3	13	21. 1	20. 3
Erie	33	14. 6	3	56	12. 6	3	11. 1	11. 9
Fall River[5 7]	36	16. 3	7	159	13. 6	4	13. 2	13. 1
Flint	15	4. 8	3	38	10. 6	8	7. 5	9. 8
Fort Worth	27	8. 4	1		11. 8	4	11. 9	13. 0
White	18		1			4		
Colored	9	(6)	0		(6)	0	(6)	(6)
Grand Rapids	29	8. 8	2	30	13. 6	4	9. 8	10. 8
Houston	73	12. 3	4		12. 7	6	12. 2	13. 3
White	41		3			3		
Colored	32	(6)	1		(6)	3	(6)	(6)
Indianapolis	120	16. 9	9	74	17. 4	1	15. 0	16. 9
White	93		8	75		1		
Colored	27	(6)	1	67	(6)	0	(6)	(6)
Jersey City	85	13. 9	13	115	16. 3	13	14. 6	12. 9
Kansas City, Kans	38	16. 1	5	103	11. 5	3	15. 9	12. 9
White	32		5	123		3		
Colored	6	(6)	0	0	(6)	0	(6)	(6)
Kansas City, Mo	130	16. 6	12	91	14. 4	13	15. 0	14. 3
Knoxville	26	12. 4	5	107	19. 1	4	14. 1	15. 0
White	17		4	95		4		
Colored	9	(6)	1	204	(6)	0	(6)	(6)
Long Beach	37	12. 7	1	24	4. 7	0	11. 5	10. 7
Los Angeles	257	10. 2	25	73	11. 0	19	12. 7	12. 7
Louisville	85	14. 4	13	111	16. 8	6	17. 4	15. 0
White	67		10	98		5		
Colored	18	(6)	3	199	(6)	1	(6)	(6)

Footnotes at end of table.

Deaths[1] from all causes in certain large cities of the United States during the week ended February 14, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930—Continued.

City	Week ended Feb. 14, 1931				Corresponding week, 1930		Death rate[2] for the first 7 weeks	
	Total deaths	Death rate[2]	Deaths under 1 year	Infant mortality rate[3]	Death rate[2]	Deaths under 1 year	1931	1930
Lowell[7]	27	14.0	4	102	15.0	3	15.1	14.6
Lynn	21	10.7	1	26	14.3	3	13.3	12.5
Memphis	47	9.5	5	53	20.7	5	17.2	17.3
White	23		2	33		2		
Colored	24	(6)	3	87	(6)	3	(6)	(6)
Miami	34	15.8	1	25	12.2	2	14.0	12.7
White	29		1	35		2		
Colored	5	(6)	0	0	(6)	0	(6)	(6)
Milwaukee	145	12.8	19	82	10.8	19	10.4	10.6
Minneapolis	117	12.9	11	71	10.2	9	12.5	11.8
Nashville	45	15.1	6	89	15.6	4	16.8	17.0
White	28		2	40		2		
Colored	17	(6)	4	236	(6)	2	(6)	(6)
New Bedford[7]	37	17.1	2	53	10.2	2	13.8	11.5
New Haven	37	11.9	2	38	12.5	2	13.1	15.0
New Orleans	181	20.2	15	82	20.5	20	21.2	20.5
White	99		8	66		5		
Colored	82	(6)	7	114	(6)	15	(6)	(6)
New York	1,739	12.8	138	66	12.0	146	14.5	11.9
Bronx Borough	220	9.0	22	50	8.0	13	10.4	8.4
Brooklyn Borough	629	12.5	58	61	11.1	56	13.7	11.0
Manhattan Borough	656	18.8	61	104	17.7	59	21.7	17.8
Queens Borough	186	8.4	15	41	8.5	13	9.8	7.9
Richmond Borough	38	12.1	2	36	17.0	5	14.4	14.9
Newark, N. J	134	15.7	14	73	16.5	12	14.9	14.5
Oakland	46	8.2	4	51	10.8	4	12.1	12.8
Oklahoma City	41	10.9	7	97	12.5	3	11.5	10.1
Omaha	59	14.2	4	45	14.3	1	15.3	14.6
Paterson	40	15.6	4	69	15.4	2	15.3	12.8
Philadelphia	602	16.0	57	83	14.8	61	16.8	13.5
Pittsburgh	262	20.2	40	138	16.9	22	17.3	15.3
Portland, Oreg	69	11.7	5	61	16.2	3	13.2	14.9
Providence	85	17.4	7	65	15.0	4	15.7	15.8
Richmond	60	17.0	6	87	17.1	2	17.7	16.5
White	36		3	66		1		
Colored	24	(6)	3	130	(6)	1	(6)	(6)
Rochester	97	15.2	8	73	13.5	4	13.4	12.1
St. Louis	382	24.1	39	131	16.8	11	18.1	15.1
St. Paul	51	9.6	5	62	10.7	3	10.7	11.9
Salt Lake City[8]	28	10.2	1	15	14.1	3	13.3	14.4
San Antonio	60	13.0	11		17.7	7	15.7	20.2
San Diego	41	13.7	2	41	17.1	2	16.7	16.5
San Francisco	144	11.6	9	60	12.8	4	14.5	14.5
Schenectady	18	9.8	1	29	9.8	0	10.5	10.3
Seattle	79	11.1	5	47	10.0	4	12.5	11.6
Somerville	29	14.4	3	112	14.5	2	11.4	12.9
South Bend	22	10.6	5	125	7.9	0	7.9	9.2
Spokane	23	10.3	3	78	15.8	2	13.3	13.5
Springfield, Mass	45	15.4	3	46	15.3	4	14.3	14.8
Syracuse	56	13.7	10	119	12.7	5	13.4	13.2
Tacoma	27	13.1	4	103	15.1	0	14.7	12.2
Toledo	82	14.5	5	46	15.2	5	12.7	14.2
Trenton	42	17.7	5	87	22.8	9	19.9	18.0
Utica	28	14.3	1	26	10.8	4	16.2	14.9
Washington D. C	177	18.7	7	39	15.9	11	18.7	16.2
White	122		2	16		5		
Colored	55	(6)	5	86	(6)	6	(6)	(6)
Waterbury	24	12.4	2	60	12.0	3	11.4	10.6
Wilmington, Del.[7]	55	26.9	2	43	23.5	4	17.3	16.3
Worcester	57	15.1	1	14	20.0	10	16.0	14.7
Yonkers	27	10.1	6	157	11.5	3	11.3	9.1
Youngstown	39	11.8	4	56	12.2	3	10.9	10.9

[1] Deaths of nonresidents are included. Stillbirths are excluded.
[2] These rates represent annual rates per 1,000 population, as estimated for 1931 and 1930 by the arithmetical method.
[3] Deaths under 1 year of age per 1,000 live births. Cities left blank are not in the registration area for births.
[4] Data for 76 cities.
[5] Deaths for week ended Friday.
[6] For the cities for which deaths are shown by color, the percentage of colored population in 1920 was as follows: 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; Miami, 31; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.
[7] Population Apr. 1, 1930; decreased 1920 to 1930, no estimate made.

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 21, 1931, and February 22, 1930

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 21, 1931, and February 22, 1930

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930
New England States:								
Maine	2	3	105	26	23	10	0	0
New Hampshire	----	1	----	4	42	36	0	0
Vermont	----	2	4	----	9	7	0	0
Massachusetts [2]	56	75	130	6	579	447	3	3
Rhode Island	2	18	6	----	1	3	0	0
Connecticut	12	20	105	10	414	13	1	2
Middle Atlantic States:								
New York	115	130	[1] 180	[1] 39	983	575	18	17
New Jersey	65	86	123	15	815	445	1	7
Pennsylvania	94	161	----	----	2,254	781	13	14
East North Central States:								
Ohio	27	28	95	19	184	515	4	3
Indiana	34	38	74	----	699	29	7	23
Illinois	124	171	273	25	1,291	674	9	6
Michigan	37	67	269	17	137	482	4	20
Wisconsin	21	15	152	21	260	951	1	5
West North Central States:								
Minnesota	14	13	7	----	40	292	1	1
Iowa	7	12	----	----	----	732	4	2
Missouri	37	48	206	17	873	112	8	16
North Dakota	13	1	----	----	16	59	0	2
South Dakota	10	1	2	----	15	107	0	1
Nebraska	12	24	2	----	1	484	2	8
Kansas	20	11	107	7	15	437	3	3
South Atlantic States:								
Delaware	2	3	41	----	27	21	0	0
Maryland [2]	31	25	702	35	480	16	2	1
District of Columbia	4	21	12	----	84	15	2	0
West Virginia	11	4	166	28	66	58	2	2
North Carolina	31	37	395	36	466	14	6	9
South Carolina	13	11	4,191	985	164	----	4	3
Georgia	6	8	1,596	92	88	146	2	3
Florida [3]	7	12	133	5	190	76	1	0

