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Penetration of Arsenic into the Cerebrospinal Fluid, With Particular Reference to the Treatment of Protozoal Infections of the Central Nervous System.

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A large amount of clinical evidence which has accumulated during the last decade, on the treatment of protozoal infections of the central nervous system by means of intravenous injections of various organic arsenicals, has clearly demonstrated that this method of treatment fails to yield the brilliant results which can be obtained in cases in which the infecting organism has not yet invaded the central nervous system.

For instance, cases of human trypanosomiasis in the early stages, before the trypanosomes are to be found in the cerebrospinal fluid, can be cured by atoxyl and tartar emetic; whereas, in a more advanced stage of the disease, associated with an invasion of the cerebrospinal fluid, it is impossible to influence either the parasite count of that fluid or the nervous manifestations. The same difficulties are met with in the treatment of the parenchymatous forms of neurosyphilis. In this condition the parasites have invaded the nerve tissue presumably by way of the lymphatics, causing inflammation, which is followed sooner or later by connective tissue cell proliferation and atrophy of the nerve tissue. It would of course be absurd to expect a complete cure in far advanced cases of general paresis or tabes by any drug or any method of treatment, as it is obviously impossible to cause a regeneration of the large mass of pathological and partly destroyed nerve tissue. But, unfortunately, it seems almost equally difficult to benefit even the relatively early stages of these diseases by means of the customary treatment with the arsphenamines. In view of the fact that far advanced syphilitic lesions in parts of the body outside of the central nervous system respond so readily to relatively few injections of arsphenamine, the question has often been raised as to the reason for the difference in the behavior to arsenic of syphilitic lesions within and without nerve tissues.

Swift and Ellis, Wechselmann, Marinesco, and others believe that the failure of arsenic given intravenously to reach the cerebrospinal fluid, and subsequently the nerve parenchyma, is due to failure of the drug to pass the choroid plexus. The principal proof for this assumption, according to these investigators, is to be found in the relatively small amounts of arsenic which can be demonstrated by chemical analysis in the cerebrospinal fluid after intravenous injections of therapeutic doses of arsphenamine and its substitutes. Hence, attempts were made to avoid the difficultly permeable choroid plexus by introducing the drug, in one form or another, directly into the lumbar subarachnoid space. This, then, represents the essential theoretical foundation of the Swift-Ellis treatment.

It should be stated at once that another group of investigators does not admit the rationale of this treatment, and we agree with them on many points. First of all, it should not be forgotten that our knowledge of the formation and absorption of the cerebrospinal fluid is far from complete; and even less do we know as to the path that drugs and other substances foreign to that fluid take. It is, however, pretty well established that under physiological conditions the major part of the fluid is formed by the choroid plexus. Whether or not drugs which can gain access to the cerebrospinal fluid must of necessity pass from the general circulation through the choroid plexus is not a settled question, though it is possible that this may be the case.

The second objection is to be found in the fact that the arsenic content of the cerebrospinal fluid, after intravenous injection of an arsenical, is no true index of the parasiticidal efficiency of the substance for parasites which are located in the cerebrospinal fluid, and even less so for those hidden away in the nerve tissue, since it was shown by Voegtlin and Smith (Homer W.) that only one form of arsenic is directly toxic for the parasites, namely, that of the trivalent arsenious oxides (R·As: O). If, therefore, arsenic in excess of the normal amount is found in the cerebrospinal fluid by chemical analysis it does not necessarily follow that this arsenic is in the active form. Moreover, even taken for granted that all of the arsenic is actually present in an active condition, this arsenic would exert a toxic effect upon the parasites in the cerebrospinal fluid only if the minimal lethal concentration had been reached. Finally, in order that this arsenic could act upon the parasites located in the nerve parenchyma, it would have to be assumed that it had the power to penetrate into that tissue from the cerebrospinal fluid, an assumption which is not subject to any direct proof.

These brief statements will have convinced the reader that the experimental attack on these problems is not a simple matter. However, in view of the great importance of the discovery of useful and safe remedies for the treatment, and especially the prevention,

of parasyphilis and the treatment of human trypanosomiasis, which is such a serious problem of tropical countries, it seemed advisable to re-investigate the question of the penetration of various forms of arsenic into the cerebrospinal fluid and the central nerve tissue.

The problem was divided into two parts, the chemical and the biological. The chemical problem dealt with the study of (1) the rate of disappearance of arsenic from the blood; (2) the arsenic content of the cerebrospinal fluid; and (3) the arsenic content of the brain tissue. The biological part concerned itself with the parasiticidal effect obtainable from intravenous injections of various arsenicals on parasites which had been previously placed in the cerebral subarachnoid space.

METHODS AND RESULTS.

The work was carried out on adult rabbits weighing about 2 kilograms. For the *chemical investigation*, the animals were injected early in the morning with the arsenical under consideration, using the marginal ear vein. Under light ether anesthesia, the rabbits were then rapidly exsanguinated from the heart at different times after the intravenous injection, the blood being collected in suitable receptacles. Care was always exercised to bleed the animals very thoroughly, in order to remove as much blood from the organs as possible. Immediately after death, the temporal bones were removed, avoiding injury to the dura. The cerebrospinal fluid was then collected by inserting a blunt capillary glass pipette into the subdural space and aspirating the clear and colorless spinal fluid, which was then placed in a clean, weighed porcelain dish. In order to collect as much fluid as possible, the posterior part of the body was finally raised, which action usually caused a considerable extra yield of fluid from the spinal subarachnoid space. The total brain was then removed, washed free from adhering cerebrospinal fluid with arsenic-free distilled water, drained of the excess water, and placed in clean porcelain dishes. The weight of the various fresh samples was determined and the dishes were then placed in an oven and the material was charred. To complete the incineration and to determine the arsenic content of the remaining ash, the method previously described by Voegtlin and Thompson (1921) was used. In order to eliminate the possibility of contamination of the specimen with extraneous arsenic, the analytical work was carried out in a separate room.

The *biological method* was elaborated two years ago by M. I. Smith and Voegtlin (1921). After considerable preliminary experimentation it was found that if a heavy suspension of *Trypanosoma equiperdum* is injected into the cranial subarachnoid space of the rabbit, the parasites will survive and be demonstrable in considerable num-

bers in the cerebrospinal fluid for at least 48 to 72 hours. Thereafter, the trypanosomes gradually invade other tissues, resulting in a systemic infection. The period of sojourn of the majority of trypanosomes in the cerebrospinal fluid was deemed sufficiently long to permit a study of the comparative permeability of the meninges for the various arsenicals, as determined by their relative trypanocidal action in the subarachnoid space.

The *Trypanosoma equiperdum* of our standard strain used in these experiments was grown in the white rat. When the rats had developed a moderate infection (100,000 to 250,000 parasites per cu. mm.), they were bled by quick decapitation, the blood was defibrinated by means of a few glass beads and centrifugalized at low speed for about 10 minutes, at the end of which time the blood elements separated into three distinct layers, the lower consisting of red blood cells, the upper being clear serum, and the middle layer consisting of a heavy suspension of trypanosomes and a comparatively few leucocytes in a minimal amount of serum. About 0.3 c. c. of such a suspension can usually be obtained from the blood of a rat weighing about 150 grams, and about 0.5 c. c. of the suspension was used for injection[1] into the subarachnoid space of the rabbit. A larger volume of the suspension may be obtained if the rats are allowed to develop a higher grade of infection, but experience has shown that with much higher infections the resistance of the trypanosomes appears to be weakened, and the results obtained from the use of suspensions of highly infected rats are frequently uncertain. The suspension must be injected immediately following the centrifugalization of the blood. In these experiments the suspensions employed were obtained from the blood of moderately infected rats only, and presented, on microscopical examination, very actively motile trypanosomes at the time of the injection.

The rabbits were lightly etherized and the skull was trephined in the parietal region by removing a button 6 mm. in diameter, approximately 7 mm. to the left of the midline, care being taken not to injure the dura. The measured volume of the trypanosome suspension was then injected with a fine hypodermic needle directed into the subarachnoid space bounded by the cerebral hemispheres, cerebellum, and pons. After recovery from the anesthetic, which takes place very rapidly, the animal appears normal in every respect. The arsenical under investigation was then injected into one of the marginal ear veins. At the end of twenty-four hours the animals were chloroformed, thoroughly exsanguinated from the heart, the trephine opening was enlarged, and specimens of cerebrospinal fluid were

[1] The injection was made by means of a syringe and a very fine hypodermic needle. The bore of the needle must be small in order to prevent leakage of cerebrospinal fluid, which might otherwise occur after withdrawal of the needle.

taken from the several subarachnoid spaces for microscopical examination for trypanosomes. A most careful search was made in each of at least six different specimens of cerebrospinal fluid taken from the different subarachnoid spaces of the brain and medulla. Absence of trypanosomes from the cerebrospinal fluid was taken as evidence of the permeability of the meninges for the arsenical under consideration or some trypanocidal derivative thereof.

More than thirty control experiments were made to determine the viability of the trypanosomes in the cerebrospinal fluid. These include two experiments in which the animals were treated with maximal tolerated doses of the inorganic trivalent and pentavelent arsenicals, e. g., 7 c. c. sodium arsenite and 10 c. c. sodium arsenate of a 1/100 arsenic equivalent solution per kilo, respectively. Neither of these drugs had any therapeutic effect whatever. Actively motile trypanosomes were found in great abundance in the cerebrospinal fluid of all the controls up to 72 hours following their injection into the subarachnoid space. In several instances the cerebrospinal fluid of the controls was injected intraperitoneally into white rats to determine whether the trypanosomes retained their pathogenicity after a sojourn in the subarachnoid space of the rabbit. From such tests it appeared that their virulence had not altered to any perceptible degree.

The toxicity of the drugs included in this investigation was established also in rabbits, the drugs being injected into the marginal ear vein.

The drugs first investigated were arsphenamine (alkaline solution) and neoarsphenamine. As was briefly stated in a preliminary abstract of this work (M. I. Smith and Voegtlin, 1921), these two drugs appear to penetrate into the cerebrospinal fluid with considerable difficulty. Doses corresponding to those used in the treatment of syphilis in man exert only a slight effect upon the trypanosomes in the subarachnoid space. This fact is well shown by the results summarized in Table I, in which the drugs are arranged in the order of decreasing effectiveness, taking as a criterion of the latter the percentage of the animals whose cerebrospinal fluid was cleared of parasites following treatment with a given dose of the arsenical. For instance, a dose of 10 mg. of arsphenamine per kilo (corresponding to 0.6 gm. for a human being weighing 60 kilo) cleared the cerebrospinal fluid only in one out of nine rabbits subjected to this treatment, or a percentage efficiency of 11. A dose four times as large gave a percentage efficiency of only 75, surely a surprisingly low figure, when due consideration is given to the fact that this dose represents about one-third of the fatal dose. Still higher doses do not seem to improve the effectiveness; on the contrary, two-thirds of the minimum lethal dose give only 57 per cent efficiency.

TABLE I.—*Trypanocidal effect of intravenous medication on parasites in cerebrospinal fluid in rabbits.*

Preparation.	Dose.			Number of rabbits.	Efficiency (per cent).
	C. c. 1/100 arsenic equivalent solution per kilo.	Mgs. per kilo.	Per cent of M. L. D.		
(1) Tryparsamid	4	10	1	5	0
	8	20	2	8	62
	16	40	4	8	87
(2) Sulpharsphenamine	2	7	2	6	33
	4	14	4	9	66
	8	28	8	6	66
	16	56	16	11	82
(3) 3-amino-4 oxyphenyl arsonic acid	8	18	6	8	0
	16	36	13	8	75
	24	54	19	4	75
	32	72	26	8	62
	50	115	41	8	87
(4) Arsacetin	4	14	4	6	0
	8	28	8	7	28
	16	57	16	8	88
	25	90	25	8	75
	50	180	50	8	100
(5) Atoxyl	4	12	16	8	62
	8	24	32	8	62
	16	48	64	3	100
	25	75	100	3	100
(6) Neoarsphenamine	4	16	10	10	30
	8	32	20	8	62
	16	64	40	8	75
	25	102	62	8	75
	33	135	82	8	75
(7) Arsphenamine	4	10	8	9	11
	8	20	16	7	42
	16	40	32	4	75
	25	62	50	4	75
	33	82	66	7	57
(8) Silver arsphenamine	8	31	22	7	28
	16	62	44	8	37
	24	93	66	3	33
(9) "Arsenoxide"	2	6	25	2	0
	4	12	50	3	33
	7.5	22	93	5	60
(10) $CH_2AsO(ONa)_2$	16	48	16	6	0
	25	75	25	2	0
	50	150	50	4	25
	100	300	100	2	0

A similar situation is met with in the case of neoarsphenamine, though this drug appears to be slightly superior in its penetrative power. Sixteen milligrams per kilo (or 0.96 gm. for a human being weighing 60 kilos) cleared the cerebrospinal fluid only in three out of ten animals so treated; and four times this dose, or 40 per cent of the minimum lethal dose of this particular lot of neoarsphenamine, was necessary to produce a percentage efficiency of 75. Larger doses did not improve the result. These results obtained with arsphenamine and neoarsphenamine are illustrated graphically in Chart 1. The ordinates represent the percentage efficiency, and the

abscissæ the dose of the drug in per cent of its minimum lethal dose. The points indicating the actual findings were connected in the case of each drug (except atoxyl*), so as to give at a glance the general relation between the efficiency of the lowest dose experimented with and that obtained with gradually increasing doses. It is obvious that those drugs that show a very steep curve, and whose abscissæ points are very near the zero point, are the most efficient drugs, when due consideration is given to the safety factor (the fraction of the M. L. D.).