[1] New York City only.
[2] Week ended Friday.
[3] Typhus fever, 1931: 2 cases, 1 case in Florida, and 1 case in Alabama.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 21, 1931, and February 22, 1930—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930
East South Central States:								
Kentucky	12	----	31	----	150	----	10	6
Tennessee	3	16	416	133	96	205	2	13
Alabama [3]	41	27	350	120	497	167	7	3
Mississippi	16	16	----	----	----	----	5	22
West South Central States:								
Arkansas	8	5	208	80	15	9	1	2
Louisiana	71	9	159	38	----	118	3	4
Oklahoma [4]	19	23	257	177	32	224	0	5
Texas	32	39	70	292	161	143	0	1
Mountain States:								
Montana	1	1	----	----	5	25	1	0
Idaho	----	2	----	----	1	22	1	2
Wyoming	----	2	6	----	3	13	1	0
Colorado	7	12	----	----	133	170	2	3
New Mexico	5	22	3	5	48	110	2	1
Arizona	5	9	10	14	222	2	4	5
Utah [2]	----	----	10	1	2	160	2	5
Pacific States:								
Washington	5	14	----	----	50	193	0	5
Oregon	15	7	26	80	78	24	0	0
California	53	69	513	34	996	1,151	6	9

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930
New England States:								
Maine	0	0	40	60	0	0	1	2
New Hampshire	0	0	3	19	0	0	0	0
Vermont	0	0	1	8	1	4	0	0
Massachusetts	0	1	399	256	0	0	4	2
Rhode Island	0	0	24	39	0	0	4	0
Connecticut	0	0	55	131	0	0	1	1
Middle Atlantic States:								
New York	3	2	836	461	13	1	7	16
New Jersey	0	1	299	223	0	0	2	0
Pennsylvania	1	0	646	546	0	0	25	18
East North Central States:								
Ohio	1	2	293	284	54	175	6	8
Indiana	0	0	346	261	108	144	1	2
Illinois	0	2	465	604	52	113	2	4
Michigan	0	1	463	305	26	62	5	3
Wisconsin	0	1	143	145	7	36	2	3
West North Central States:								
Minnesota	0	1	97	131	6	5	2	3
Iowa	0	0	167	103	62	80	1	1
Missouri	0	0	328	135	45	76	2	1
North Dakota	0	1	41	28	2	15	1	0
South Dakota	0	0	15	23	36	39	1	0
Nebraska	1	0	51	103	44	67	1	0
Kansas	0	0	80	158	116	68	3	3
South Atlantic States:								
Delaware	0	1	30	16	0	0	0	0
Maryland [2]	0	0	97	113	0	0	1	2
District of Columbia	0	0	14	24	0	0	1	0
West Virginia	0	0	27	45	18	15	2	5
North Carolina	0	1	65	56	2	16	2	2
South Carolina	1	0	22	12	5	1	0	16
Georgia	0	1	72	6	0	0	0	1
Florida [3]	0	0	10	8	0	1	3	1

[2] Week ended Friday.
[3] Typhus fever, 1931: 2 cases; 1 case in Florida, and 1 case in Alabama.
[4] Figures for 1931 are exclusive of Oklahoma City and Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended February 21, 1931, and February 22, 1930—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930	Week ended Feb. 21, 1931	Week ended Feb. 22, 1930
East South Central States:								
Kentucky	0	0	104	62	8	14	0	0
Tennessee	0	1	45	22	6	15	2	6
Alabama [3]	3	1	35	15	12	13	15	1
Mississippi	0	0	24	55	9	2	4	3
West South Central States:								
Arkansas	1	0	24	17	18	14	6	5
Louisiana	2	0	26	20	21	11	8	12
Oklahoma [4]	1	0	23	46	70	150	2	7
Texas	0	0	18	43	28	118	4	9
Mountain States:								
Montana	0	0	62	29	4	2	1	2
Idaho	0	0	11	5	0	2	4	1
Wyoming	0	0	22	15	4	16	0	0
Colorado	0	0	43	28	6	24	2	1
New Mexico	0	0	9	26	7	2	2	0
Arizona	0	0	4	9	2	18	1	10
Utah [2]	0	0	21	6	0	1	0	1
Pacific States:								
Washington	0	0	57	50	22	82	4	14
Oregon	2	0	20	58	20	28	0	1
California	6	0	122	263	68	97	10	7

[2] Week ended Friday.
[3] Typhus fever, 1931: 2 cases; 1 case in Florida, and 1 case in Alabama.
[4] Figures for 1931 are exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December, 1930										
Florida	3	76	9	17	143	2	1	53	1	7
Hawaii Territory	1	26	23	----	30	----	1	3	----	6
Nevada	----	2	15	----	----	----	0	3	----	0
January, 1931										
Colorado	11	36	3	----	344	1	1	201	60	7
Illinois	40	665	815	4	3,032	----	21	2,126	211	23
Louisiana	17	142	427	23	10	32	3	104	38	24
Maine	----	16	58	----	112	----	9	106	0	11
Maryland	2	112	4,905	1	879	1	1	407	0	16
Minnesota	12	62	2	----	133	----	6	288	44	12
Missouri	27	272	300	3	6,002	----	10	987	190	26
New Hampshire	----	10	17	----	----	----	0	23	0	3
New Jersey	24	281	2,066	1	1,715	----	0	1,064	0	10
New Mexico	5	21	8	1	202	2	1	38	8	8
New York	84	553	----	4	1,461	----	10	2,880	29	38
North Carolina	8	160	2,006	----	526	68	5	326	11	16
Ohio	25	292	159	1	867	1	15	2,345	388	42
Oregon	1	26	204	----	380	----	3	95	99	4
Porto Rico	----	35	91	3,674	15	1	----	----	----	28
West Virginia	3	74	429	----	152	----	----	227	65	38

December, 1930

Chicken pox:	Cases
Florida	57
Hawaii Territory	4
Nevada	1
Conjunctivitis:	
Hawaii Territory	16
Dysentery:	
Florida	3
Hawaii Territory (amebic)	1
Hookworm disease:	
Hawaii Territory	14
Leprosy:	
Hawaii Territory	6
Lethargic encephalitis:	
Florida	1
Mumps:	
Florida	23
Hawaii Territory	18
Nevada	2
Tetanus:	
Hawaii Territory	5
Trachoma:	
Hawaii Territory	4
Typhus fever:	
Florida	1
Whooping cough:	
Florida	32
Hawaii Territory	18

January, 1931

Actinomycosis:	
Colorado	1
Anthrax:	
New Jersey	1
New York	1
Chicken pox:	
Colorado	444
Illinois	1,785
Louisiana	50
Maine	396
Maryland	1,040
Minnesota	675
Missouri	583
New Jersey	1,935
New Mexico	83
New York	3,212
North Carolina	1,031
Ohio	2,849
Oregon	247
Porto Rico	12
West Virginia	276
Conjunctivitis:	
Illinois	1
Maine	2
Dengue:	
Porto Rico	2
Dysentery:	
Illinois	10
Illinois (amebic)	1
Louisiana	6
Maine	1
Maryland	1
Minnesota (amebic)	9
New York	10
Ohio	2
Porto Rico	20
Filariasis:	
Porto Rico	6
Food poisoning:	
Ohio	6
German measles:	
Colorado	5
Illinois	35
Maine	12
Maryland	85
New Jersey	49
New York	231
North Carolina	666
Ohio	39
Hookworm disease:	
Louisiana	2
Impetigo contagiosa:	
Colorado	3
Maryland	22
Oregon	32
Jaundice:	
Colorado	8
Maryland	47
Lead poisoning:	
Illinois	14
New Jersey	1
Ohio	7
Lethargic encephalitis:	
Illinois	4
Louisiana	5
Maine	1
Maryland	2
New Jersey	6
New Mexico	1
New York	16
Ohio	4
Oregon	2
Mumps:	
Colorado	163
Illinois	1,433
Louisiana	11
Maine	380
Maryland	147
Missouri	89
New Jersey	154
New Mexico	77
New York	1,222
Ohio	962
Oregon	344
Porto Rico	7
Ophthalmia neonatorum:	
Colorado	1
Illinois	6
Maryland	1
Missouri	4
New Jersey	10
New Mexico	2
New York	7
Ohio	79
Porto Rico	4
Paratyphoid fever:	
Maine	1
New York	2
Ohio	1
Porto Rico	8
Puerperal septicemia:	
Illinois	5
Louisiana	12

Puerperal septicemia—Continued.	Cases
New York	13
Ohio	7
Porto Rico	15
Rabies in animals:	
Louisiana	13
Maryland	4
Missouri	1
New York	10
Scabies:	
Maryland	8
Oregon	23
Septic sore throat:	
Illinois	4
Louisiana	3
Maine	1
Maryland	10
Missouri	22
New York	33
North Carolina	1
Ohio	127
Oregon	4
Tetanus:	
Illinois	1
Louisiana	4
Maryland	3
New Jersey	1
New York	6
Porto Rico	5
Tetanus (infantile):	
Porto Rico	25
Trachoma:	
Illinois	5
Missouri	42
New Jersey	3
New Mexico	1
New York	1
North Carolina	2
Ohio	4
Trichinosis:	
New York	13

Tularaemia:	Cases
Illinois	47
Louisiana	5
Maryland	7
Minnesota	3
Missouri	6
Ohio	50
Typhus fever:	
Maryland	2
North Carolina	1
Undulant fever:	
Illinois	5
Louisiana	3
Minnesota	4
Missouri	8
New Jersey	4
New York	18
Ohio	7
Vincent's angina:	
Colorado	1
Illinois	1
Maine	1
Maryland	9
New Mexico	1
New York [1]	72
Oregon	11
Whooping cough:	
Colorado	153
Illinois	578
Louisiana	75
Maine	503
Maryland	145
Minnesota	147
Missouri	114
New Jersey	699
New Mexico	29
New York	2,095
North Carolina	374
Ohio	413
Oregon	40
Porto Rico	155
West Virginia	209

RECIPROCAL NOTIFICATIONS

Notifications regarding communicable diseases sent during the month of January, 1931, by departments of health of certain States to other State health departments

Disease	California	Connecticut	Illinois	Kansas	Massachusetts	Minnesota	New York	Washington
Diphtheria						1	1	
Leprosy								1
Measles							1	
Pneumonia (lobar)		1						
Scarlet fever		1						
Smallpox							3	
Syphilis				13		2		
Tuberculosis	1		17			2		
Typhoid fever					1		1	
Undulant fever						1		

[1] Exclusive of New York City.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 97 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 33,185,000. The estimated population of the 90 cities reporting deaths is more than 31,640,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended February 14, 1931, and February 15, 1930

	1931	1930	Estimated expectancy
Cases reported			
Diphtheria:			
45 States	1,113	1,393	----------
97 cities	420	592	840
Measles:			
45 States	11,387	10,516	----------
97 cities	3,331	2,558	----------
Meningococcus meningitis:			
47 States	142	285	----------
97 cities	73	100	----------
Poliomyelitis:			
46 States	30	24	----------
Scarlet fever:			
46 States	5,848	5,137	----------
97 cities	2,210	1,893	1,551
Smallpox:			
46 States	943	1,605	----------
97 cities	117	164	57
Typhoid fever:			
46 States	123	187	----------
97 cities	21	35	27
Deaths reported			
Influenza and pneumonia:			
90 cities	1,699	1,129	----------
Smallpox:			
90 cities	0	0	----------

City reports for week ended February 14, 1931

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

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1922 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND								
Maine:								
Portland	20	1	0	13	0	0	7	2
New Hampshire:								
Concord	0	0	0	----------	0	0	0	2
Vermont:								
Barre	0	0	0	----------	0	0	0	0
Burlington	0	1	0	----------	0	0	0	0

City reports for week ended February 14, 1931—Continued

Division, State, and city	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—continued								
Massachusetts:								
Boston	80	37	16	76	7	62	11	66
Fall River	2	4	1	----	0	0	15	4
Springfield	7	4	0	2	2	0	11	6
Worcester	7	3	5	3	1	5	6	5
Rhode Island:								
Pawtucket	5	1	1	----	0	2	1	3
Providence	8	9	7	21	5	1	0	16
Connecticut:								
Bridgeport	4	5	0	22	1	1	3	4
Hartford	11	6	1	14	3	72	1	8
New Haven[1]	14	1	0	5	0	79	14	5
MIDDLE ATLANTIC								
New York:								
Buffalo	32	13	6	7	2	78	60	33
New York	208	200	74	179	49	354	37	308
Rochester	9	7	2	18	0	1	4	11
Syracuse	32	2	2	----	0	15	0	4
New Jersey:								
Camden	6	7	2	5	4	108	1	7
Newark	89	18	5	41	2	7	6	21
Trenton	7	2	1	43	2	0	2	3
Pennsylvania:								
Philadelphia	157	6	17	59	35	151	35	89
Pittsburgh	58	22	10	23	15	65	25	85
Reading	12	2	0	----	0	110	43	7
EAST NORTH CENTRAL								
Ohio:								
Cincinnati	16	8	2	5	3	82	30	11
Cleveland	152	33	7	400	8	3	116	29
Columbus	21	3	4	2	4	5	2	11
Toledo	44	5	4	3	1	2	16	10
Indiana:								
Fort Wayne	2	3	3	----	0	34	0	9
Indianapolis	46	8	11	----	3	33	7	24
South Bend	0	2	2	----	0	0	0	2
Terre Haute	4	1	0	----	1	0	0	3
Illinois:								
Chicago	104	99	81	98	54	44	65	130
Springfield	17	1	0	4	0	59	0	2
Michigan:								
Detroit	96	48	29	150	11	5	24	52
Flint	21	2	0	19	1	0	10	3
Grand Rapids	9	1	0	3	0	0	1	2
Wisconsin:								
Kenosha	19	1	0	17	0	1	16	1
Madison	43	1	9	----	----	3	34	----
Milwaukee	115	17	1	16	7	30	287	18
Racine	8	2	0	2	0	5	0	0
Superior	27	1	0	----	0	0	0	3
WEST NORTH CENTRAL								
Minnesota:								
Duluth	11	0	0	12	0	0	3	1
Minneapolis	71	19	1	----	2	35	76	13
St. Paul	63	6	0	----	2	1	1	3
Iowa:								
Davenport	1	1	0	----	----	0	0	1
Des Moines	1	2	0	----	----	0	2	----
Sioux City	18	1	0	0	----	1	13	----
Waterloo	1	0	0	----	----	0	0	----
Missouri:								
Kansas City	63	5	5	8	3	84	1	21
St. Joseph	6	1	2	----	1	1	0	1
St. Louis	19	41	14	37	11	561	15	----

[1] The report of 4 cases of diphtheria in New Haven, Conn., for the week ended Jan. 17, 1931 (Public Health Reports, Feb. 6, 1931, p. 307) is erroneous. No case of diphtheria occurred in New Haven during that week.

City reports for week ended February 14, 1931—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
WEST NORTH CENTRAL—continued								
North Dakota:								
Fargo	8	0	0	1	0	1	10	2
Grand Forks	2	1	0			0	5	
South Dakota:								
Aberdeen	1	0	0			2	0	
Sioux Falls	0	1	0			0	0	
Nebraska:								
Omaha	15	5	5		0	0	1	1
Kansas:								
Topeka	26	2	1		0	3	17	0
Wichita	14	4	1		0	0	0	0
SOUTH ATLANTIC								
Delaware:								
Wilmington	2	2	1		2	12	0	12
Maryland:								
Baltimore	180	25	13	282	17	361	20	62
Cumberland	1	1	0	9	0	5	0	4
Frederick	0	0	0		0	0	0	0
District of Columbia:								
Washington	46	19	5	15	8	48	0	28
Virginia:								
Lynchburg	20	1	0		2	2	1	1
Norfolk	7	1	0		0	1	0	0
Richmond	1	4	1		7	233	0	0
Roanoke	2	1	2		0	0	0	1
West Virginia:								
Charleston	6	0	0	3	0	0	4	0
Wheeling	12	1	0		0	0	0	0
North Carolina:								
Raleigh	3	1	0		2	13	0	3
Wilmington	13	0	1	4	0	1	0	4
Winston-Salem	7	1	0	16	1	0	0	7
South Carolina:								
Charleston	5	0	4	310	4	73	8	13
Columbia	1	0	1		0	1	4	21
Greenville	1	0	0		0	1	1	
Georgia:								
Atlanta	5	4	1	668	10	54	0	11
Brunswick	1	0	0		0	0	14	1
Savannah	1	1	1	66	6	0	8	5
Florida:								
Miami	14	2	3	5	3	1	0	0
St. Petersburg		0			0			1
Tampa	6	2	0	2	1	117	4	3
EAST SOUTH CENTRAL								
Kentucky:								
Covington	0	1	0	1	1	2	2	1
Tennessee:								
Memphis	75	4	3	0	2	16	3	8
Nashville	3	1	1		2	17	0	6
Alabama:								
Birmingham	9	3	2	7	1	119	1	8
Mobile	9	1	3	30	4	0	1	3
Montgomery	30	1	0	6		0	0	
WEST SOUTH CENTRAL								
Arkansas:								
Fort Smith	4	1	0			0	0	
Little Rock	1	1	0		0	0	0	0
Louisiana:								
New Orleans	10	15	12	14	16	0	0	16
Shreveport	12	0	2		0	0	0	6
Oklahoma:								
Muskogee	5	0	2	11		1	3	
Tulsa	7	2	2			1	0	
Texas:								
Dallas	44	6	6		0	2	2	7
Fort Worth	3	4	5		1	0	0	4
Galveston	2	1	1		0	0	0	6
Houston	12	6	8		5	0	2	5
San Antonio	2	3	6		25	3	0	11