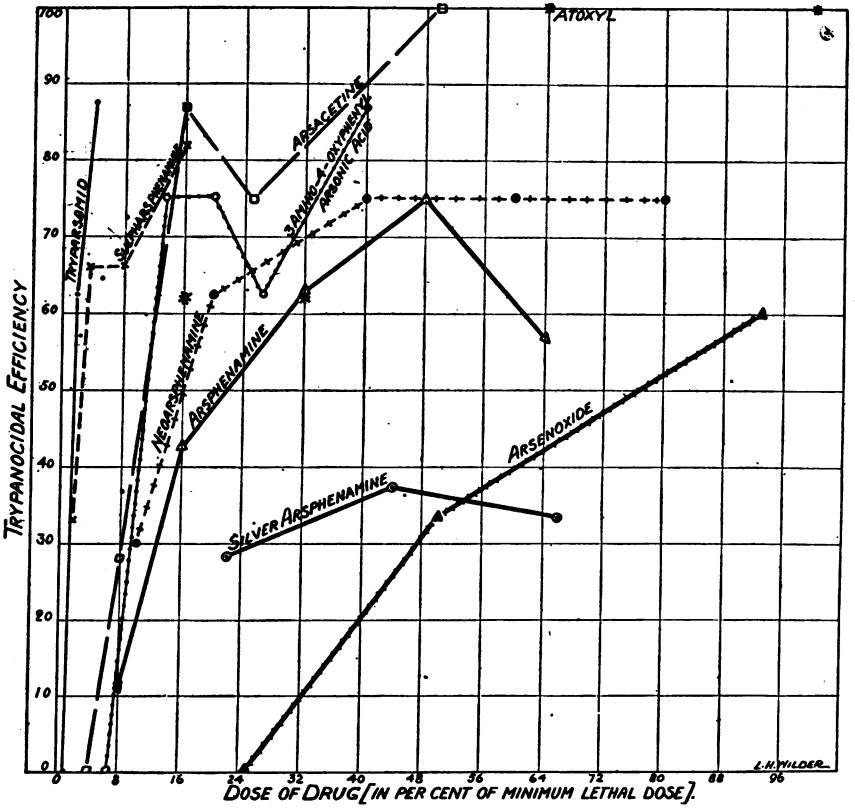

CHART 1.

Considered from this aspect, neoarsphenamine (at least the particular lot used in these experiments) is slightly more effective than arsphenamine. It may here be pointed out that these two drugs are markedly inferior to some other arsenicals studied, a fact which will be referred to again.

As to the results obtained in the chemical analysis of the cerebrospinal fluid and brain, for the presence of arsenic after intravenous treatment of normal rabbits, it should be emphasized that the data include only findings up to six hours after the time of injection. It was not feasible to follow the arsenic content over a period of a day.

However, the six-hour period was deemed sufficiently long, in view of the fact that these animals were injected with about five times the ordinary therapeutic dose, and therefore it could reasonably be expected that sufficient arsenic would penetrate into the central nervous system for purposes of establishing the order of magnitude of this

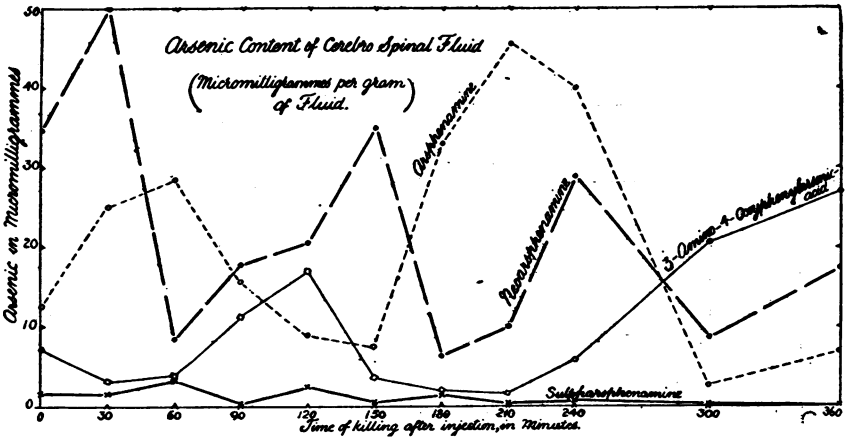

CHART 2.

penetration. The average arsenic content of the cerebrospinal fluid of eight normal rabbits, which were fed for several weeks on oats and kale in a special room, was found to be 0.69 micromilligram per gram of fluid, with a maximum of 1.55 and a minimum of 0.5 micromilligram. These traces of arsenic represent the so-called physi-

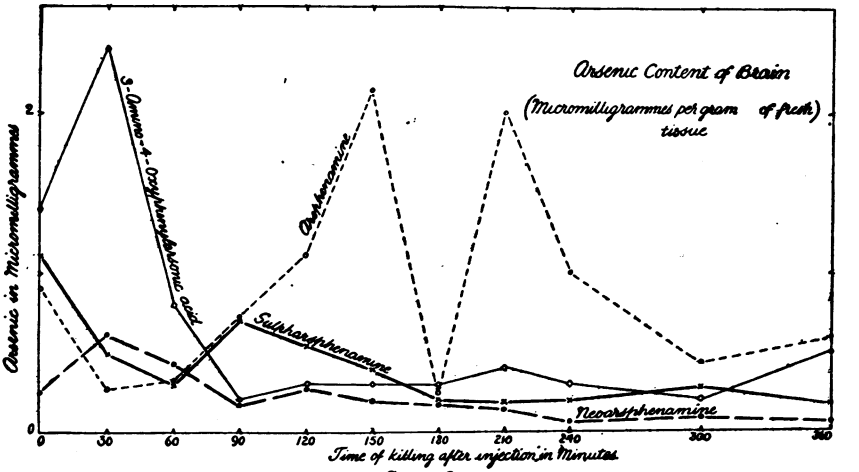

CHART 3.

ological arsenic which is derived from the traces of arsenic consumed with the food and drinking water. In Chart 2 there is given the arsenic content of the cerebrospinal fluid at various intervals following the intravenous injection of 16 c.c. of a 1/100 arsenic equivalent

solution of arsphenamine or neoarsphenamine per kilo body weight. The specimen of cerebrospinal fluid obtained from the rabbit which was exsanguinated within a few minutes after the injection of ars-

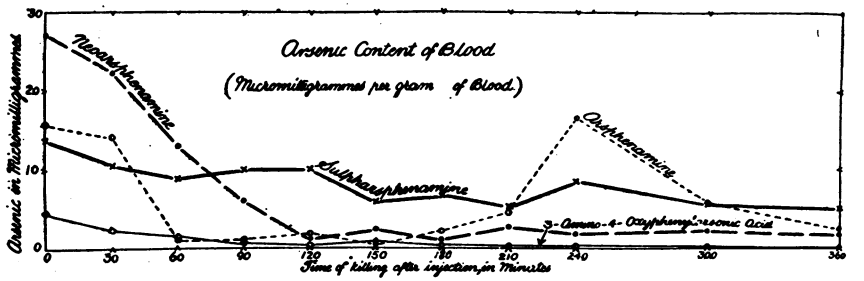

CHART 4.

phenamine contained considerably more arsenic (12.5 micromilligrams per gram) than the normal control. The later intervals gave figures which, when connected, yielded a curve which showed a peri-

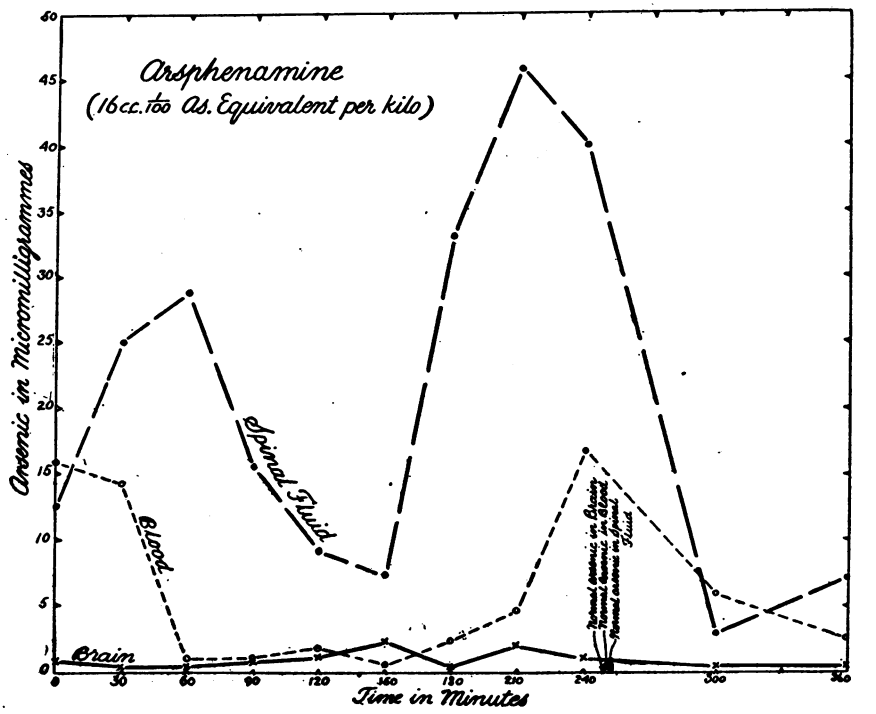

CHART 5.

odic increase and decrease of the arsenic, the maximum being reached at 210 minutes. Similar findings were obtained with neoarsphenamine, with this difference however: The maximum was reached in 30 minutes.

The principal conclusion to be drawn from these data is that after large doses of arsphenamine (40 mg. per kilo) or of neoarsphenamine (64 mg. per kilo) the cerebrospinal fluid contains arsenic up to 46 and 50 micromilligrams, respectively, per gram of fluid. Experiments, which will be described in another paper, indicate that our normal strain of *Trypanosoma equiperdum* is killed off in a blood suspension *in vitro* in 6 minutes by the addition of "arsenoxide" in such amounts as to yield a final concentration of 7.5 micromilligrams of arsenic per cubic centimeter. If, therefore, all of the arsenic found by chemical analysis of the cerebrospinal fluid in our experiments were present in the most toxic modification, namely,

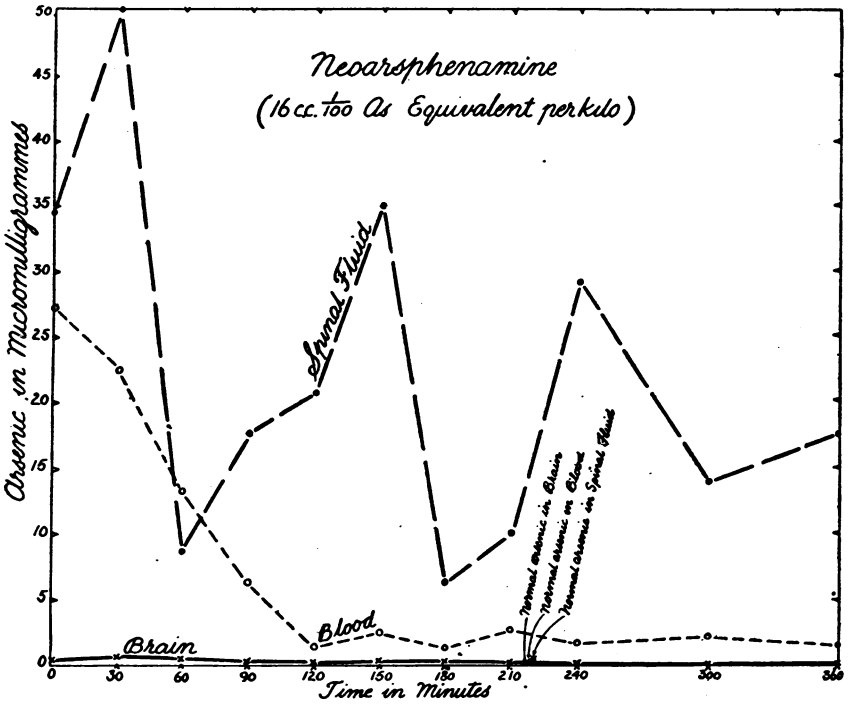

CHART 6.

that of "arsenoxide," the 7.5 micromilligrams of arsenic per c.c. would be quite sufficient to clear the fluid of the parasites. The fact that in only 75 per cent of the animals the fluid was actually cleared would indicate that not all of the arsenic found by chemical analysis was actually in the "arsenoxide" form.

Passing now to the effect of the same intravenous treatment with arsphenamine and neoarsphenamine on the arsenic content of the brain, Chart 3 shows that there is found a higher percentage of arsenic as compared with that of normal controls. The latter figure was established on a series of 4 normal rabbits, exsanguinated from

the heart. The brain tissue of these animals contained per gram of fresh tissue, 0.04, 0.02, 0.01 micromilligram, and a trace, respectively, an average value of 0.02 micromilligram. When this figure is compared with the figures obtained after treatment with arsphenamine and neoarsphenamine (Chart 3), it will be noticed that the animals treated with arsphenamine show a higher arsenic content, with a maximum of over 2 micromilligrams 150 minutes after the injections, i. e., 100 times the normal amount of arsenic. In the neoarsphenamine series the increase is of a lower order, never exceeding 25 times the normal figure. A correct interpretation of these results is not a very easy matter, for the reason that due allowance must be made for the arsenic of the residual blood of the brain tissue. It will all depend on just how much of the arsenic found in the brain can be attributed to this source.[1] An approximate estimate of the influence of residual blood can be had from an examination of Charts 5 and 6.

It is seen that after an injection of arsphenamine the brain arsenic during the first hour never exceeds more than one-sixteenth of the corresponding blood arsenic; during the next 100 minutes the brain arsenic is practically the same as the blood arsenic, and this period is followed by a marked increase in blood arsenic without a corresponding rise in brain arsenic. If, therefore, the arsenic of the residual blood has any influence on the total brain arsenic, this factor can not be a very significant one, as otherwise there would be a better parallelism between blood and brain arsenic. The same argument applies also to the neoarsphenamine series; and as the absolute brain arsenic considerably exceeds the physiological value, it is safe to conclude that arsenic has actually penetrated the brain tissue. Whether or not this arsenic could function therapeutically can not, of course, be decided; but, at all events, these observations seem to indicate that fairly large doses of arsphenamine and neoarsphenamine may lead to an increased arsenic content of the brain. That this increase of brain arsenic is of an order of magnitude similar to that found in other tissues can be deduced from the data in Table II.