City reports for week ended February 14, 1931—Continued

Division, State, and city	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								
Montana:								
Billings	6	0	0		0	0	0	0
Great Falls	3	1			0	0	0	2
Helena	0	0	0		0	0	0	0
Missoula	0	0	0		0	0	0	2
Idaho:								
Boise	3	0	0		0	0	0	2
Colorado:								
Denver		9						
Pueblo	2	1	0		0	67	0	1
New Mexico:								
Albuquerque	5	0	0		0	0	0	3
Arizona:								
Phoenix	1	0	0		1	0	0	4
Utah:								
Salt Lake City	11	2	0		0	0	5	2
Nevada:								
Reno	0	0	2		0	0	0	2
PACIFIC								
Washington:								
Seattle	22	4	3			2	30	
Spokane	13	3	1			10	0	
Tacoma	12	1	1		0	0	1	3
Oregon:								
Portland	17	7	5		0	15	16	6
Salem	0	0	0		0	8	24	0
California:								
Los Angeles	85	42	10	112	1	66	11	14
Sacramento	32	2	3	3	2	2	7	3
San Francisco	67	16	7	86	3	6	2	10

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	4	19	0	0	0	0	0	0	0	26	37
New Hampshire:							4				
Concord	0	0	0	0	0	0	0	0	0	0	6
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	10	2
Burlington	1	1	0	0	0	0	0	0	0	0	8
Massachusetts:											
Boston	84	141	0	0	0	16	0	1	0	47	305
Fall River	3	13	0	0	0	7	0	0	0	4	36
Springfield	10	9	0	0	0	1	0	0	0	1	37
Worcester	10	32	0	0	0	4	0	0	0	4	57
Rhode Island:											
Pawtucket	2	29	0	0	0	0	0	0	0	1	
Providence	13	24	0	0	0	2	0	0	0	0	85
Connecticut:											
Bridgeport	11	7	0	0	0	1	0	0	0	0	32
Hartford	7	8	0	0	0	2	0	0	0	2	31
New Haven	10	2	0	0	0	1	0	0	0	2	37
MIDDLE ATLANTIC											
New York:											
Buffalo	30	29	0	0	0	10	0	0	0	17	175
New York	280	315	0	0	0	91	6	2	1	128	1,718
Rochester	9	94	0	0	0	0	0	0	0	12	95
Syracuse	14	7	0	0	0	3	0	0	0	6	56

City reports for week ended February 14, 1931—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		
MIDDLE ATLANTIC—continued											
New Jersey:											
Camden	7	5	0	0	0	1	0	0	0	0	38
Newark	47	38	0	0	0	12	0	0	0	34	140
Trenton	6	14	0	0	0	6	1	2	0	1	42
Pennsylvania:											
Philadelphia	103	183	0	0	0	36	1	0	0	28	602
Pittsburgh	34	31	0	0	0	11	1	0	0	13	262
Reading	5	3	0	0	0	4	0	0	0	0	38
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	22	37	1	0	0	10	1	0	0	4	146
Cleveland	53	101	0	0	0	17	0	1	1	19	231
Columbus	12	13	1	0	0	3	0	0	0	0	81
Toledo	14	7	1	10	0	9	0	0	0	2	82
Indiana:											
Fort Wayne	5	8	0	0	0	3	0	0	0	0	27
Indianapolis	11	60	6	12	0	4	1	0	0	26	
South Bend	4	1	0	0	0	1	0	0	0	8	22
Terre Haute	3	1	1	0	0	2	0	0	0	0	15
Illinois:											
Chicago	139	224	2	0	0	41	2	0	0	47	860
Springfield	3	6	0	0	0	2	0	0	0	0	26
Michigan:											
Detroit	121	109	3	2	0	29	1	0	0	54	369
Flint	16	16	1	0	0	3	0	0	0	7	15
Grand Rapids	13	15	1	3	0	1	0	0	0	8	29
Wisconsin:											
Kenosha	2	2	0	0	0	0	0	0	0	0	3
Madison	3	4	0	0			0	0		7	
Milwaukee	36	17	1	0	0	8	0	0	0	26	145
Racine	5	5	0	0	0	0	0	0	0	11	18
Superior	4	3	0	0	0	2	0	0	0	0	9
WEST NORTH CENTRAL											
Minnesota:											
Duluth	10	1	0	0	0	0	0	0	0	0	14
Minneapolis	53	24	0	0	0	2	0	0	0	20	117
St. Paul	34	7	4	0	0	1	1	0	0	10	
Iowa:											
Davenport	1	0	2	11			0	0		0	
Des Moines	13	6	2	16			0	0		1	37
Sioux City	2	18	0	0			0	0		1	
Waterloo	3	1	0	0			0	0		8	
Missouri:											
Kansas City	19	13	0	0	0	7	1	0	0	7	130
St. Joseph	3	7	0	0	0	1	0	1	0	2	21
St. Louis	37	155	2	2	0	18	0	0	0	9	382
North Dakota:											
Fargo	3	3	0	0	0	1	0	0	0	0	11
Grand Forks	1	0	1	0			0	0		1	
South Dakota:											
Aberdeen	1	1	0	0			0	0		0	
Sioux Falls	2	0	1	5			0	0		0	10
Nebraska:											
Omaha	6	16	1	22	0	0	0	0	0	2	59
Kansas:											
Topeka	2	2	0	0	0	0	0	0	0	0	11
Wichita	6	1	0	20	0	3	0	0	0	1	25
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	15	0	0	0	2	0	0	0	1	55
Maryland:											
Baltimore	39	39	0	0	0	19	1	0	0	16	304
Cumberland	1	2	0	0	0	0	0	0	0	0	11
Frederick	1	7	0	0	0	0	0	0	0	0	4

City reports for week ended February 14, 1931—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											
District of Col.:											
Washington	26	25	0	0	0	15	1	0	0	2	177
Virginia:											
Lynchburg	0	1	0	0	0	0	0	0	0	0	13
Norfolk	2	8	0	0	0	2	0	0	0	5	
Richmond	4	10	0	0	0	4	1	0	0	0	69
Roanoke	1	4	0	0	0	0	0	0	0	1	15
West Virginia:											
Charleston	2	1	1	0	0	0	1	0	0	1	23
Wheeling	2	3	0	0	0	1	1	0	0	1	15
North Carolina:											
Raleigh	1	1	0	0	0	1	0	0	0	9	21
Wilmington	0	3	1	0	0	2	0	0	0	2	16
Winston-Salem	2	1	0	0	0	1	0	0	0	0	27
South Carolina:											
Charleston	1	2	0	0	0	3	0	0	0	0	41
Columbia	0	0	0	0	0	1	0	0	0	0	48
Greenville	0	0	0	0	0	0	0	0	0	0	
Georgia:											
Atlanta	6	46	2	0	0	1	0	0	0	1	75
Brunswick	0	0	0	0	0	0	0	0	0	0	2
Savannah	0	0	0	0	0	0	0	0	1	0	37
Florida:											
Miami	2	0	0	0	0	1	0	0	0	3	34
St. Petersburg	0		0		0	0	0		0		23
Tampa	1	2	0	0	0	3	1	0	0	1	30
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	8	0	0	0	1	0	0	0	1	24
Tennessee:											
Memphis	8	35	0	2	0	1	0	5	0	0	47
Nashville	2	7	0	0	0	2	0	0	0	3	45
Alabama:											
Birmingham	3	9	1	0	0	3	0	0	0	9	62
Mobile	0	2	0	0	0	1	0	0	1	0	25
Montgomery	0	4	0	0			0	0		1	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	4	0	0			0	0		2	
Little Rock	2	2	0	3	0	1	0	0	0	0	
Louisiana:											
New Orleans	8	20	0	13	0	25	2	1	0	0	181
Shreveport	1	2	0	10	0	4	0	0	0	0	36
Oklahoma:											
Muskogee	1	1	3	3	0	0	0	0	0	0	
Tulsa	2	5	2	6			0	1		0	
Texas:											
Dallas	5	3	3	2	0	6	1	2	0	8	68
Fort Worth	4	3	2	0	0	3	1	0	0	0	27
Galveston	1	0	0	0	0	0	0	1	0	0	16
Houston	2	0	3	11	0	5	0	0	0	0	73
San Antonio	2	0	0	0	0	5	0	0	0	0	69
MOUNTAIN											
Montana:											
Billings	0	1	0	0	0	0	0	0	0	1	4
Great Falls	3	12	0	0	0	1	0	0	0	16	13
Helena	0	0	0	0	0	0	0	0	0	0	2
Missoula	1	0	1	0	0	0	0	0	0	10	7
Idaho:											
Boise	1		0	0	0	1	0	0	0	4	9
Colorado:											
Denver	13		0				0				
Pueblo	1	0	0	0	0	0	0	0	0	2	8