[1] Attempts to eliminate the complicating factor of residual blood, by means of perfusion with Ringer's solution of the brain through both carotids, yielded inconsistent results.

TABLE II.—*Arsenic content of tissues and body fluids of rabbits (micromilligrams per gram fresh material).*

Tissue analyzed.	Normal As.	Sodium salt of—						
		16 c. c. per kilo 1/100 arsenic equivalent solution.					4 c. c. per kilo 1/100 arsenic equivalent solution.	
		Arsphenamine.	Neoarsphenamine.	Sulpharsphenamine.		3-amino-4-oxyphenylarsonic acid.	p-oxy-m-aminophenylarsenoxide (arsenoxide).	
		100 min.	100 min.	100 min.	200 min.	100 min.	15 min.	100 min.
Heart	0.50	2.85	.....	.....	.....	1.07	1.77	.....
Spinal fluid	0.69	7.21	13.09	0.71	0.69	28.00	11.00	0.42
Brain	0.02	1.16	0.21	0.25	0.02	2.90	0.57	0.17
Skeletal muscle	0.05	0.33	.....	.....	.....	1.08	2.05	.....
Lungs	1.91	3.95	.....	.....	.....	5.47	2.83	.....
Blood	0.29	5.25	7.10	7.23	8.11	3.65	2.40	0.71
Spleen	5.33	16.83	.....	.....	.....	35.27	6.83	.....
Kidney	0.42	2.52	.....	.....	.....	4.31	3.27	.....
Bile	1.12	196.54	.....	.....	.....	64.05	40.25	.....
Intestinal tract and content	0.07	6.98	.....	.....	.....	0.95	3.70	.....
Urine	2.68	19.62	.....	.....	.....	939.83	16.18	.....
Liver	0.55	16.17	.....	.....	.....	1.34	9.38	.....
Stomach content	0.11	12.36	.....	.....	.....	1.73	2.79	.....
Stomach wall	0.56	1.03	.....	.....	.....	0.69	0.79	.....
Skin	0.20	1.80	.....	.....	.....	1.95	0.16	.....
Residue tissue	0.15	0.64	.....	.....	.....	2.80	0.92	.....
Embryo	.....	0.22	.....	.....	.....	.....	0.21	.....

In view of the fact that such large doses of arsphenamine and neoarsphenamine were required to produce a parasiticidal effect in the cerebrospinal fluid, it was deemed of interest to study a number of other drugs. Silver arsphenamine proved to be even less effective, and "arsenoxide," the trivalent oxidation product of arsphenamine, was still less effective. Methylarsonic acid, the sodium salt of which is sold under the name of "Arrhenal," showed only insignificant efficiency, a fact which is in agreement with some previous work done in this laboratory. (Voegtlin and Homer W. Smith, 1920.) It was, therefore, decided to investigate some drugs which had been previously shown by us to have a greater power of diffusion through tissues. Voegtlin and Thompson (1921) have shown, for instance, that all of the aromatic pentavalent arsenicals pass through the kidney and appear in the urine with much greater rapidity than the corresponding arsenicals in which the arsenic is present in the trivalent form. The pentavalent arsenicals are fairly strong acids, decompose sodium bicarbonate with the liberation of CO_2, and probably exist, at least for some time after their introduction into the body, in an ionized form, in contrast to the arsphenamines which at the hydrogen-ion concentration of the blood and tissues are colloidal. Because of this difference in physico-chemical behavior of the pentavalent arsenicals, it was anticipated that they

might exhibit a greater penetrating power for the tissues. Later, a similar reasoning led also to the study of sulpharsphenamine, the synthesis of which was worked out about a year ago by Voegtlin and Johnson (1922). The ease of tissue penetration of this drug is clearly shown by the fact that it is readily absorbed when injected into the subcutaneous tissue, and its solubility over a considerable

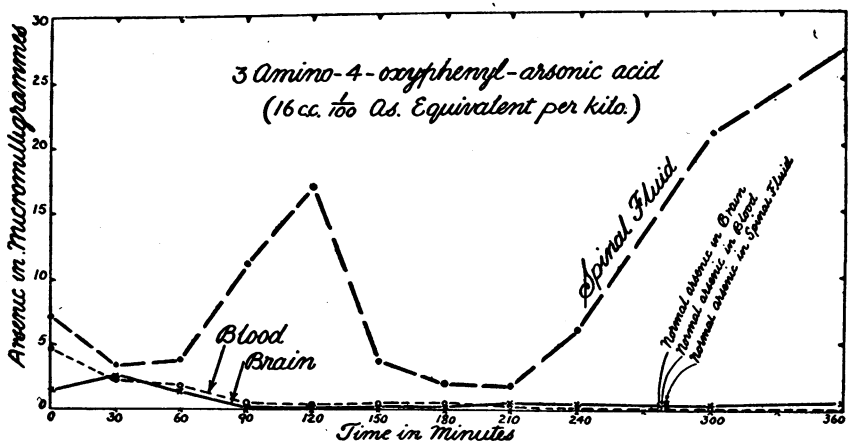

CHART 7.

range of pH is much greater than that of arsphenamine and neoarsphenamine. The introduction of a fairly strongly acid radical into the amino group of arsphenamine evidently imparts to sulpharsphenamine a more electronegative character, thus bringing it nearer in this respect to the pentavalent arsenicals.

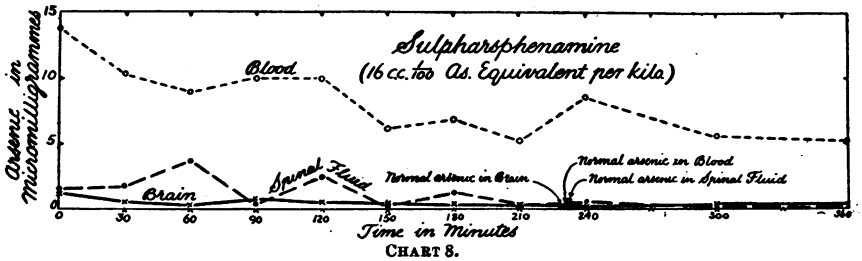

CHART 8.

Atoxyl and arsacetin have been used in the treatment of human trypanosomiasis, and, to a limited extent, in syphilis, with marked therapeutic effect. However, they proved to be rather dangerous drugs, on account of the fact that a certain number of cases subjected to this treatment developed marked visual disturbances and even permanent blindness. Their use has, therefore, been discontinued in the treatment of syphilis since the discovery of arsphenamine. Tryparsamid (sodium salt of N–phenylglycineamid–p–arsonic acid),

a derivative of atoxyl first prepared by Jacobs and Heidelberger and tested biologically by Brown and Pearce, appears to be effective in trypanosome and spirochete infections, and, according to Pearce, has given fairly satisfactory results in the treatment of human trypanosomiasis, though some of the cases treated also exhibited temporary disturbances of vision. The last pentavalent arsenical included in this series, i. e., 3-amino-4-oxyphenylarsonic acid (briefly called "oxyamino"), represents the pentavalent oxidation product of arsphenamine and is presumably formed in the body from arsphenamine. We have observed that all of these pentavalent arsenicals injected into rats in high doses produce the charac-

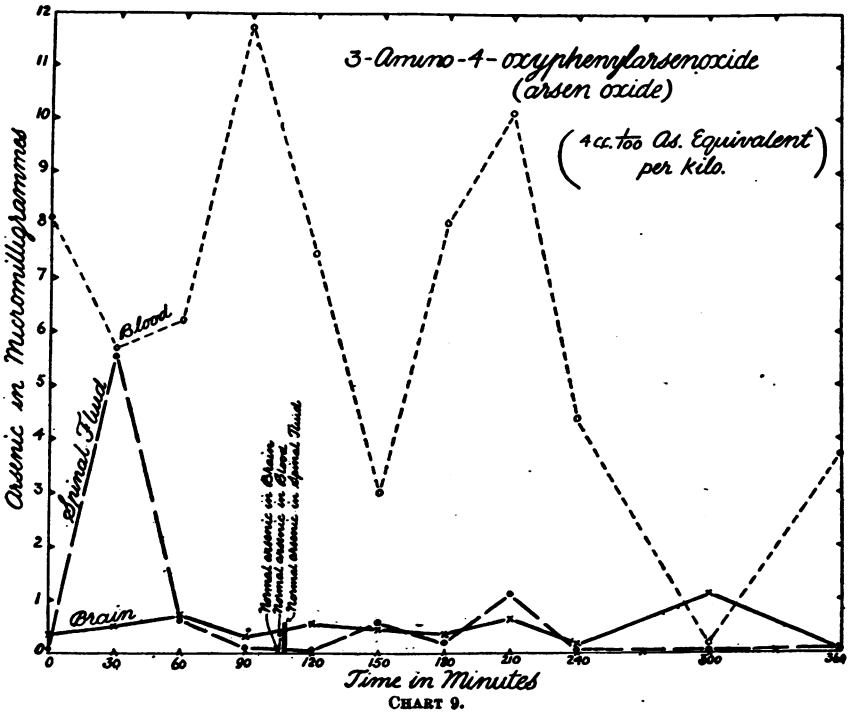

CHART 9.

teristic motor disturbances first described by Ehrlich as occurring in mice (dancing mice). These symptoms, as well as those involving the optic nerve, may be taken as evidence of penetration of arsenic into the nerve tissue, followed by injury, more or less permanent, of certain neurons (neurotropism). In this respect the pentavalent aromatic arsenicals differ from the arsenobenzene derivatives (including sulpharsphenamine), as we have never seen similar nervous manifestations follow the injection of the latter compounds, with the exception of neoarsphenamine, which, in fatal doses, produces marked muscular tremors.

As to the results obtained with these compounds, space does not permit a detailed discussion, but it is evident from Table I and Chart 1 that they are, without exception, more effective than the other compounds with regard to their trypanocidal action on parasites in the cerebrospinal fluid. Sulpharsphenamine, strange as it may seem, is practically as effective as tryparsamid. This is all the more surprising, as the chemical data clearly indicate that during the first six hours following the injection the cerebrospinal fluid arsenic never shows the marked increase found in the case of arsphenamine and neoarsphenamine. So far the chemical and biological evidence with sulpharsphenamine is very contradictory; but it should, of course, be remembered that we have data on the chemical side for a relatively short period of time only, and it may be quite possible that arsenic penetrates at a later period in larger amounts. At any rate the drug produces the desired therapeutic effect; and this, after all, is the essential point to be determined first.

In order to obtain some information as to how well various species of animals will tolerate repeated injections of one of the most effective pentavalent arsenicals, two monkeys, several dogs, cats, rats, and mice were treated twice a week with subcutaneous injections of "oxyamino," with doses ranging from 19 to 76 milligrams per kilo. None of these animals showed signs of poisoning, monkey No. 1 having received a total of 3.1 grams, and monkey No. 2 a total of 1.56 grams per kilo. The two monkeys are still alive and in good condition at the time of this report, more than a year after treatment was begun. The other animals were sacrificed several months after treatment was discontinued. The conclusion seems justified, therefore, that repeated injections of "oxyamino," in doses which produce a marked parasiticidal effect on trypanosomes in the cerebrospinal fluid, are well tolerated.

TABLE III.—*Effect of repeated small doses of "oxyamino" and arsphenamine on arsenic content of brain, blood, and cerebrospinal fluid.*

	3-amino-4-oxyphenylarsonic acid. 4 c. c. 1/100 arsenic equivalent per kilo.															
	Rabbit No.															
	50				51				52				53			
Body weight in grams	3,315				2,510				2,316				2,115			
	July—				July—				July—				July—			
Date of injection (1922)	7	11	14	18	7	11	14	18	7	11	14	18	7	11	14	18
Arsenic injected (micromilligrams)	9,750	10,500	9,750	9,750	7,530	7,800	7,530	7,530	6,750	7,500	6,750	6,750	6,375	6,750	6,375	6,375
Total As injected (micromilligrams)	39,750				30,390				27,750				25,875			
Time killed after final injection (minutes)	100				100				100				100			
Weight in grams of brain	9.00				11.00				9.00				8.00			
Weight in grams of blood	40.00				54.00				25.00				52.00			
Weight in grams of spinal fluid	1.161				0.845				1.215				0.783			
Micromilligrams As found in brain	>1				>1				>1				>1			
Micromilligrams As found in blood	35.00				29.00				18.00				30.00			
Micromilligrams As found in spinal fluid	>1				>1				>1				>1			
Micromilligrams As (calculated) per gram brain	>1				>1				>1				>1			
Micromilligrams As (calculated) per gram blood	0.88				0.54				0.72				0.58			
Micromilligrams As (calculated) per gram spinal fluid	>1				>1				>1				>1			

	Arsphenamine. 4 c. c. 1/100 arsenic equivalent per kilo.															
	Rabbit No.															
	54				55				56				57			
Body weight in grams	2,320				2,122				2,368				2,366			
	July—				July—				July—				July—			
Date of injection (1922)	7	11	14	18	7	11	14	18	7	11	14	18	7	11	14	18
Arsenic injected (micromilligrams)	6,975	7,500	6,975	6,975	6,750	6,750	6,750	6,750	7,125	7,125	7,125	7,125	7,125	7,125	7,125	7,125
Total As injected (micromilligrams)	28,425				27,000				28,500				28,500			
Time killed after final injection (minutes)	100				100				100				100			
Weight in grams of brain	9.00				8.00				8.00				7.00			
Weight in grams of blood	20.00				64.00				37.00				72.00			
Weight in grams of spinal fluid	1.076				0.898				0.799				1.265			
Micromilligrams As found in brain	>1				>1				>1				0.25			
Micromilligrams As found in blood	32.00				80.00				91.00				92.00			
Micromilligrams As found in spinal fluid	>1				>1				>1				>1			
Micromilligrams As (calculated) per gram brain	>1				>1				>1				0.03			
Micromilligrams As (calculated) per gram blood	1.60				1.25				2.46				1.28			
Micromilligrams As (calculated) per gram spinal fluid	>1				>1				>1				>1			

NOTE.—Less than 1 micromilligram represented thus, >1. Rabbits starved 17 hours before each injection. Total injections=16 c. c. 1/100 arsenic equivalent per kilo.