City reports for week ended February 14, 1931—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		
MOUNTAIN—con.											
New Mexico:											
Albuquerque	1	0	0	0	0	2	0	0	0	0	12
Arizona:											
Phoenix	0	1	0	0	0	3	0	0	1	1	21
Utah:											
Salt Lake City	3	6	1	0	0	1	0	0	0	24	28
Nevada:											
Reno	1	0	0	0	0	0	0	0	0	0	6
PACIFIC											
Washington:											
Seattle	11	18	3	2	----	----	0	0	----	33	----
Spokane	7	2	8	4	----	----	0	0	----	0	----
Tacoma	3	1	4	1	0	0	0	0	0	0	27
Oregon:											
Portland	6	2	14	11	0	0	0	0	0	1	69
Salem	0	0	1	0	0	0	0	0	0	0	----
California:											
Los Angeles	46	32	3	7	0	18	2	3	0	15	257
Sacramento	3	4	1	0	0	1	0	0	0	15	36
San Francisco	27	6	1	1	0	10	0	2	0	27	133

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	1	1	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	11	6	1	0	0	0	1	3	0
New Jersey:									
Trenton	1	1	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	9	6	1	2	0	0	0	0	0
Pittsburgh	4	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	0	1	0	0	0	0	0	0	0
Cleveland	1	2	1	0	0	0	0	0	0
Illinois:									
Chicago	9	7	1	0	0	0	0	2	1
Michigan:									
Detroit	3	3	1	0	0	0	0	0	0
Flint	1	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Iowa:									
Davenport	1	0	0	0	0	0	0	0	0
Sioux City [1]	1	0	0	0	0	0	0	0	0
Missouri:									
St. Joseph	1	0	0	0	0	0	0	0	0
St. Louis	3	1	0	0	0	0	0	0	0
Nebraska:									
Omaha	1	0	0	0	0	0	0	0	0

[1] Nonresident.

City reports for week ended February 14, 1931—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	2	0	0	0	0	0	0	0	0
North Carolina:									
Raleigh	0	0	0	0	0	2	0	0	0
Winston-Salem	3	0	0	0	0	0	0	0	0
South Carolina:									
Charleston [1]	0	0	0	0	2	2	0	0	0
Columbia	4	0	0	0	0	2	0	0	0
Georgia:									
Atlanta	0	0	0	0	0	1	0	0	
Brunswick	0	0	0	0	0	1	0	0	0
Savannah	0	0	0	0	1	0	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	6	2	0	0	0	0	0	0	0
Nashville	0	3	0	0	0	0	0	0	0
Alabama:									
Birmingham	5	1	0	0	1	1	0	0	0
Mobile	1	1	0	0	0	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	0	0	0	0	2	2	0	0	0
Shreveport	0	0	0	0	0	1	0	0	0
MOUNTAIN									
Colorado:									
Pueblo	1	0	0	0	0	0	0	0	0
Arizona:									
Phoenix	1	1	0	1	0	0	0	0	0
Utah:									
Salt Lake	1	0	0	0	0	0	0	0	0
Nevada:									
Reno	1	1	0	0	0	0	0	0	0
PACIFIC									
California:									
Los Angeles	3	4	0	0	1	1	1	0	0
Sacramento	0	0	0	0	0	0	0	2	0
San Francisco	0	0	0	0	0	0	0	2	0

[1] Dengue: 10 cases at Charleston, S. C.

The following tables give the rates per 100,000 population for 98 cities for the 5-week period ended February 14, 1931, compared with those for a like period ended February 15, 1930. The population figures used in computing the rates are estimated mid-year populations for 1930 and 1931, respectively, derived from the 1930 census. The 98 cities reporting cases have an estimated aggregate population of more than 33,000,000. The 91 cities reporting deaths have more than 31,500,000 estimated population.

Summary of weekly reports from cities January 11 to February 14, 1931—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Jan. 17, 1931	Jan. 18, 1930	Jan. 24, 1931	Jan. 25, 1930	Jan. 31, 1931	Feb. 1, 1930	Feb. 7, 1931	Feb. 8, 1930	Feb. 14, 1931	Feb. 15, 1930
98 cities	74	108	[2] 79	110	[3] 89	112	[4] 78	92	[5] 66	95
New England	91	133	106	160	106	135	82	119	75	104
Middle Atlantic	56	89	67	91	68	98	53	92	53	78
East North Central	95	126	[6] 94	144	[7] 111	139	96	102	85	114
West North Central	82	110	84	83	111	77	[8] 111	83	55	107
South Atlantic	69	112	[9] 65	116	[9] 73	116	[9] 75	76	59	102
East South Central	70	60	76	66	70	84	52	72	52	66
West South Central	108	192	81	146	183	216	156	157	118	136
Mountain	52	53	35	35	70	35	78	70	[5] 34	62
Pacific	47	81	88	79	45	69	69	36	49	75

MEASLES CASE RATES

98 cities	324	203	[2] 404	220	[3] 420	278	[4] 476	317	[5] 523	411
New England	310	172	522	230	438	341	502	322	534	472
Middle Atlantic	158	117	251	111	306	145	353	176	397	213
East North Central	87	150	[6] 74	135	[7] 144	167	151	171	183	251
West North Central	1,829	372	1,984	467	1,521	424	[8] 1,649	610	1,314	810
South Atlantic	500	182	[9] 804	172	[9] 1,032	314	[9] 1,294	268	1,817	334
East South Central	995	36	698	24	908	54	1,024	72	896	233
West South Central	7	373	10	582	17	593	3	648	17	693
Mountain	374	247	757	220	496	396	1,123	405	[5] 1,136	758
Pacific	55	579	72	626	110	1,028	112	1,028	168	1,243

SCARLET FEVER CASE RATES

98 cities	316	272	[2] 333	288	[3] 337	292	[4] 321	323	[5] 347	302
New England	539	397	575	457	519	346	534	530	683	382
Middle Atlantic	282	212	314	226	328	239	304	260	321	234
East North Central	398	394	[6] 383	375	[7] 380	416	331	427	375	434
West North Central	321	265	353	314	386	283	[8] 519	370	474	331
South Atlantic	304	216	[9] 343	192	[9] 312	224	[9] 304	222	320	252
East South Central	465	90	483	149	512	143	419	191	378	149
West South Central	129	125	142	98	112	73	88	129	105	108
Mountain	331	344	357	379	322	414	261	361	[5] 339	423
Pacific	72	237	119	344	143	306	145	289	123	269

SMALLPOX CASE RATES

98 cities	16	32	[2] 16	26	[3] 17	31	[4] 23	29	[5] 18	26
New England	0	0	0	5	0	0	0	2	0	7
Middle Atlantic	0	0	0	1	0	0	2	0	0	0
East North Central	10	36	[6] 21	19	[7] 25	39	12	34	10	33
West North Central	98	124	77	72	84	48	[8] 168	60	84	48
South Atlantic	0	6	[9] 4	2	[9] 0	6	[9] 0	4	0	6
East South Central	17	0	29	0	17	12	29	0	12	24
West South Central	27	38	34	35	51	73	81	94	132	98
Mountain	78	53	9	26	0	62	44	18	[5] 0	35
Pacific	29	123	20	152	18	152	24	126	29	89

[1] The figures given in this tables are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimates as of July 1, 1931 and 1930, respectively.
[2] Springfield, Ill., and Columbia, S. C., not included.
[3] South Bend, Ind., and Columbia, S. C., not included.
[4] St. Paul, Minn., and Columbia, S. C., not included.
[5] Denver, Colo., not included.
[6] Springfield, Ill., not included.
[7] South Bend, Ind., not included.
[8] St. Paul, Minn., not included.
[9] Columbia, S. C., not included.

Summary of weekly reports from cities January 11 to February 14, 1931—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930—Continued.

TYPHOID FEVER CASE RATES

	Week ended—									
	Jan. 17, 1931	Jan. 18, 1930	Jan. 24, 1931	Jan. 25, 1930	Jan. 31, 1931	Feb. 1, 1930	Feb. 7, 1931	Feb. 8, 1930	Feb. 14, 1931	Feb. 15, 1930
98 cities	5	5	[2] 6	4	[2] 5	5	[4] 4	4	[5] 3	6
New England	0	5	2	0	5	0	2	0	2	2
Middle Atlantic	2	3	3	5	2	5	1	3	2	6
East North Central	2	2	[6] 3	2	[7] 1	3	2	5	1	3
West North Central	4	12	10	2	13	4	[8] 2	2	2	10
South Atlantic	10	6	[9] 14	8	[9] 8	8	[9] 18	12	0	8
East South Central	52	12	12	18	17	6	6	18	29	18
West South Central	14	7	27	3	14	3	24	7	14	7
Mountain	9	62	17	9	0	9	0	0	[5] 0	0
Pacific	2	4	6	2	10	14	0	2	10	4