TABLE IV.—*Toxicity of various drugs for rabbits.*

Preparation.	M. L. D.	
	C. c. 1/100 arsenic equivalent solution per kilo.	Milligrams per kilo.
Tryparsamid	373	1,000
Sulpharsphenamine	94	320
3-amino-4-oxyphenylarsonic acid	120	282
Arsacetine	100	281
Atoxyl	25	75
Neoarsphenamine	40	160
Arsphenamine	50	122
Silver arsphenamine	35	140
Arsenoxide	8	20
Methylarsonic acid	100	300

A last series of experiments was carried out to decide the question as to whether or not it was possible to demonstrate any cumulative effect from repeated small doses (4 c.c. 1/100 arsenic equivalent solution per kilo) of "oxyamino" and arsphenamine, respectively. Table III shows that no accumulation of arsenic takes place in the blood, brain, or cerebrospinal fluid. (Compare these figures with the data in Charts 5 and 7.) These results are of interest, as they appear to indicate that a better therapeutic result might be expected from large single doses given at greater intervals than from smaller doses administered more frequently, provided that in both cases the total amount of arsenic used is the same.

COMMENTS.

It may not be amiss to discuss briefly the clinical bearing of these results, of course with a full realization of the fact that results obtained on normal animals, or at least animals not exhibiting marked pathological alterations in their tissues, can not be transferred, without certain reservations, to the treatment of human trypanosomiasis and particularly syphilis. However, it should be emphasized that, as far as the behavior of *Trypanosoma equiperdum* toward the various arsenicals is concerned, no essential differences have so far been discovered between it and *Trypanosoma gambiense* and *Treponema pallidum*. On the contrary, we have shown in many experiments, and our findings have been confirmed by others, that our strain of trypanosomes is killed off by doses similar to those ordinarily used for the treatment of syphilis and human trypanosomiasis. It remains, therefore, to be seen if the relative penetrative power of these arsenicals for the human meninges is approximately of the same order as the one determined by us in the experimental animals. An exhaustive clinical trial of sulpharsphenamine, tryparsamid, and oxyaminophenylarsonic acid would surely be indicated, in view of the fact that

the treatment of neurosyphilis and the treatment of trypanosomiasis in its later stages are such hopeless propositions. As a matter of fact, the preliminary report of Pearce on the treatment of human trypanosomiasis would offer substantial justification for such a trial. It is well to realize fully that Ehrlich's hope (expressed at the time of the introduction of arsphenamine), namely, that this remedy might cure syphilis after a few injections, has not materialized, except, perhaps, in such cases in which treatment is begun immediately or soon after infection. If, on the other hand, the parasites have had an opportunity of causing a generalized infection before intensive treatment is begun, the chances of a real cure of the disease are very poor, indeed, according to the opinion of the best informed syphilographers. From our work we have arrived at the conclusion that this is very probably due to the fact that arsphenamine, neoarsphenamine, and silver arsphenamine do lack the essential penetrative power for the infected tissues, and for this reason they do not reach the last parasites in sufficient amounts to cause their death. The result is a relapse after treatment is discontinued. Whether the drugs suggested by this investigation as being superior will actually prove their superiority in the clinic remains to be seen, but at all events we firmly believe that greater penetrative power is the essential requirement of drugs which are expected to cure and eradicate syphilis.

In conclusion, we wish to point out that whatever arsenical is used, better results will probably be obtained by single large doses approaching closely the maximum tolerated dose, given a week apart, than by smaller doses at shorter intervals. Ehrlich's recommendation of intensive treatment with large doses is therefore still supported by the large body of experimental evidence which has accumulated during the last ten years.

CONCLUSIONS.

1. The penetration of arsenic into the cerebrospinal fluid, following the intravenous injection of a variety of arsenicals, has been studied by (*a*) the chemical analysis of the blood, brain, and cerebrospinal fluid for the presence of arsenic, and (*b*) the parasiticidal action obtainable in the cerebrospinal fluid.

2. A biological method for the study of the permeability of the meninges for various arsenicals is described.

3. From the therapeutic standpoint, the results obtained by means of the biological method possess greater significance than the data secured by chemical analysis, as the former method actually determined the parasiticidal effect of the arsenic which had found its way into the cerebrospinal fluid.

4. Arsphenamine, neoarsphenamine, silver arsphenamine, and some other compounds have a relatively low effectiveness, unless very large doses are used.

5. Sulpharsphenamine is the most effective arsenobenzene derivative studied, and compares favorably with the highly effective aromatic pentavalent arsenicals, which appear to possess much greater therapeutic power than the well-known arsphenamines.

6. A greater therapeutic effect can be expected from large single doses, given at longer intervals, than from smaller doses administered more frequently.

7. It is pointed out that the failure to obtain a complete sterilization of syphilitic patients in more advanced stages is probably due to the deficient penetrative power of arsphenamine, neoarsphenamine, and silver arsphenamine.

8. Sulpharsphenamine, tryparsamid, and 3-amino-4-oxyphenyl arsonic acid are suggested as remedies of superior penetrative power.

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PROGRAM OF THE CONFERENCE OF HEALTH AUTHORITIES.

The following is the program of the twenty-first annual conference of State and Territorial health authorities with the United States Public Health Service, to be held in Washington, D. C., May 16 and 17, 1923:

May 16, 9.30 a. m.

Meeting called to order by the Surgeon General.
Roll call.
Appointment of committees.
Reports of standing committees.
I. Vital Statistics.
- A. The Adoption of a Registration Area for Morbidity Reports, and Practical Uses to be Made of Those Reports.
  Discussion opened by Doctor Crumbine, Kansas.
- B. Ways and Means of Gathering Birth Certificates Which Will Enable States Not Yet in the Registration Area for Births to Secure More Satisfactory Records.
  Discussion opened by Doctor Dowling, Louisiana.

I. Vital Statistics—Continued.
C. Desirability of Requiring Hospitals and Other Institutions to Report Births and Deaths to State Board of Health for Comparison with Records Received from Local Registrars.
Discussion opened by Doctor Chesley, Minnesota.
D. Unity of Effort and Standardization in Relation to the Collection and Distribution of Vital Statistics.
Dr. B. J. Lloyd, United States Public Health Service.
II. The Need for Standardizing or Systematizing State Health Laws, with Special Reference to Those Dealing with Control of Communicable Diseases, Sanitation, Protection of Foods, and the Like.
Discussion opened by Doctor Garrison, Arkansas; Doctor Kendall, Maine; and Doctor French, North Dakota.

May 16, 2 p. m.

III. Measures in Force to Prevent the Introduction and Spread of Yellow Fever and Further Steps Deemed Necessary.
Discussion opened by Doctor Beazley, Texas, and Doctor Turck, Florida.
IV. Progress in Malaria Control and Further Measures Necessary.
Discussion opened by Doctor Welch, Alabama; Doctor Dowling, Louisiana; and Doctor Hayne, South Carolina.
V. Maternity and Infant Hygiene.
A. The New York Plan and Results to Date.
Dr. Florence McKay, Director Division of Child Hygiene, New York.
B. The Pennsylvania Plan and Results to Date.
Dr. Mary Riggs Noble, Chief Division of Child Health, Pennsylvania.
C. The Minnesota Plan and Results to Date.
Dr. E. C. Hartley, Director Division of Child Hygiene, Minnesota.
General discussion.
D. How Should an Average County Deal with Its Maternity and Infant Hygiene Problem and What Results Should It Get?
Dr. Frances Sage Bradley, Director Bureau of Child Hygiene, Arkansas.

May 17, 9.30 a. m.

I. What Should Be the Relationship between State Health Officers and the Public Health Service in Regard to the Investigative Activities of the Service?
Discussion opened by Dr. A. M. Stimson, United States Public Health Service.
II. Problems of Venereal Disease Control.
Discussion opened by Dr. M. J. White, United States Public Health Service.
III. What is the Present Relationship between Health Officers and Practicing Physicians and What Reciprocal Relations Should Be Brought About?
Discussion opened by Doctor Leathers, Mississippi, and Doctor Williams, Virginia.
IV. Cooperative Rural Health Work.
Discussion opened by Doctor Dowling, Louisiana; Doctor Enloe, Missouri.

May 17, 2 p. m.

V. What Corrective Work Among School Children Is Desirable from the Standpoint of Health Officials?
Discussion opened by Doctor Biggs, New York.
VI. What Should Be the Dividing Line in Public Health Instruction and Education between State Departments of Education and State Departments of Health?
Discussion opened by Doctor Osborne, Connecticut.

VII. What Definite Plan Should Be Put into Effect to Insure to Medical Students Knowledge of Public Health Work and an Opportunity to Gain Practical Field Experience?

Discussion opened by Doctor Kelley, Massachusetts, and Doctor Abercrombie, Georgia.

VIII. Report of a Special Study of Secondary Cases of Diphtheria Occurring in Households.

Doctor Kelley, Massachusetts.

Additional subjects for discussion if time permits:

1. Standardization of State Health Budgets with a View to Securing Federal Indorsement of What any State Should Do Regarding Public Health.—Doctor Fahlen, Arizona.
2. Practical Enforcement of Quarantine Laws, with Special Reference to Smallpox and Venereal Diseases, and the Consequences.—Doctor Fahlen, Arizona; Doctor Beazley, Texas.
3. Discontinuing Gaseous Fumigations after Communicable Diseases.—Doctor Conwell, Delaware.
4. Soil Pollution.—Doctor Turck, Florida.
5. Rabies.—Doctor Turck, Florida.
6. Transportation of Communicable Diseases.—Doctor Kendall, Maine.
7. Supervision of Milk Supplies on Interstate Carriers, and Coordination of this Work with State Health Activities on Milk Supplies.—Mr. H. A. Whittaker. Director Division of Sanitation, Minnesota.
8. Preparation of Educational Material, Films, Pamphlets, Etc., Useful for States with Large Rural Population and Few Modern Facilities, such as Hospitals and Clinics.—Doctor Luckett, New Mexico.
9. The Education of Part-time Lay Health Officers.—Doctor French, North Dakota.
10. Use and Abuse of Special Health Drives.—Doctor French, North Dakota.
11. Child Labor, Particularly as Carried on in Southern States, and Its Effect on Public Health.—Doctor Richards, Rhode Island.

NOTE.—At the request of Doctor Olin, camp sanitation will be left for discussion at the meeting of State and Provincial health authorities.

DEATHS DURING WEEK ENDED APRIL 28, 1923.

Summary of information received by telegraph from industrial insurance companies for week ended April 28, 1923, and corresponding week of 1922. (From the Weekly Health Index, May 1, 1923, issued by the Bureau of the Census, Department of Commerce.)

	Week ended Apr. 28, 1923.	Corresponding week, 1922.
Policies in force	52,593,471	49,096,129
Number of death claims	11,162	9,519
Death claims per 1,000 policies in force, annual rate	11.1	10.1

Deaths from all causes in certain large cities of the United States during the week ended April 28, 1923, infant mortality, annual death rate, and comparison with corresponding week of 1922. (*From the Weekly Health Index, May 1, 1923, issued by the Bureau of the Census, Department of Commerce.*)

City.	Week ended Apr. 28, 1923.		Annual death rate per 1,000, corresponding week, 1922.	Deaths under 1 year.		Infant mortality rate, week ended Apr. 28, 1923.[2]
	Total deaths.	Death rate.[1]		Week ended Apr. 28, 1923.	Corresponding week, 1922.	
Total	8,008	14.3	13.3	1,054	992	.....
Akron, Ohio	35	8.8	6.3	4	8	47
Albany, N. Y	40	17.8	24.2	7	3	155
Atlanta, Ga	70	16.4	15.9	17	10	.....
Baltimore, Md	245	16.5	12.3	33	20	97
Birmingham, Ala	79	21.0	10.1	10	5	.....
Boston, Mass	264	17.9	16.4	30	28	86
Bridgeport, Conn	39	14.2	12.3	12	5	166
Buffalo, N. Y	146	14.2	12.4	23	16	96
Cambridge, Mass	40	18.7	18.3	4	0	71
Camden, N. J	44	18.5	18.4	8	8	132
Chicago, Ill	728	13.2	13.3	106	153	.....
Cincinnati, Ohio	129	16.6	14.9	8	9	53
Cleveland, Ohio	181	10.6	9.1	29	22	79
Columbus, Ohio	74	14.8	12.5	7	3	73
Dallas, Tex	38	11.2	12.7	7	4	.....
Dayton, Ohio	42	13.2	9.0	3	8	49
Denver, Colo	78	15.0	14.2	13	6	.....
Detroit, Mich	291	15.2	12.2	48	42	96
Duluth, Minn	28	13.7	.....	4	.....	91
Erie, Pa	22	10.2	12.9	2	4	41
Fall River, Mass	34	14.7	15.5	7	11	99
Flint, Mich	26	11.5	.....	6	.....	119
Fort Worth, Tex	27	9.8	11.8	1	2	.....
Grand Rapids, Mich	35	12.5	11.6	3	3	47
Houston, Tex	33	11.1	12.9	2	10	.....
Indianapolis, Ind	81	12.3	14.9	9	11	69
Jacksonville, Fla	32	16.7	13.9	3	3	.....
Jersey City, N. J	85	14.3	13.1	15	15	101
Kansas City, Kans	40	18.0	13.3	2	3	46
Kansas City, Mo	122	18.1	13.9	16	10	.....
Los Angeles, Calif	192	15.0	15.6	23	18	86
Louisville, Ky	79	16.0	16.0	14	9	151
Lowell, Mass	46	20.8	11.4	6	4	104
Lynn, Mass	27	13.7	.....	5	.....	132
Memphis, Tenn	77	23.6	18.0	6	6	.....
Milwaukee, Wis	131	14.1	10.8	24	21	119
Minneapolis, Minn	110	14.0	12.2	13	13	71
Nashville, Tenn	57	24.5	19.9	9	4	.....
New Bedford, Mass	38	15.2	13.5	4	7	62
New Haven, Conn	36	10.9	16.6	6	4	78
New Orleans, La	130	16.8	12.1	14	7	.....
New York, N. Y	1,555	13.7	13.4	213	206	85
Bronx Borough	174	10.8	10.1	20	27	70
Brooklyn Borough	474	11.5	12.5	79	66	84
Manhattan Borough	750	17.3	15.7	93	94	90
Queens Borough	112	10.9	11.2	18	14	96
Richmond Borough	45	18.4	18.0	3	5	55
Newark, N. J	128	15.2	13.4	20	16	94
Norfolk, Va	19	6.2	7.9	8	6	141
Oakland, Calif	51	11.1	15.0	6	12	77
Omaha, Nebr	64	16.3	12.5	9	4	97
Paterson, N. J	42	15.7	10.9	5	3	80
Philadelphia, Pa	587	15.9	13.3	65	47	84
Pittsburgh, Pa	199	16.9	13.8	37	27	129
Portland, Oreg	59	11 2	10.3	4	3	40
Providence, R. I	82	17.6	14.9	10	10	82
Richmond, Va	49	14.1	13.2	9	5	110
Rochester, N. Y	69	11.3	13.2	9	15	71
St. Louis, Mo	224	14.5	12.8	16	16	.....
St. Paul, Minn	47	10.1	12.4	2	9	18
Salt Lake City, Utah	27	11.2	10.9	2	6	33
San Antonio, Tex	60	16.9	.....	10	.....	.....
San Francisco, Calif	152	14.7	13.3	11	8	66

[1] Annual rate per 1,000 population.

[2] Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1922. Cities left blank are not in the registration area for births.

Deaths from all causes in certain large cities of the United States during the week ended April 28, 1923, infant mortality, annual death rate, and comparison with corresponding week of 1922. (From the Weekly Health Index, May 1, 1923, issued by the Bureau of the Census, Department of Commerce.)—Continued.

City.	Week ended Apr. 28, 1923.		Annual death rate per 1,000, corresponding week, 1922.	Deaths under 1 year.		Infant mortality rate, week ended Apr. 28, 1923.
	Total deaths.	Death rate.		Week ended Apr. 28, 1923.	Corresponding week, 1922.	
Seattle, Wash	65	10.7	9.1	8	6	71
Spokane, Wash	20	10.0	16.5	1	5	22
Springfield, Mass	37	13.4	11.5	5	2	71
Syracuse, N. Y	56	15.8	14.1	6	8	78
Tacoma, Wash	17	8.7	.....	1	.....	25
Toledo, Ohio	51	9.9	11.8	3	9	30
Trenton, N. J	39	16.0	22.1	4	14	68
Washington, D. C	134	16.0	16.1	11	18	63
Wilmington, Del	29	12.8	14.4	4	5	81
Worcester, Mass	47	12.8	13.6	9	4	103
Yonkers, N. Y	24	11.6	12.4	1	7	22
Youngstown, Ohio	24	9.5	14.2	2	6	27

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 STATE SUMMARIES.

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

Reports for Week Ended May 5, 1923.

ALABAMA.

	Cases.
Chicken pox	37
Diphtheria	8
Influenza	84
Malaria	100
Measles	1,351
Mumps	11
Pellagra	19
Pneumonia	66
Scarlet fever	3
Smallpox	3
Tuberculosis	43
Typhoid fever	19
Whooping cough	103

ARIZONA.

Chicken pox	5
Measles	1
Mumps	10
Pneumonia (broncho)	1
Scarlet fever	57
Tuberculosis	29
Typhoid fever	2

ARKANSAS.

Cerebrospinal meningitis	2
Chicken pox	11
Dengue	2
Diphtheria	1
Influenza	40
Malaria	29
Measles	214
Mumps	3
Paratyphoid fever	1
Pellagra	4
Scarlet fever	4
Smallpox	7
Tuberculosis	8
Typhoid fever	6
Whooping cough	6

CALIFORNIA.

Cerebrospinal meningitis:	Cases.
Los Angeles	1
Sonoma County	1
Visalia	1
Diphtheria	146
Influenza	447
Jaundice (epidemic)—Los Angeles	5
Leprosy—San Jose	1
Lethargic encephalitis—Colton	1
Measles	1,127
Scarlet fever	127
Smallpox	41
Typhoid fever	14

COLORADO.

(Exclusive of Denver.)

Chicken pox	23
Diphtheria	41
Measles	37
Mumps	29
Pneumonia	5
Scarlet fever	21
Tuberculosis	16
Typhoid fever	3
Whooping cough	20

CONNECTICUT.

Cerebrospinal meningitis	1
Chicken pox	49
Conjunctivitis	6
Diphtheria	53
German measles	2
Influenza	4
Lethargic encephalitis	3
Measles	199
Mumps	27
Pneumonia (lobar)	19
Poliomyelitis	1
Scarlet fever	56
Smallpox	1
Tuberculosis (all forms)	37
Typhoid fever	2
Whooping cough	52

DELAWARE.

	Cases.
Chicken pox	2
Diphtheria—Wilmington	7
Malaria—Laurel	2
Measles	19
Pneumonia	2
Scarlet fever—Wilmington	4
Tuberculosis	6
Typhoid fever—Milford	1
Whooping cough	3

FLORIDA.

Dengue	1
Diphtheria	6
Leprosy	1
Malaria	7
Pneumonia	5
Rabies	1
Smallpox	4
Trachoma	1
Typhoid fever	22

GEORGIA.

Cerebrospinal meningitis	3
Chicken pox	29
Diphtheria	3
Dysentery (bacillary)	6
German measles	1
Hookworm disease	9
Influenza	36
Malaria	19
Measles	190
Mumps	3
Pellagra	2
Pneumonia	70
Scarlet fever	9
Septic sore throat	5
Smallpox	7
Tuberculosis (pulmonary)	18
Typhoid fever	6
Whooping cough	20

ILLINOIS.

Cerebrospinal meningitis:	
Clark County	1
Chicago	1
Johnson County	1
Mercer County	2
Diphtheria:	
Cook County (including Chicago)	120
Chicago	113
St. Clair County	5
Scattering	34
Influenza:	
Chicago	26
Scattering	65
Lethargic encephalitis:	
Christian County	1
Cook County (including Chicago)	2
Chicago	1
Saline County	1
Pneumonia:	
Chicago	287
Scattering	166

ILLINOIS—continued.

	Cases.
Poliomyelitis:	
Madison County	1
Rock Island County	1
Scarlet fever:	
Cook County (including Chicago)	94
Chicago	87
Scattering	64
Smallpox:	
Cook County	12
Ogle County	4
Scattering	8
Typhoid fever	12
Whooping cough	238

INDIANA.

Cerebrospinal meningitis:	
Kosciusko County	1
Monroe County	1
Diphtheria	57
Measles	1,311
Pneumonia	8
Rabies (in animals)	1
Scarlet fever	100
Smallpox	63
Typhoid fever	9

IOWA.

Diphtheria	13
Scarlet fever	82
Smallpox	17
Typhoid fever	1

KANSAS.

Chicken pox	46
Diphtheria	21
Influenza	2
Lethargic encephalitis	1
Measles	740
Mumps	82
Pneumonia	26
Scarlet fever	29
Smallpox	6
Tuberculosis	102
Typhoid fever	3
Whooping cough	71

LOUISIANA.

Diphtheria	12
Influenza	71
Scarlet fever	4
Smallpox	22
Typhoid fever	16
Whooping cough	7

MAINE.

Chicken pox	6
Diphtheria	2
German measles	10
Measles	56
Mumps	1
Pneumonia	5
Scarlet fever	31
Smallpox	5
Tuberculosis	4
Whooping cough	16

MARYLAND.[1]

	Cases.
Cerebrospinal meningitis	1
Chicken pox	90
Diphtheria	48
Dysentery	1
German measles	5
Influenza	28
Lethargic encephalitis	1
Malaria	3
Measles	1,003
Mumps	69
Ophthalmia neonatorum	2
Pneumonia (broncho)	60
Pneumonia (lobar)	62
Scabies	1
Scarlet fever	139
Septic sore throat	1
Tuberculosis	52
Typhoid fever	7
Whooping cough	129

MASSACHUSETTS.

Cerebrospinal meningitis	4
Chicken pox	120
Conjunctivitis (suppurative)	7
Diphtheria	123
German measles	27
Influenza	7
Lethargic encephalitis	1
Malaria	1
Measles	849
Mumps	239
Ophthalmia neonatorum	17
Pellagra	1
Pneumonia (lobar)	104
Scarlet fever	327
Trachoma	1
Tuberculosis (pulmonary)	153
Tuberculosis (other forms)	22
Typhoid fever	7
Whooping cough	259

MICHIGAN.

Diphtheria	122
Measles	1,350
Pneumonia	246
Scarlet fever	316
Smallpox	12
Tuberculosis	46
Typhoid fever	12
Whooping cough	284

MINNESOTA.

Cerebrospinal meningitis	1
Chicken pox	4
Diphtheria	59
Influenza	1
Lethargic encephalitis	1
Measles	912
Pneumonia	10
Scarlet fever	126
Smallpox	31
Tuberculosis	57
Typhoid fever	5
Whooping cough	14

[1] Week ended Friday.

MISSISSIPPI.

	Cases.
Diphtheria	8
Influenza	224
Scarlet fever	1
Smallpox	2
Typhoid fever	9

MISSOURI.

Cerebrospinal meningitis	2
Chicken pox	52
Diphtheria	71
Epidemic sore throat	2
Influenza	71
Measles	1,736
Mumps	37
Pneumonia	9
Scarlet fever	64
Smallpox	23
Trachoma	12
Tuberculosis	48
Typhoid fever	2
Whooping cough	94

MONTANA.

Diphtheria	5
Scarlet fever	7
Smallpox	11
Rocky Mountain spotted fever:	
Broadview R. D.	1
Montana City	1
Sixteen	1

NEBRASKA.

Chicken pox	5
Diphtheria	11
Influenza—Saline County	26
Measles	104
Mumps	7
Pneumonia	1
Poliomyelitis:	
Antelope County	1
North Platte	1
Scarlet fever	44
Smallpox	2
Tuberculosis	13
Whooping cough	18

NEW JERSEY.

Cerebrospinal meningitis	4
Chicken pox	171
Diphtheria	99
Influenza	17
Measles	896
Pneumonia	107
Poliomyelitis	1
Scarlet fever	143
Typhoid fever	2
Whooping cough	101

NEW MEXICO.

Chicken pox	12
Diphtheria	19
Influenza	33
Measles	23
Mumps	2

NEW MEXICO—continued.

	Cases.
Pneumonia	3
Scarlet fever	7
Septic sore throat	1
Smallpox	10
Tuberculosis	20
Whooping cough	11

NEW YORK.

(Exclusive of New York City and including reports from Buffalo for two weeks.)

Cerebrospinal meningitis	2
Diphtheria	111
Influenza	43
Lethargic encephalitis	4
Measles	2,044
Pneumonia	342
Poliomyelitis	1
Scarlet fever	405
Smallpox	8
Typhoid fever	27
Whooping cough	298

NORTH CAROLINA.

Cerebrospinal meningitis	1
Chicken pox	115
Diphtheria	27
German measles	4
Measles	3,148
Scarlet fever	24
Septic sore throat	2
Smallpox	91
Typhoid fever	13
Whooping cough	528

OREGON.

Chicken pox	17
Diphtheria	11
Measles	2
Pneumonia (deaths, 5)	2
Scarlet fever	13
Smallpox	17
Tuberculosis	6
Typhoid fever	3
Whooping cough	12

SOUTH DAKOTA.

Chicken pox	10
Diphtheria	21
Measles	40
Pneumonia	6
Scarlet fever	30
Smallpox	3
Tuberculosis	1
Whooping cough	6

TEXAS.

Cerebrospinal meningitis	1
Chicken pox	125
Diphtheria	28
Influenza	300
Measles	82
Mumps	31
Paratyphoid fever	1
Pellagra	6

TEXAS—continued.

	Cases.
Pneumonia	33
Scarlet fever	28
Smallpox	23
Trachoma	23
Tuberculosis	115
Typhoid fever	2
Whooping cough	67

VERMONT.

Chicken pox	6
Diphtheria	2
Measles	132
Mumps	32
Pneumonia	3
Poliomyelitis	1
Scarlet fever	11
Typhoid fever	1
Whooping cough	13

VIRGINIA.

Smallpox—Rockingham County	3

WASHINGTON.

Chicken pox	54
Diphtheria	12
Measles	54
Mumps	39
Pneumonia	3
Scarlet fever	29
Smallpox	41
Tuberculosis	10
Typhoid fever	5
Whooping cough	99

WEST VIRGINIA.

Chicken pox	7
Diphtheria	8
Scarlet fever	11
Typhoid fever	3

WISCONSIN.

Milwaukee:	
Chicken pox	12
Diphtheria	20
Measles	29
Pneumonia	5
Poliomyelitis	1
Scarlet fever	196
Smallpox	1
Tuberculosis	20
Whooping cough	34
Scattering:	
Cerebrospinal meningitis	1
Chicken pox	41
Diphtheria	24
German measles	1
Influenza	70
Lethargic encephalitis	1
Measles	1,274
Pneumonia	28
Scarlet fever	191
Smallpox	49
Tuberculosis	23
Typhoid fever	3
Whooping cough	55

Reports for Week Ended April 28, 1923.

DISTRICT OF COLUMBIA.

	Cases.
Chicken pox	27
Diphtheria	14
Influenza	2
Lethargic encephalitis	1
Measles	807
Scarlet fever	28
Smallpox	1
Tuberculosis	26
Whooping cough	62

NORTH DAKOTA.