INFLUENZA DEATH RATES

91 cities	36	19	[2] 52	21	[3] 70	16	[4] 60	14	[5] 59	20
New England	10	10	12	10	34	2	46	5	46	5
Middle Atlantic	59	14	91	14	101	14	68	10	49	14
East North Central	9	17	[6] 18	17	[7] 36	13	52	12	56	17
West North Central	18	17	29	18	29	18	[8] 17	21	56	12
South Atlantic	41	24	[9] 38	34	[9] 127	12	[9] 129	12	118	32
East South Central	63	39	63	52	76	52	63	32	63	58
West South Central	79	60	83	103	100	82	73	50	159	68
Mountain	35	26	44	9	52	9	52	44	[5] 0	35
Pacific	10	12	22	15	14	2	12	7	14	17

PNEUMONIA DEATH RATES

91 cities	219	151	[2] 229	140	[3] 258	164	[4] 233	175	[5] 220	171
New England	159	126	178	138	185	193	286	160	291	193
Middle Atlantic	311	159	332	128	368	158	293	180	254	191
East North Central	124	108	[6] 125	110	[7] 177	128	176	138	182	128
West North Central	212	209	171	150	159	162	[8] 150	159	124	111
South Atlantic	237	186	[9] 280	214	[9] 345	238	[9] 325	216	373	214
East South Central	227	142	296	194	227	239	176	207	164	220
West South Central	228	221	245	288	203	292	214	270	176	256
Mountain	270	256	157	220	200	229	209	379	[5] 187	256
Pacific	118	137	103	77	115	92	72	130	72	107

[2] Springfield, Ill., and Columbia, S. C., not included.
[3] South Bend, Ind., and Columbia, S. C., not included.
[4] St. Paul, Minn., and Columbia, S. C., not included.
[5] Denver, Colo., not included.
[6] Springfield, Ill., not included.
[7] South Bend, Ind., not included.
[8] St. Paul, Minn., not included.
[9] Columbia, S. C., not included.

FOREIGN AND INSULAR

PRECAUTIONARY MEASURES AGAINST INFLUENZA TAKEN IN EGYPT

Information has been received, under date of February 17, 1931, that, in view of the spreading influenza epidemic in Europe, the Public Health Service of Egypt had decided to take severe preventive measures. For a period of approximately two months all those suffering from influenza who may debark from ships will be isolated at the port of arrival in Egypt, either in a government hospital or in a hospital selected by the patient.

CANADA

Provinces—Communicable diseases—Week ended February 14, 1931.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the week ended February 14, 1931, as follows:

Province	Cerebro-spinal fever	Influenza	Lethargic encephalitis	Smallpox	Typhoid fever
Prince Edward Island [1]					
Nova Scotia	1	75			
New Brunswick [1]					
Quebec					23
Ontario		108		10	4
Manitoba			1		3
Saskatchewan	1			17	
Alberta				1	
British Columbia		10		1	1
Total	2	193	1	29	31

[1] No case of any disease included in the table was reported during the week.

Quebec Province—Communicable diseases—Week ended February 14, 1931.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended February 14, 1931, as follows:

Disease	Cases	Disease	Cases
Chicken pox	47	Mumps	21
Diphtheria	31	Scarlet fever	89
Erysipelas	12	Tuberculosis	45
German measles	2	Typhoid fever	23
Measles	49	Whooping cough	33

CZECHOSLOVAKIA

Communicable diseases—December, 1930.—During the month of December, 1930, certain communicable diseases were reported in the Republic of Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	9		Puerperal fever	51	17
Cerebrospinal meningitis	5	4	Scarlet fever	1,673	50
Diphtheria	2,830	165	Trachoma	139	
Dysentery	15	1	Typhoid fever	499	38
Malaria	1		Typhus fever	24	3
Paratyphoid fever	15	2			

JAMAICA

Communicable diseases—Four weeks ended January 31, 1931.—During the four weeks ended January 31, 1931, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		1	Scarlet fever	7	25
Chicken pox	1	1	Tuberculosis	34	62
Dysentery		2	Typhoid fever	11	28
Leprosy	1	2			

PANAMA CANAL ZONE

Communicable diseases—December, 1930.—During the month of December, 1930, certain communicable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chicken pox	5		Mumps	1	
Diphtheria	4		Pneumonia		26
Dysentery (amebic)	14	1	Tuberculosis		37
Dysentery (bacillary)	2	2	Trypanosomiasis	1	
Leprosy	1	1	Typhoid fever	3	1
Malaria	130	5	Whooping cough	5	
Measles	80				

VIRGIN ISLANDS

Communicable diseases—January, 1931.—During the month of January, 1931, cases of certain communicable diseases were reported in the Virgin Islands as follows:

	Cases
St. Thomas and St. John:	
Chancroid	1
Gonorrhea	3
Sprue	1
Syphilis	6
Whooping cough	4
St. Croix:	
Syphilis	5

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

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, 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		Aug. 24–Sept. 20, 1930	Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Week ended— November, 1930		December, 1930				January, 1931					February, 1931		
					22	29	6	13	20	27	3	10	17	24	31	7	14	21
China:																		
Amoy	C	2																
	D	2																
Canton	C		1	1														
Shanghai	C	34	38	2														
	D	3	4															
Shensi Province	C	P																
Swatow	C	2																
Tientsin	C	1																
India	C	51,551	36,529	18,944	3,166	2,689	2,634	2,623	1,745									
	D	23,959	17,635	9,782	1,616	1,404	1,553	1,360	918									
Bassein	C	1																
Bombay	C	1	16	19	2	2	4	5					20	1				
	D	2	11	17	2	1	1	3					6	3				
Calcutta	C	27	24	33	4	6	2	10	9	7	6	6	36	29	24	32		
	D	12	15	16	4	4	1	7	6	4	5	5	25	19	19	23		
Madras	C		2	1					14	44	70	73	47					
	D		2						8	12	19	28	21	11	7	8		
Negapatam	D														1	2		
Rangoon	C	2	1							1			1					
	D	1	1							1			1					
Tuticorin	C		1	1	4		1		1									
	D		1	1														
India (French):																		
Chandernagor	C	1	3	1		1				1	1							
	D		1						1	1	1							
Pondicherry	C		1	1	1	1	1	1	3	9	2	17	9	4	3	3		
	D		1		1	1	1	1	3	3	1	14	3	3	3	2		
India (Portuguese)	C	1		14					1									
	D	1		9														
Indo-China (see also table below):																		
Pnompenh	C		2	1		1	1							1	2	1		
	D					1	1								2			

Saigon and Cholon	C		2	1		1		2	1		4	4	4	1		1		
	D					1					2	2	2	1				
Philippine Islands:[1]																		
Ports—																		
Cebu	C	2																
	D	2																
Iloilo	C	10	1			1					1				2			
	D	14	4			3					1				2			
Manila	C	43	5															
	D	12	1															
Provinces—																		
Antique	C	47	40															
	D	34	18															
Bohol	C	49																
	D	20																
Bulacan	C	4	2															
	D	2	1															
Capiz	C	1													3	56	69	54
	D														2	45	55	39
Cebu	C	25																
	D	11																
Iloilo	C	238	50	30	11	21	13	7	5	13	3	11	41	36	57	27	42	
	D	151	40	23	8	11	8	6	4	10	2	9	27	25	49	21	22	
Negros, Occidental	C	122	28	56	44	38	48	33	28	19	33	40	19	32	33	6	1	1
	D	91	20	41	33	17	45	28	22	16	26	33	15	17	19	5	1	1
Negros, Oriental	C															1		
	D															1		
Pampanga	C	1																
Samar	C	4	7	16	4	4		2		12	2							
	D	2	7	12	4	4		1	1	7	1							
Sorsogon	C			5														
	D			4														
Surigao	C	1	(2)															
	D	2																
Siam	C		4	4	2	1	1	2	2		2	1						
	D		1	4	2	1	1	2	2		2	1						
Bangkok	C		3	3	2	1		1	2	1	1	2	2		1			
	D		2	2	2	1		1	2	1	1	1	1					
On vessel: S. S. Malwa from Shanghai	D	1																

Place		June, 1930	July, 1930	August, 1930	September, 1930			October, 1930			November, 1930			Dec. 1-10, 1930
					1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	
Indo-China (French) (see also table above):														
Annam[3]	C	16	1	3										
Cambodia[3]	C	144	43	59	23	13	2	16		6		1		28
Cochin-China[3]	C	273	46	27	9	6	18	14	6	8		5		8

[1] Figures for cholera in the Philippine Islands are subject to correction.

[2] During the period from Aug. 24 to Sept. 26, 1930, 26 cases of cholera with 17 deaths were reported in Manitum, Surigao Province, P. I.

[3] Reports incomplete.