	Cases.
Chicken pox	1
Diphtheria	6
Measles	102
Pneumonia	7
Scarlet fever	17
Smallpox	17
Tuberculosis	5
Typhoid fever	2

SUMMARY OF CASES REPORTED MONTHLY BY STATES.

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

State.	Cerebrospinal meningitis.	Diphtheria.	Influenza.	Malaria.	Measles.	Pellagra.	Poliomyelitis.	Scarlet fever.	Smallpox.	Typhoid fever.
February, 1923.										
Delaware	.....	14	91	1	218	.....	.....	39	.....	1
March, 1923.										
Alabama	.....	75	1,732	197	2,716	30	3	33	51	95
Delaware	.....	10	29	160	.....	.....	.....	33	.....	1
Maine	2	32	2,304	.....	433	.....	.....	116	.....	7
Montana	.....	53	23	.....	22	.....	.....	61	42	1
North Carolina	7	150	.....	.....	8,502	.....	1	117	540	40

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923.

CEREBROSPINAL MENINGITIS.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding week of the years 1915 to 1922, inclusive. In instances in which data for the full eight years are incomplete, the median is that for the number of years for which information is available.

City.	Median for previous years.	Week ended Apr. 21, 1923.	
		Cases.	Deaths.
California:			
San Francisco	1	2	1
Connecticut:			
Bridgeport	0	1	.....
Illinois:			
Chicago	1	3	3
Maine:			
Lewiston	0	.....	1
Maryland:			
Baltimore	1	1	.....
Massachusetts:			
Beverly	0	1	.....
Fall River	0	1	.....
Haverhill	0	1	.....
Lynn	0	1	1
Minnesota:			
Duluth	0	.....	1
St. Paul	0	1	.....
Winona	.....	1	1
New Jersey:			
East Orange	0	1	.....
Newark	1	.....	1
New York:			
Buffalo	0	.....	1
New York	7	5	3
Ohio:			
Akron	0	1	.....
Barberton	0	.....	1
Sandusky	0	.....	1
Pennsylvania:			
Nanticoke	0	1	.....
Philadelphia	1	1	.....
Rhode Island:			
Providence	0	.....	2
Wisconsin:			
Milwaukee	2	.....	1

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

DIPHTHERIA.

See p. 1037; also Current State summaries, p. 1026, and Monthly summaries by States, p. 1030.

INFLUENZA.

City.	Cases.		Deaths, week ended Apr. 21, 1923.
	Week ended Apr. 22, 1922.	Week ended Apr. 21, 1923.	
Alabama:			
Anniston		4	
Birmingham		14	4
Mobile			1
Montgomery		4	1
Tuscaloosa		2	
California:			
Los Angeles	16	13	1
Oakland		1	1
Pasadena	4		
San Diego	2	3	2
San Francisco	15	17	1
Stockton		2	1
Colorado:			
Denver			3
Greeley	1		
Connecticut:			
Bridgeport	2	1	2
Milford			1
New Britain	2		
New Haven			1
New London		1	
Waterbury	1		
District of Columbia:			
Washington		4	2
Georgia:			
Albany	1		
Atlanta	3	4	1
Augusta	9		
Rome	2		
Savannah		5	1
Illinois:			
Chicago	30	31	11
Cicero		1	
Decatur	1	1	
East St. Louis		1	1
Mattoon			2
Rock Island		1	1
Springfield		2	2
Indiana:			
Anderson			1
Indianapolis			2
Terre Haute			1
Kansas:			
Kansas City		1	
Lawrence		2	1
Topeka			1
Wichita			2
Kentucky:			
Covington			1
Henderson			1
Louisville	3	7	
Louisiana:			
Baton Rouge	4		
New Orleans	3	12	3
Maine:			
Portland			1
Maryland:			
Baltimore		21	1
Cumberland		1	
Massachusetts:			
Boston	2		1
Braintree	1		
Cambridge	1	1	
Everett	1		
Leominster	1		
Lowell		1	
Pittsfield		2	1
Saugus	1		
Somerville	1		
Winthrop	1		
Worcester		1	
Michigan:			
Detroit	3	2	1
Kalamazoo	1		1
Marquette	1		
Minnesota:			
Minneapolis			1
Rochester		1	1
Winona			1
Missouri:			
Kansas City	3	11	10
New Hampshire:			
Manchester			2
New Jersey:			
Atlantic City		1	1
Harrison	5		
Jersey City		1	
Kearny	1		
Montclair		1	
Newark	7	6	2
Trenton		2	2
New York:			
Albany	2	10	
Buffalo	2		
Cohoes		1	
Dunkirk		27	
Glens Falls	1		
Hornell			1
Jamestown		2	1
Middletown		1	
New York	25	73	25
Olean		1	1
Rochester			3
Saratoga Springs	1		
North Carolina:			
Winston-Salem			1
Ohio:			
Akron	1		
Cincinnati			4
Cleveland		1	1
Columbus			3
Findlay	1		1
Mansfield	1		
Marion		1	
Toledo			2
Youngstown			2
Oklahoma:			
Oklahoma			1
Oregon:			
Portland		1	1
Pennsylvania:			
Philadelphia	8	7	9
Rhode Island:			
Providence		2	1
Tennessee:			
Memphis			4
Nashville			5
Texas:			
Dallas	1		4
Fort Worth		3	2
Houston			1
Utah:			
Salt Lake City			2
Virginia:			
Richmond			2
West Virginia:			
Charleston	1		1
Huntington			1
Wisconsin:			
Milwaukee	3		

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

LEPROSY.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
California—			Kentucky:		
Sacramento	1		Louisville	1	

LETHARGIC ENCEPHALITIS.

Kansas:			Ohio:		
Topeka	1	2	Coshocton	1	
Minnesota:					
Winona	1				

MALARIA.

Alabama:			Illinois:		
Anniston	1		Chicago	1	
Birmingham	1		Louisiana:		
Mobile	1		New Orleans	3	
Arkansas:			Ohio:		
Little Rock	7		Norwood	1	
Florida:			Tennessee:		
Tampa	1		Memphis	1	
Georgia:					
Atlanta	1				
Rome	2				
Savannah	2				

MEASLES.

See p. 1037; also Current State summaries, p. 1026, and Monthly summaries by States, p. 1030.

PELLAGRA.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
Alabama:			South Carolina:		
Birmingham	2	1	Charleston		1
Georgia:			Columbia		1
Atlanta		2	Tennessee:		
Rome	1		Memphis		1
North Carolina:			Nashville		1
Greensboro		1			
Wilmington		1			

PNEUMONIA (ALL FORMS).

City.	Cases.	Deaths.	City.	Cases.	Deaths.
Alabama:			California—Continued.		
Anniston	6		Santa Ana		1
Birmingham	32	12	Stockton	2	1
Mobile		1	Colorado:		
Montgomery		3	Denver		4
Arkansas:			Pueblo		1
Little Rock	4		Connecticut:		
California:			Bridgeport	4	1
Glendale		1	Hartford		3
Long Beach		1	Manchester	1	
Los Angeles	34	11	Milford		1
Oakland	3		New Haven		4
Pasadena		2	New London		2
Sacramento		2	Waterbury		3
San Bernardino		3	District of Columbia:		
San Diego	4	2	Washington		25
San Francisco	16	6			

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

PNEUMONIA (ALL FORMS)—Continued.

City.	Cases.	Deaths.
Georgia:		
Atlanta		12
Brunswick		1
Savannah		5
Illinois:		
Aurora		2
Bloomington		2
Champaign	1	
Chicago	316	96
Cicero	4	1
Danville	3	1
Decatur	2	1
East St. Louis		5
Elgin	2	
Evanston	3	
Freeport	1	
Jacksonville		1
Kewanee	4	3
Mattoon		1
Oak Park	4	1
Peoria		2
Quincy	6	2
Rockford		2
Rock Island		3
Springfield		4
Indiana:		
East Chicago		4
Fort Wayne		3
Gary		4
Hammond		2
Indianapolis		15
Kokomo		1
Michigan City		2
Mishawaka		1
South Bend		2
Terre Haute		3
Iowa:		
Burlington	4	1
Council Bluffs		2
Kansas:		
Fort Scott		1
Hutchinson	1	
Kansas City	13	
Lawrence		1
Topeka	8	1
Wichita		3
Kentucky:		
Covington		4
Louisville	28	13
Louisiana:		
New Orleans	12	9
Maine:		
Auburn		2
Bangor		2
Bath		1
Biddeford		1
Lewiston	3	2
Portland		3
Sanford		1
Maryland:		
Baltimore	58	36
Cumberland	12	2
Frederick	1	
Massachusetts:		
Arlington		1
Attleboro		1
Boston		37
Braintree		1
Brockton		1
Cambridge	10	8
Chelsea		2
Chicopee	1	
Clinton	1	
Easthampton	1	
Fall River		3
Fitchburg		1
Framingham	2	1
Greenfield		1
Haverhill	6	
Holyoke	2	
Massachusetts—Continued.		
Lowell		8
Lynn		6
Malden		2
Medford	2	
New Bedford		10
Newton		2
North Adams		3
Northampton	1	
Peabody		1
Pittsfield		1
Plymouth		1
Quincy	1	
Salem	1	
Somerville		3
Springfield	4	1
Taunton		1
Wakefield	1	
Watertown		1
Woburn		1
Worcester		4
Michigan:		
Alpena	1	
Battle Creek	1	
Detroit	75	55
Flint		8
Grand Rapids	13	6
Hamtramck		1
Highland Park	10	
Jackson		2
Kalamazoo	4	1
Marquette	1	
Muskegon	3	2
Pontiac	4	1
Port Huron		1
Saginaw		4
Minnesota:		
Duluth		7
Hibbing	4	
Minneapolis		7
Rochester		1
St. Paul		8
Winona		2
Missouri:		
Kansas City	21	16
St. Joseph		3
Springfield		1
Montana:		
Great Falls		1
Missoula	3	2
Nebraska:		
Lincoln		1
Omaha		5
New Hampshire:		
Keene		1
Nashua		1
New Jersey:		
Atlantic City		1
Bayonne	1	
Bloomfield	2	
Clifton		1
East Orange	2	
Elizabeth		3
Englewood	1	
Garfield	4	
Hackensack		2
Harrison	2	
Hoboken		4
Jersey City	5	
Kearny	2	
Long Branch	1	
Montclair	2	1
Morristown		3
Newark	43	16
Orange	4	2
Passaic		6
Paterson	3	
Perth Amboy		3
Plainfield		1
Trenton		3
West Hoboken		2

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

PNEUMONIA (ALL FORMS)—Continued.

City.	Cases.	Deaths.
New Mexico:		
Albuquerque	.....	2
New York:		
Albany	20	.....
Auburn	1	.....
Buffalo	28	20
Cohoes	1	.....
Cortland	2	.....
Elmira	4	1
Hornell	7	.....
Ithaca	4	.....
Jamestown	4	1
Lackawanna	4	.....
Lockport	.....	3
Middletown	1	.....
Mount Vernon	2	.....
New York	297	163
Newburgh	.....	5
Niagara Falls	3	.....
North Tonawanda	1	.....
Olean	2	.....
Peekskill	.....	2
Port Chester	6	2
Poughkeepsie	7	.....
Rochester	16	6
Schenectady	4	.....
Syracuse	7	4
Troy	5	2
Watertown	3	.....
Yonkers	.....	11
North Carolina:		
Durham	.....	3
Raleigh	.....	1
Wilmington	.....	2
Winston-Salem	.....	4
Ohio:		
Akron	3	.....
Barberton	2	.....
Cambridge	.....	1
Canton	1	.....
Chillicothe	.....	3
Cincinnati	.....	12
Cleveland	40	23
Columbus	.....	12
Coshocton	1	.....
Dayton	1	.....
East Cleveland	.....	4
East Youngstown	.....	1
Findlay	.....	1
Fremont	1	.....
Lancaster	.....	1
Lorain	3	.....
Mansfield	4	1
Marion	1	.....
Martins Ferry	.....	1
Newark	.....	2
Salem	.....	1
Sandusky	2	1
Springfield	.....	3
Ohio—Continued.		
Toledo	.....	5
Youngstown	.....	9
Zanesville	.....	3
Oklahoma:		
Oklahoma	.....	3
Oregon:		
Portland	.....	5
Pennsylvania:		
Philadelphia	101	83
Rhode Island:		
Cranston	.....	3
Cumberland	.....	1
Pawtucket	.....	5
Providence	.....	8
South Carolina:		
Charleston	.....	5
Columbia	.....	2
Greenville	.....	1
South Dakota:		
Sioux Falls	.....	1
Tennessee:		
Memphis	.....	9
Nashville	.....	14
Texas:		
Austin	.....	1
Beaumont	.....	3
Dallas	.....	6
Fort Worth	.....	1
Galveston	.....	1
Houston	.....	3
San Antonio	.....	11
Waco	.....	1
Utah:		
Salt Lake City	.....	1
Vermont:		
Burlington	.....	3
Virginia:		
Lynchburg	.....	4
Norfolk	.....	2
Petersburg	.....	3
Portsmouth	.....	1
Richmond	.....	9
Roanoke	2	.....
West Virginia:		
Charleston	.....	2
Huntington	.....	4
Morgantown	1	.....
Parkersburg	.....	1
Wheeling	.....	5
Wisconsin:		
Beloit	.....	2
Eau Claire	1	.....
Kenosha	.....	3
Milwaukee	.....	10
Oshkosh	.....	3
Racine	.....	4
Superior	.....	1
West Allis	1	.....

POLIOMYELITIS (INFANTILE PARALYSIS).

The column headed "Median for previous years" gives the median number of cases reported during the corresponding week of the years 1915 to 1922, inclusive. In instances in which data for the full eight years are incomplete, the median is that for the number of years for which information is available.

City.	Median for previous years.	Week ended Apr. 21, 1923.	
		Cases.	Deaths.
Illinois:			
Aurora	0	1	1
Champaign	0	1	.....
Chicago	0	1	.....
Springfield	0	.....	1
Maryland:			
Baltimore	0	1	.....
New York:			
New York	1	2	2

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

RABIES IN ANIMALS.

City.	Cases.	City.	Cases.
California:		New Jersey:	
Los Angeles	13	Summit	1
Kentucky:		Virginia:	
Louisville	1	Alexandria	1
Missouri:			
Kansas City	3		

SCARLET FEVER.

See p. 1037; also Current State summaries, p. 1026, and Monthly summaries by States, p. 1030.

SMALLPOX.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding week of the years 1915 to 1922, inclusive. In instances in which data for the full eight years are incomplete, the median is that for the number of years for which information is available.

City.	Median for previous years.	Week ended Apr. 21, 1923.		City.	Median for previous years.	Week ended Apr. 21, 1923.	
		Cases.	Deaths.			Cases.	Deaths.
Alabama:				North Carolina:			
Anniston	0	25	.....	Durham	1	3	.....
California:				Greensboro	0	12	.....
Los Angeles	1	4	.....	Winston-Salem	1	22	.....
San Francisco	3	1	.....	Ohio:			
Florida:				Columbus	0	6	.....
Key West	.....	1	.....	Dayton	1	1	.....
Georgia:				Piqua	0	1	.....
Atlanta	4	6	.....	Sandusky	0	1	.....
Savannah	1	1	.....	Toledo	0	20	.....
Valdosta	1	3	.....	Oklahoma:			
Illinois:				Oklahoma	6	6	.....
Chicago	2	1	1	Tulsa	2	2	.....
Cicero	.....	7	.....	Oregon:			
Indiana:				Portland	3	13	.....
Anderson	0	1	.....	Pennsylvania:			
Fort Wayne	3	7	.....	Farrell	0	1	.....
Gary	0	11	.....	Reading	.....	1	.....
Huntington	0	2	.....	South Carolina:			
Indianapolis	10	2	.....	Columbia	0	1	.....
Michigan City	0	2	.....	Greenville	0	2	.....
Muncie	0	1	.....	Tennessee:			
Iowa:				Knoxville	3	29	.....
Burlington	2	2	.....	Texas:			
Council Bluffs	1	1	.....	Austin	0	1	.....
Davenport	8	9	.....	Fort Worth	3	1	.....
Des Moines	3	4	.....	Vermont:			
Michigan:				Burlington	0	1	.....
Battle Creek	0	2	.....	Virginia:			
Detroit	12	1	.....	Norfolk	0	2	.....
Flint	1	1	.....	Washington:			
Grand Rapids	1	3	.....	Bellingham	0	1	.....
Highland Park	0	4	.....	Everett	0	1	.....
Jackson	0	2	.....	Seattle	9	5	.....
Kalamazoo	0	1	.....	Spokane	10	11	.....
Sault Ste. Marie	0	1	.....	Tacoma	1	2	.....
Minnesota:				Wisconsin:			
Duluth	1	6	.....	Beloit	0	1	.....
St. Paul	9	4	.....	Eau Claire	0	1	.....
Missouri:				Kenosha	0	10	.....
St. Louis	11	2	.....	Madison	1	1	.....
Montana:				Oshkosh	2	1	.....
Missoula	1	2	.....	Racine	0	4	.....
				Stevens Point	.....	2	.....
				Superior	1	5	.....

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

TETANUS.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
California:			North Carolina:		
San Francisco	1	1	Greensboro		1
Minnesota:			Oregon:		
Minneapolis	1	1	Portland	1	
Missouri:			Virginia:		
St. Louis	1	1	Roanoke		1
New Jersey:					
Trenton		1			

TUBERCULOSIS.

See p. 1037; also Current State summaries, p. 1026.

TYPHOID FEVER.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding week of the years 1915 to 1922, inclusive. In instances in which data for the full eight years are incomplete, the median is that for the number of years for which information is available.

City.	Median for previous years.	Week ended Apr. 21, 1923.		City.	Median for previous years.	Week ended Apr. 21, 1923.	
		Cases.	Deaths.			Cases.	Deaths.
Alabama:				Missouri:			
Montgomery	0	1		Independence	0	2	1
California:				Kansas City	0	1	1
Long Beach	0	1		Montana:			
Oakland	0	1		Billings	0	1	
Sacramento	0	2		New Jersey:			
Florida:				Elizabeth	0	2	
Key West			1	Newark	0	1	
St. Petersburg		1	1	Trenton	1		1
Tampa	0	1		New York:			
Georgia:				Albany	1	1	
Brunswick	0	1		New York	10	13	4
Illinois:				Rochester	0	1	
Chicago	3	1		North Carolina:			
Indiana:				Wilmington	0		1
Michigan City	0	1		Ohio:			
Terre Haute	0	1		Cincinnati	1	1	
Kansas:				Cleveland	2	4	1
Wichita	0		1	Columbus	0	1	
Kentucky:				Mansfield	0	1	
Covington	0	5		Zanesville	0	1	
Louisiana:				Pennsylvania:			
New Orleans	1	3	1	Harrisburg	0	1	
Maine:				Norristown	0	1	
Portland	0	1		Philadelphia	8	4	1
Maryland:				Pittsburgh	2	1	
Baltimore	3	2		Shamokin	0	2	
Massachusetts:				Washington	0	1	
Boston	2	1	1	Wilkinsburg	0	1	
Haverhill	0	1		Texas:			
Newburyport	0	1		Fort Worth	0	1	1
Southbridge	0	1		Waco	0	1	
Michigan:				Virginia:			
Detroit	3	1		Petersburg	0	1	
Grand Rapids	0	1		Roanoke	0	2	
Highland Park	0	2		West Virginia:			
Minnesota:				Wheeling	0	1	
Minneapolis	1	3		Wisconsin:			
Rochester	0		1	Janesville	0	1	
St. Paul	0	1		Milwaukee	1	1	
				Wausau	0	1	

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama:										
Anniston	17,734				7		2			
Birmingham	178,806	54	2		143		1		13	6
Mobile	60,777	16			8					1
Montgomery	43,464	21	1		309				2	4
Tuscaloosa	11,996				41					
Arkansas:										
Fort Smith	28,870		1		2		1			
Little Rock	65,142		1		100				1	
North Little Rock	14,048				30					
California:										
Alameda	28,806	3	3		12		3			
Eureka	12,923	6			7		4		2	
Glendale	13,536	15								3
Long Beach	55,593	19	3		29		2		2	
Los Angeles	576,673	195	43	4		2			131	23
Oakland	216,261		16		104		8		6	1
Pasadena	45,354	19	2		14		4	1	3	2
Richmond	16,834	2	1		7		3			
Riverside	19,341	5					1			1
Sacramento	65,908	18	2		7		10		2	1
San Bernardino	18,721	13	1		13		1		1	
San Diego	74,683	28	2		65		7		7	3
San Francisco	506,676	107	41	3	37	2	26		26	15
Santa Ana	15,485	8	2		3					
Santa Barbara	19,441	2				1				1
Santa Cruz	10,917	3								
Stockton	40,296	13			100	1	3		2	1
Vallejo	21,107	2					2			
Colorado:										
Denver	256,491	69	15		376		19	1		15
Pueblo	43,050	10	2				2		1	1
Trinidad	10,906	0	2		1		2			
Connecticut:										
Bridgeport	143,555	37	2	1	6	2	13		4	2
Bristol	20,620	8					1			1
Fairfield (town)	11,475	4			17		1			
Hartford	138,036	54	4		1		7		8	7
Manchester (town)	18,370	5	1							
Milford (town)	10,193	3			13		1		1	
New Haven	162,537	44	2	1	33	1	3		8	2
New London	25,688	18	2	1	28				1	2
Waterbury	91,715	25	2		25	3	7		4	2
District of Columbia:										
Washington	437,571	163	10	1	672	3	42		28	9
Florida:										
Key West	18,749	6								
St. Petersburg	14,237	12			3					
Tampa	51,608	12								3
Georgia:										
Albany	11,555				75					
Atlanta	200,616	81	2		16		7		4	5
Brunswick	14,413	2	1		2					1
Macon	52,995		2		62		1			
Rome	13,252				2					
Savannah	83,252	26			12				5	7
Valdosta	10,783	4								
Idaho:										
Boise	21,393	7					2			
Pocatello	15,001	8								1
Illinois:										
Alton	24,682		2		67					
Aurora	36,397	21	2		58		1		4	1
Bloomington	28,725	6			8		1			
Blue Island	11,424	5			2					
Centralia	12,491	5			4					
Champaign	15,873		1		7					
Chicago	2,701,705	719	95	4	947	10	98		233	42
Cicero	44,995	3			37		4			
Danville	33,776	12			20				4	1
Decatur	43,818	11	6	1	11		2			
East St. Louis	66,767	27	2	1	9				2	2
Elgin	27,454	7			24					

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Illinois—Continued.										
Evanston	37,234	8			100		4		2	
Forest Park	10,768		2		24					
Freeport	19,669	8			47		1	1	1	1
Galesburg	23,834	4								
Jacksonville	15,713	6								
Kewanee	16,026	9			1				1	1
La Salle	13,050	3								1
Mattoon	13,552	5			13					
Oak Park	39,858	12	1		19		4		2	1
Peoria	76,121	20			49		6			
Quincy	35,978	14								
Rock Island	35,177	17			3				1	1
Rockford	65,651	22	2	1	13		5			1
Springfield	59,183	20	1		26					
Indiana:										
Anderson	29,767	5			2					
Crawfordsville	10,139	2			2		1			1
East Chicago	35,967	10	4	1	28				2	2
Elwood	10,790	2								
Fort Wayne	86,549	22					11			1
Frankfort	11,585	3			2		1			
Gary	55,378	18			50	4	5			
Hammond	36,004	10			14		1			
Huntington	14,000	1			2		1			
Indianapolis	314,194	114	12		805		5		2	11
Kokomo	30,067	7			2		1			
La Fayette	22,486	6								
Laporte	15,158	2			2					
Logansport	21,626	6			20					1
Michigan City	19,457	5			1		1			
Mishawaka	15,195	2			1		3			
Muncie	36,524	8	1		11					
South Bend	70,983	23	5	1	1		6		6	1
Terre Haute	66,083	19			169		1			
Iowa:										
Burlington	24,057	11	2		18		1			
Cedar Rapids	45,566						1			
Council Bluffs	36,162	13	1	1						
Davenport	56,727		2							
Des Moines	126,468		3				54			
Dubuque	39,141				7					
Iowa City	11,267		2		1		3			
Muscatine	16,068	6			8					1
Waterloo	36,230				61		3			
Kansas:										
Coffeyville	13,452	2			95					
Fort Scott	10,693	4					1			
Hutchinson	23,298								2	
Kansas City	101,177		1		85		8		11	
Lawrence	12,456	5							5	1
Parsons	16,028	4			19					
Topeka	50,022	20	1		4		2		4	
Wichita	72,217	29	1		8		3			2
Kentucky:										
Covington	57,121	19	1		2				1	2
Henderson	12,169	3			3					
Louisville	234,891	101	4		93		2		20	14
Owensboro	17,424				1				2	
Paducah	24,735				1					
Louisiana:										
New Orleans	387,219	121	4		4		1		24	17
Maine:										
Auburn	16,985	4			3		5			
Bath	14,731	3					1		1	
Biddeford	18,008	10			1					
Lewiston	31,791	17			5		9			1
Portland	69,272	13	2		50		4			1
Sanford (town)	10,691	3			34					
Maryland:										
Baltimore	733,826	243	27	4	522	3	81		42	21
Cumberland	29,837	19			42	1	1			1
Frederick	11,066	2	1							

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Massachusetts:										
Adams (town)	12,967	2			9					
Amesbury (town)	10,036	3								
Arlington (town)	18,665	5			22		2		1	
Attleboro	19,731	3							5	
Belmont (town)	10,749	1			17					1
Beverly	22,561	3	1				1			
Boston	748,060	244	56	3	150		87	2	33	13
Braintree (town)	10,580	5			7		2			1
Brockton	66,254	13	1		59		1		3	1
Brookline	37,748	5			8		2			
Cambridge	109,694	34	12	1	70	2	11		5	3
Chelsea	43,184	15	3		1		8		1	
Chicopee	36,214	8					4		3	
Clinton	12,979	2	1						1	
Danvers	11,108						1		1	
Dedham	10,792	3								
Easthampton	11,261		1		1					
Everett	40,120	6								
Fall River	120,485	26	1		9		4		2	1
Fitchburg	41,029	11			2					
Framingham	17,033	6			2		6			
Gardner	16,971	2	1							
Greenfield	15,462	6					1			
Haverhill	53,884	18			12		13			1
Holyoke	60,203	17	1	1	1		16		1	2
Leominster	19,744	4							2	
Lowell	112,759	40		1	39		12		8	1
Lynn	99,148	28	3	1	6		5		2	
Malden	49,103	15	1		17		9		1	
Medford	39,038	8	1		15					
Melrose	18,204	3	1		4				1	
Methuen	15,189	3			6		1			
New Bedford	121,217	31			6				11	3
Newburyport	15,618	5	1	1	4				1	1
Newton	46,054	13	1		5		4		2	
North Adams	22,282	8								
Northampton	21,951	6					6		1	1
Northbridge	10,174	1								
Peabody	19,552	5							1	
Pittsfield	41,763	12	1	2			7			
Plymouth	13,045	2								
Quincy	47,876	11	3	1	7		10		1	
Salem	42,529	1	2	1	1		1			
Somerville	93,091	21	3		20	1	9		3	
Southbridge	14,245	2								
Springfield	129,614	31	2				16		5	2
Taunton	37,137	13			6		10		3	1
Wakefield	13,025	2	1		8		3			
Watertown	21,457	3	3		1		4			
Webster	13,258	6								
Westfield	18,604	5					1			
Winchester	10,485				6					
Winthrop	15,455	5			29					
Woburn	16,574	9								1
Worcester	179,754	52	4		83		23			2
Michigan:										
Alpena	11,101		1				1			
Ann Arbor	19,516	14			1				1	
Battle Creek	36,164				19		2		1	
Benton Harbor	12,233	2	3		7					
Detroit	993,678	294	52	5	180	1	134	5	81	18
Flint	91,599	20	10		8		7			1
Grand Rapids	137,634	48	5	1	54		7		6	2
Hamtramck	48,615	11	3	1			1		2	
Highland Park	46,499	14	2		46		9		1	
Holland	12,183						3			
Jackson	48,374	17			69		4		2	1
Kalamazoo	48,487	21	1		2		3		2	
Marquette	12,718	3			3					
Muskegon	36,570	7	1		15		3			
Pontiac	34,273	12			28		9		4	
Port Huron	25,944	10			6		7			
Saginaw	61,903	28	2				16		9	
Sault Ste. Marie	12,096	6					1		1	