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

PLAGUE

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

Place		Aug. 24–Sept. 20, 1930	Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Week ended— November, 1930		December, 1930				January, 1931					February, 1931		
					22	29	6	13	20	27	3	10	17	24	31	7	14	21
Algeria:																		
Algiers	C	11	6	11			1	1	1				1		1			
	D			3														
Bone	C														1			
Constantine, vicinity of	C			1						3	1	46			1		1	
	D														1			
Oran	C	10	10	2														
	D	1	3	1														
Plague-infected rats		10	6	1														
Philippeville	C	1	3	2								1						
	D		1									1						
Argentina:																		
Cordoba Province	C							1						1				2
Jujuy Province—Palpala	C														1			1
Santa Fe	C																	2
Belgian Congo	C	5		1				1										
	D	3		1				1										
British East Africa (see also table below):																		
Tanganyika	C						3		2									
	D						3		2									
Uganda	C	202	165	171	37	17	33	24	18	17	14							
	D	191	164	168	37	18	33	24	18	17	14							
Ceylon: Colombo	C	2	3	1	1		4	4	4		4	1	1	1	1	5		
	D	3	3	1	1		3	4	4		4	1		1	1	4		
Plague-infected rats				1	1	1									1	1		
China:																		
Manchuria—Tungliau and Nungan	C	29	1															
Shensi	C	P		1														
Dutch East Indies:																		
Batavia and West Java	C	79	107	143	53	56	41	58	54	56	66							
	D	76	103	146	53	56	39	58	54	57	66							
Plague-infected rats		3																
Java and Madura	D	260	334	501	137	127	132	161	159	143	173	140	142	102				

Egypt:																		
Alexandria	C	10	9	7		1	1	2	1	1		1				1		
	D	8	6	7				1										
Plague-infected rats					1	2			1					1				1
Assiout	C			3		2		7	5	1		1	2	19	2	3	9	
	D			1				1				1	2	2	2		4	
Aswan	C					3												
Beni-Suef	C												1					
Deirout	C													19	2			
	D													2	2			
Gharbieh	C														1			
	D														1			
Girga	C	1							3	1	3					1		
	D									1	1					1		
Manfalut	C											23	5	21	4		11	
	D											5	2	3	1		4	
Minieh	C							1						1	1			
Port Said	C			2														
France: Marseille	C	5	4	4														
Greece (see also table below): Pyrgos	C		2															
India	C	2,497	2,371	2,721	677	746	931	905	987									
	D	1,132	1,068	1,497	443	434	499	480	548									
Bassein	C	2		1								2	1		1	2		
	D	3										1	1			2		
Bombay	C	1	2	1										1				
	D	1	2	1										1				
Plague-infected rats		47	64	30	11	5	12	4	10	9	6	13	10	6	9	9		
Madras Presidency	C	127	196	185	33	62	28	25	30	94	96							
	D	57	110	124	24	26	15	13	14	71	69							
Rangoon	C	10	2	2						1	1			2				
	D	9	2	1						1				2				
Plague-infected rats		8	1	1	1	1		2	1	1			2	1	1			
India (Portuguese)	D			3														
Indo-China (see also table below):																		
Pnompenh	C	3	2		1	3	1	1	1				1	3	2	1		
	D		3	1	1	3	1	1	1				1	3	2	1		
Saigon and Cholon	C	1	1															
Iraq: Baghdad	C		1	P	2	2								2	3			
	D		1		1	1								2	2			
Madagascar (see also table below): Tamatave	C	1	1	5		2	1	1		2								
	D		1	3		2		1										
Morocco	C			5					9		10		13					
	D								4		4		4					
Nigeria: Lagos	C	6	5	38	4	3	2		2	1	1	1						
	D	6	5	5	4	3	2		2	1	1	1						
Plague-infected rats		10	11	13	1	1	1	2	4		1							
Peru: Lima.[1]																		

[1] 8 cases of plague were reported in Lima, Peru, during December, 1930. Plague infection is said to exist in interior towns north of Lima.

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

PLAGUE—Continued

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

Place		Aug. 24–Sept. 20, 1930	Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Week ended— November, 1930		December, 1930				January, 1931					February, 1931		
					22	29	6	13	20	27	3	10	17	24	31	7	14	21
Senegal (see table below).																		
Siam	C	3	1	6												4		
	D	2		5												2		
Bangkok	C			1				1		1	2			4	4			
	D			1				1		1	2			4	3	1		
Nagara Rajsima	C	1	1	1		3		8	4	3	4	6	3	2	1	2		
	D	1	1	1		3		6	3	3	1	3	2	3	1			
Syria: Beirut	C	5		6								1				1		
Tripolitania	C			1	4	6	2	1					2	2	1	3		1
	D				1								2					
Tunisia: Tunis	C			1				P	12			1	1					9
	D																	7
Union of Socialist Soviet Republics: Transcaucasia-Karabakh	C													6				
Union of South Africa:																		
Cape Province	C	1		1		P	P											
	D	1																
Orange Free State	C	2									2							
	D	2									2							
On vessel: S. S. Marionga de Thermiotis at Avonmouth	C									1								

Place		July, 1930	Aug., 1930	Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930
British East Africa (see also table above):							
Kenya	C	97	87	53	58	62	50
Greece (see also table above)	C				2		
Indo-China (see also table above)	C	1	2	5	2	5	1
Madagascar (see also table above):							
Ambositra Province	C				4	16	
	D				4	16	

Place		July, 1930	Aug., 1930	Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930
Senegal:							
Baol [1]	C	62	79	48	53		
	D	48	20	23	35	4	
Dakar [1]	C	140	108	3			
	D	122	90	8			
Louga [1]	C	128	75	61	37	10	
	D	103	33	30	25	3	

Antisirabe Province	C	24	11	21	3	10	-------
	D	24	11	21	3	10	-------
Miarinarivo Province	C	1	2	7	18	8	-------
	D	1	2	7	18	8	-------
Moramanga Province	C	-------	27	18	20	8	-------
	D	-------	27	17	20	8	-------
Tananarive Province	C	28	39	79	125	-------	-------
	D	28	38	79	116	-------	-------
Thies[1]	C	54	34	12	24	27	2
	D	30	20	4	15	23	1
Tivaouane[1]	C	119	110	20	53	31	2
	D	70	54	14	31	25	1

SMALLPOX

Place		Aug. 24–Sept. 20, 1930	Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Week ended— November, 1930		December, 1930				January, 1931					February, 1931		
					22	29	6	13	20	27	3	10	17	24	31	7	14	21
Algeria:																		
Algiers	C	-------	-------	-------	-------	-------	-------	-------	1	-------	-------	-------	-------	-------	-------	1	-------	-------
Bone	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	1	-------	-------	-------
Constantine	C	-------	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Oran	C	-------	-------	-------	-------	-------	-------	3	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Brazil:																		
Porto Alegre (alastrim)	C	1	26	36	20	8	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Rio de Janeiro	C	-------	-------	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
British East Africa (see also table below): Tanganyika	C	522	95	17	7	26	18	334	23	1	57	3	-------	-------	-------	-------	-------	-------
	D	60	6	1	-------	1	-------	35	1	-------	3	-------	-------	-------	-------	-------	-------	-------
British South Africa: Southern Rhodesia	C	1	153	95	12	-------	4	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
	D	-------	-------	-------	2	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Canada:																		
Alberta	C	1	22	-------	1	-------	-------	-------	-------	-------	19	-------	-------	7	-------	-------	1	-------
British Columbia—Vancouver	C	2	2	3	-------	-------	1	-------	-------	-------	1	2	-------	-------	-------	2	1	-------
Manitoba	C	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	1	-------	-------	-------
Winnipeg	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	1	-------	-------	-------	-------	-------	-------
Nova Scotia	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	1	-------	-------	-------
Ontario	C	10	19	59	7	12	3	1	1	-------	8	8	10	3	32	4	10	-------
Kingston	C	-------	-------	-------	-------	-------	-------	-------	-------	2	4	-------	1	-------	-------	-------	-------	-------
North Bay	C	-------	-------	-------	-------	-------	-------	-------	-------	1	-------	1	-------	-------	-------	-------	1	-------
Ottawa	C	5	-------	37	-------	8	1	1	-------	-------	2	-------	1	1	1	-------	-------	1
Sault Ste. Marie	C	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	1	11	8	5	6	-------	-------
Toronto	C	1	-------	-------	-------	2	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Quebec	C	-------	-------	-------	1	-------	-------	1	-------	-------	-------	-------	-------	2	-------	-------	-------	-------
Saskatchewan	C	1	3	2	2	-------	16	-------	-------	-------	-------	-------	7	6	5	20	17	-------

[1] Reports incomplete.

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

SMALLPOX—Continued

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

Place		Aug. 24–Sept. 20, 1930	Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Week ended— November, 1930		December, 1930				January, 1931					February, 1931		
					22	29	6	13	20	27	3	10	17	24	31	7	14	21
China:																		
Changking	C	P	P	P	P		P	P	2									
Foochow	C	P	P	P		P		P				P		P				
Hong Kong	C									1				1				
Manchuria—																		
Harbin	C			1														
Kwantung—Dairen	C				2		1	1	1									
	D							1										
Nanking	C	P	P	P			P	P	P	P	P	P	P		P			
Shanghai—																		
Foreigners only	C	18	1	2			3	5	4	2	6	2	1	1	6	4		
Including natives	D	2		1				4	5	1	1	4	2	4	4	3	5	
Swatow	D	2	4	3	1			2		2	1	2	1	1	3			
Tientsin	C		1	1	1	1							1					
Chosen (see table below).																		
Colombia: Cali	D		2				1											
Dutch East Indies:																		
Java—Batavia and West Java	C	11	14	26	2		2	2	2		2					1		
	D	4	4	4	1			1		1	1					1		
Sanggi Islands	C	14		29														
	D	3		3														
France (see table below).																		
Greece (see table below).																		
Great Britain:																		
England and Wales	C	341	325	372	116	160	95	137	138	135	164	228	187	272	286	213		
Bradford	C	3	1	1			1				1			1		3		
Cardiff	C		1															
Leeds	C		1	2							2							
London	C	120	29	172	67	27	48	42	27	38	48	48	45	47	33	24		
London and Great Towns	C	223	52	296	136	74	112	111	105	131	162	162	154	198	194	147		
	D	1		1		1												
Sheffield	C													1	1			
Stoke-on-Trent	C	1		1										1				

Honduras:																	
Naco	C	5															
Puerto Castilla	C																
Tela	C											4	7	1		3	3
India	C	3,131	2,322	2,412	787	865	1,037	938	942								1
	D	680	572	606	221	174	274	205	262								
Bombay	C	6	1				1										
	D	5					1			1	1	2	2	2	1		
Calcutta	C	14	12	9	3	5	6	4	10	19	15	15	28	28	40	47	
	D	9	11	7	3	2	4	2	7	13	10	10	16	22	29	33	
Cochin	C	3	12	25	4	5	6	7	6	7		2	5	6	8	10	
	D	1	1	3	2		2					1					
Karachi	C	4			2	1								2		1	
	D	2				1								1		1	
Madras	C	34	19	9	3	5	6	6		1	3	4	7	3	2		
	D	6	8	2			2	1			1		2				
Moulmein	C	1												2			
	D	1															
Negapatam	C	9	14	9	3		1	2									
Rangoon	C		2	1		1											
	D			1													
Tuticorin	C		1														
Vizagapatam	C		1													1	
India (French):																	
Chandernagor	C	3	3	3						5			3	2		3	
	D	2	1	1						2	1		1				
Karikal	C	5	1								1	2	1	2			
	D	2	1									2		2			
Pondicherry Province	C	35	38	11	7	7		5	8	8	7	11	16	8			
	D	33	36	11	7	5		5	7	8	7	10	16	8			
India (Portuguese)	C	4							3			1	1				
Indo-China (see also table below):																	
Pnompenh	C		2			1				2						1	
	D					1										1	
Saigon and Cholon	C	1		2	2	1		1					3	1		2	
	D	1		2	1			1					2			2	
Iraq:																	
Baghdad	C	1	2														
Mosul Liwa	C		69	6	7	9						1		2		1	
	D		27		1	1											5
Ivory Coast (see table below).																	1
Mexico (see also table below):																	
Jalisco (State) Guadalajara	D		3	3	1		2							1			
Juarez	D		1	1													
Mexico City and surrounding territory	C	12	13	9	1	2		3	1	5							
	D	5	3	2				6	2	1							
Vera Cruz	C			1													
Morocco (see table below).																1	
Nicaragua: Porto Cabezas	C								2								
Poland	C			8	1	2					23	2					
Portugal: Lisbon	C	27	16	20	11		15	11	21	17		34	27	31	15	30	

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

SMALLPOX—Continued

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

Place		Aug. 24–Sept. 20, 1930	Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Week ended— November, 1930		December, 1930				January, 1931					February, 1931		
					22	29	6	13	20	27	3	10	17	24	31	7	14	21
Siam	C		1															X
Somaliland, British: Boales	C		1	1			1											
	D		1									1						
Spain	C	5		51	23	21	23		19	31	18				10			
Straits Settlements	C	6	5	10	3	9	2	3	3		2	1	3	1	2	1		
	D	1	1	2	1	2	2	2	2		1				1			
Sudan (Anglo-Egyptian)	C	128	82	5		3		47		47		17	1	7		3	1	1
	D	52	7	1				5		5		1		7				
Sudan (French) (see table below).																		
Switzerland: Berne Canton	C		1															
Syria (see table below).																		
Tunisia: Tunis	C		2								13	4	6	1	1			
Turkey (see table below).																		
Union of South Africa:																		
Cape Province	C	P	P	P	P		P	P	P	P	P	P						
Orange Free State	C			2	P	P	P											
Transvaal	C	P	P	P	P	P	P	P	P	P	P							
Upper Volta	C					6						4						
	D											2						
On vessel:																		
S. S. Clan Mactoggart at Suez	C																2	
S. S. Muncaster Castle at Manila from Hong Kong	C									1								X
S. S. Matheran at Suez from Calcutta	C													1				

Place		July, 1930	August, 1930	September, 1930	October, 1930			November, 1930			December, 1930			January, 1931		
					1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31
Indo-China (see also table above)	C	238	93	192	32	62	164		86		88	9	14			46
Ivory Coast	C						4		2		9					
Sudan (French)	C	34	39	P		17					43		96			
	D		3			2					16		4			
Syria: Beirut	C	2	1												1	

Place		July, 1930	Aug., 1930	Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930
British East Africa (see also table above):							
Kenya	C	186		424		653	
Chosen	C	3	2				
Seishin	C	2					
France	C	1					

Place		July, 1930	Aug., 1930	Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930
Greece	C	1	6				4
Mexico: Durango (see also table above)	D	3	3	2			1
Morocco	C	3	8	4	4	20	
Turkey	C	51	21	19	74		
	D	13	4	2	1		

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

TYPHUS FEVER

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

Place		July 27–Aug. 23, 1930	Aug. 24–Sept. 20, 1930	Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Week ended— November, 1930		December, 1930				January, 1931					February, 1931	
						22	29	6	13	20	27	3	10	17	24	31	7	14
Algeria:																		
Algiers	C	2	3		1		2											
Constantine Department	C	3		2	1		1		1			3	3		6	6	19	
Oran	C	1	1	3			3		2						1	2		
Bulgaria	C	1	4	6	3	1	1	3	6	3				9	2	1		
	D									1								
China:																		
Manchuria—Harbin (see also table below)	C	2	2	1				1										
Shanghai	C	1																
Chosen (see table below).																		
Czechoslovakia (see table below).																		
Egypt:																		
Alexandria	C	1	3	1	2	1	1											
	D		1		2													
Beheira Province	C		1							1								
	D									1								
Cairo	C	7	2							1	1						1	
Port Said	C	4	1	1	2										1			
Great Britain: Scotland	C																1	
Glasgow	C															2		
	D															1		
Ireland:																		
Irish Free State—																		
Mayo County—																		
Castlebar	C	1																
Westport	C	1																
Latvia (see table below).																		
Lithuania (see table below).																		
Mexico:																		
Durango	D		1	2												1		
Mexico City, including municipalities in Federal District	C	9	7	8	11	1	1		12	5	2							
	D	2	2	2	4	2	3		2	4	1							
San Luis Potosi	D							1	1									2

Morocco	C	8	2		3	1				8					1	2		
	D			1														
Palestine	C	3	3	3	3	1	6			1	1		2	1	1			3
Poland	C	34	23	22	37	12		21	9	18	5	28	11		21	16	50	
	D	3	1	2		1		3	3	3					1	4	1	
Portugal: Oporto	C	1		2	4	2	2	2							1			
Rumania	C	9	4	14	41	19		15		20	34		59	54				
	D	2			2	1		2		1	2		2	1				
Spain	C		1	2	4			1										
	D		1	2				1										
Tunisia	C	10	6	12		5		23							7	4	5	
Turkey (see table below).																		
Union of South Africa:																		
Cape Province	C	P	P	P	P	P	P	P	P	P	P	P	P					
Municipality of East London	C		2	1	1	1				P		2	1					
Natal	C	P	P	2	P								P					
Orange Free State	C	P	P		P					P	P		P					
Transvaal	C	P	P	P	P	P	P			P	P	P	P					
Yugoslavia (see table below).																		

Place		July, 1930	Aug., 1930	Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930
China: Harbin (see also table above)	C	14	5		3		
Chosen: Seoul	C	3	2	1	7	1	1
Czechoslovakia	C		1			16	16
Greece: Athens	C	6	6	4	4	4	10
Latvia	C	3	1	2			

Place		July, 1930	Aug., 1930	Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930
Lithuania	C	18	7	24	1	5	1
	D		1	2		1	
Turkey	C	7	11		28	3	2
Yugoslavia	C		2		2	2	
	D		1		1		

YELLOW FEVER

	Cases	Deaths
Brazil:		
Rio de Janeiro State—		
Cambucy, Jan. 1–25, 1931	3	3
Friburgo (imported), Jan. 25–30, 1931	1	
Padua, Jan. 18–24, 1931	1	1
Para, July 29, 1930		1

	Cases	Deaths
Gold Coast:		
July 10, 1930	1	
Albosso, Aug. 4, 1930		1
Nigeria: Lagos, July 12, 1930 (probably laboratory infection)	1	