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Minnesota:										
Duluth	98,917	36	1		45		6		4	5
Faribault	11,089	2			1		1			
Hibbing	15,089				6		6			
Minneapolis	380,582	99	7		234	1	29	3	23	8
Rochester	13,722	22			1		1		1	
St. Cloud	15,873		1		8		2			
St. Paul	234,698	59	8		417	2	43	1	18	2
Virginia	14,022						6			
Winona	19,143	6	1				1			
Missouri:										
Cape Girardeau	10,252	1							1	1
Independence	11,686				2					
Joplin	29,902				1		1			
Kansas City	324,410	111	9	1	297	3	21		25	14
Saint Joseph	77,939	33	1		2		3			
Saint Louis	772,897	234	35	1	1,186	1	23		42	18
Springfield	39,631	13								1
Montana:										
Anaconda	11,668	0								
Billings	15,100	3	1				1			
Great Falls	24,121	11	1	1						2
Helena	12,037	8								
Missoula	12,668	7	1				3		1	
Nebraska:										
Lincoln	54,948	9	1							
Omaha	191,601	55	5				2			3
Nevada:										
Reno	12,016	7			1					
New Hampshire:										
Berlin	16,104	5							2	
Concord	22,167	15			4		5			1
Dover	13,029	2			2					
Keene	11,210	6	1							
Manchester	78,384	24	3	2	6					
Nashua	28,379	10			10		5			
New Jersey:										
Asbury Park	12,400	1			20					
Atlantic City	50,707	13	1		9		4			
Bayonne	76,754		5				2			
Bloomfield	22,019	4			7		4		1	
Clifton	26,470	6	1		6					1
East Orange	50,710	4			8		1			
Elizabeth	95,783		8	1	9		6		6	
Englewood	11,627	3			5					
Garfield	19,381	1	1		1					
Hackensack	17,667	5			8		7			
Harrison	15,721		1		2					
Hoboken	68,166	15	1				1		1	1
Jersey City	298,103		2		17		17		15	
Kearny	23,724	6			23		1			2
Long Branch	13,521	3			1		2			
Montclair	28,810	7	1		31		3			
Morristown	12,548	8					2		2	
Newark	414,524	122	3		162		28		31	7
Orange	33,268	12	2		12				2	
Passaic	63,841	21	2		14		4		1	1
Paterson	135,875		10		35		7		6	
Perth Amboy	41,707	7	2		2		3		2	
Phillipsburg	16,923	3								
Plainfield	27,700	5			3		3		1	
Summit	10,174	1	1							
Trenton	119,289	40	17	1	2		4		7	2
Union (town)	20,651				1		1			
West Hoboken	40,074	3					5			
West New York	29,926	3			10				1	
West Orange	15,573	3			17				1	1
New Mexico:										
Albuquerque	15,157	6	1						3	2
New York:										
Albany	113,344		2		20		7		8	
Amsterdam	33,524	8	1		1		1			1
Auburn	36,192	16			12		1		1	
Buffalo	506,775	153	8	4	237	5	38	3	28	11

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
New York—Continued.										
Cohoes	22,987	4			1		1		1	1
Cortland	13,294	5	1		4		2			
Dunkirk	19,336	3			3				4	
Elmira	45,393						1			
Geneva	14,648	3								
Hornell	15,025	5			11					
Hudson	11,745	4					1		2	1
Ithaca	17,004	7			3		1			
Jamestown	38,917	10			2				12	
Lackawanna	17,918	6	1		4					
Little Falls	13,029	1								
Lockport	21,308	8	3							
Middletown	18,420				40					
Mount Vernon	42,726	14	1		1		1		3	
New York	5,620,048	1,380	193	16	403	7	288	7	[1] 283	[1] 109
Newburgh	30,366	27							3	2
Niagara Falls	50,760	15			8		7			1
North Tonawanda	15,482	5			39		7			1
Olean	20,506	6	1		80		22			
Peekskill	15,868	6			72		11		5	2
Port Chester	16,573	6								
Poughkeepsie	35,000	12			1		1		5	1
Rochester	295,750	97	6		50	5	3		11	8
Rome	26,341	9					1			1
Saratoga Springs	13,181	9			1				2	
Schenectady	88,723	14			15		4		3	1
Syracuse	171,717	47	7	1	90		28		6	1
Troy	72,013	20	1		1				1	
Watertown	31,285	9	1		1		2		1	1
White Plains	21,031	3			3		5		3	
Yonkers	100,176	29	6		5		9			2
North Carolina:										
Durham	21,719	8			123				1	
Greensboro	[2] 43,525	6			14					
Raleigh	24,418	10			103		1			1
Rocky Mount	12,742	2								
Wilmington	33,372	14								
Winston-Salem	48,395	16			8		1		4	3
North Dakota:										
Fargo	21,961	0					3			
Ohio:										
Akron	208,435	37	2		104		5		3	
Ashtabula	22,082	13			2		3		1	1
Barberton	18,811	5			15		2			
Bucyrus	10,425	2			10					
Cambridge	13,104	3								1
Canton	87,091	2	1		12		2		1	2
Chillicothe	15,831	6			8					
Cincinnati	401,247	132	6		43		9		12	16
Cleveland	796,841	193	25	4	334	1	128	4	39	20
Cleveland Heights	15,236				103		6			
Columbus	237,031	84	6	1	220	2	6		5	2
Coshocton	10,847		1		1					
Dayton	152,559	49	1		52		13		1	
East Cleveland	27,292	8			54		17			
East Youngstown	11,237	5								
Findlay	17,021	12			24				2	
Fremont	12,468	6			7					
Hamilton	39,675	13			19		1			
Kenmore	12,683				7					
Lancaster	14,706	8	1		3					
Lorain	37,295	4	4		34		10		1	
Mansfield	27,824	11			15					1
Marion	27,891				3		1			
Martins Ferry	11,634	4							1	
Middletown	23,594	3			21				1	
Newark	26,718	10			12					
Niles	13,080	2	1		15					
Norwood	24,966	3			7					
Piqua	15,044	10	2	1						1
Salem	10,305	4								1
Sandusky	22,897	7			39				1	1

[1] Pulmonary only.

[2] Estimated as of April, 1923.

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Ohio—Continued.										
Springfield	60,840	18	1		120		1			
Steubenville	28,508	7	1		4				3	
Toledo	243,164	69	4		17		34		7	12
Youngstown	132,358		16	1	23		7		3	1
Zanesville	29,569	9							1	
Oklahoma:										
Oklahoma	91,295	29	2		8		4			1
Tulsa	72,075		1		19		1			
Oregon:										
Portland	258,288	60	8		1		3			3
Pennsylvania:										
Allentown	73,502		6		32		12			
Altoona	60,331		3		7		3			
Ambridge	12,730				3		1			
Beaver Falls	12,802				4					
Berwick	12,181						1			
Bethlehem	50,358		5		60		3			
Braddock	20,879		1		3					
Bradford	15,525				7					
Butler	23,778				15					
Carbondale	18,640						1			
Carlisle	10,916				2		1			
Carnegie	11,516						2			
Carrick	10,504				1					
Chambersburg	13,171				7		1			
Charleroi	11,516				8					
Chester	58,030		1		6					
Coatesville	14,515				1		1			
Connellsville	13,804				51					
Donora	14,131		1		3					
Dubois	13,681		5							
Easton	33,813		1		9					
Erie	93,372		2		61		7		7	
Farrell	15,586		1		44					
Harrisburg	75,917		1		28		6			
Hazelton	32,277				3					
Homestead	20,452		1		3					
Jeannette	10,027				10					
Johnstown	67,327		3		17		8			
Lancaster	53,150		1		56		3			
Lebanon	24,643		3		9				1	
McKee's Rocks	16,713				7		1			
McKeesport	46,781				4				1	
Monessen	18,179				14					
Mount Carmel	17,469						1		3	
Nanticoke	22,614				20		1			
New Castle	44,938				1					
New Kensington	11,987		1		2				1	
Norristown	32,319		2		2					
Oil City	21,274		1		47					
Olyphant	10,236		1							
Philadelphia	1,823,779	563	60	3	117	4	51	1	97	49
Phoenixville	10,484						1			
Pittsburgh	588,343		17		267		24		22	
Pittston	18,497				1					
Pottstown	17,431				3					
Pottsville	21,876				4					
Reading	107,784		3		13		1			
Scranton	137,783		3		70				5	
Shamokin	21,204		1		5					
Sharon	21,747				14					
Shenandoah	24,726		2		2					
Steelton	13,428				1		1		2	
Sunbury	15,721		2		5					
Swissvale	10,908				8		1		1	
Tamaqua	12,363				6					
Uniontown	15,692		1		12		3			
Warren	14,272				24					
Wilkes-Barre	73,833				4		1			
Wilkinsburg	24,403				16					
Williamsport	36,198		3							
Woodlawn	12,495				2					
York	47,512				139		2			

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Rhode Island:										
Cranston	29,407	7			19	1				
Cumberland (town)	10,077	3								
Newport	30,255	10	3		6	1				2
Pawtucket	64,248	27	2		11					
Providence	237,595	70	14	2	85	1	13			8
South Carolina:										
Charleston	67,957	22								
Columbia	37,524	20							3	2
Greenville	23,127	3	1		2		1			
South Dakota:										
Sioux Falls	25,202	3	4				3			
Tennessee:										
Knoxville	77,818		1		23					
Memphis	162,351	63	3		56	1	4		15	6
Nashville	118,342	58			315	5	2		2	4
Texas:										
Austin	34,876	8	1		40		1		3	
Beaumont	40,422	13	1		1					3
Corpus Christi	10,522	2	1							
Dallas	158,976	42	1		5		2		2	2
Fort Worth	106,482	19	2		3		2		4	3
Galveston	44,255	12					1			1
Houston	138,276	38	6				2			2
San Antonio	161,379	52	2		8					5
Waco	38,500	14			7		1			1
Utah:										
Salt Lake City	118,110	35	3		6		2			3
Vermont:										
Barre	10,008				3					
Burlington	22,779	18	1		15		1			1
Rutland	14,954	6								
Virginia:										
Alexandria	18,060	2			10					
Charlottesville	10,688	0								
Danville	21,539	4			22		2			1
Lynchburg	30,070	16			72	3			1	1
Norfolk	115,777		1		137		1		5	2
Petersburg	31,012	14	1		59		1		2	1
Portsmouth	54,387	13	1		10					2
Richmond	171,667	57			319		2		5	4
Roanoke	50,842	9			167	1	2			
Washington:										
Aberdeen	15,337								2	
Bellingham	25,585								3	
Everett	27,644								1	
Seattle	315,312		1		10		7		27	
Spokane	104,437		2				3		3	
Tacoma	96,965		2				5		2	
Vancouver	12,637								1	
Yakima	18,539								1	
West Virginia:										
Bluefield	15,282	1			56		3			
Charleston	39,608	11			6				1	1
Clarksburg	27,869	5			27		1			1
Fairmont	17,851		1		10		6			
Huntington	50,177	17			50	1	1			6
Martinsburg	12,515				16		2			
Morgantown	12,127		1		11					
Moundsville	10,669	4								
Parkersburg	20,050	10			2				1	
Wheeling	56,208	20			47		1		9	2
Wisconsin:										
Appleton	19,561	10	2		1		2			
Ashland	11,334	4					1			
Beloit	21,284	10	3		93	1	4		1	1
Fond du Lac	23,427	5					1			1
Green Bay	31,017		1		8		8			
Janesville	18,293	4	1		20		2			
Kenosha	40,472	12	3				1		6	1
Madison	38,378	9	2		113				1	
Manitowoc	17,563				12		1		1	
Marinette	13,610				1		1			

CITY REPORTS FOR WEEK ENDED APRIL 21, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Wisconsin—Continued.										
Milwaukee	457,147	114	17	2	47	.....	286	5	6	8
Oshkosh	33,162	10	.....	.....	.....	.....	1	.....	3	.....
Racine	58,593	17	.....	.....	19	.....	2	.....	.....	2
Sheboygan	30,955	8	3	.....	15	1	1	.....	.....	.....
Stevens Point	11,371	.....	1	.....	25	.....	.....	.....	.....	.....
Superior	39,671	9	.....	.....	24	.....	2	.....	.....	.....
Waukesha	12,558	.....	.....	.....	15	.....	4	.....	.....	.....
Wausau	18,661	.....	1	.....	99	.....	3	.....	2	.....
West Allis	13,745	.....	.....	.....	3	.....	5	.....	.....	.....
Wyoming:										
Cheyenne	13,829	3	.....	.....	.....	.....	.....	.....	.....	.....

FOREIGN AND INSULAR.

BARBADOS.

Smallpox (Reported as Alastrim).

Smallpox (reported as alastrim) was reported present at Barbados, West Indies, April 26, 1923.

COLOMBIA.

Further Relative to Epidemic Outbreak at Bucaramanga.[1]

The American vice consul at Barranquilla, Colombia, under date of March 29, 1923, reports to the Governor of the Panama Canal Zone as follows:

With further reference to my cable of March 15, regarding the reported fatal epidemic at Bucaramanga, Colombia, I now have the honor to advise you that I am in receipt of the following information from the National Director of Hygiene, Bogota, giving his opinion as to the nature of this malady:

"New data confirm my opinion that the fever at Bucaramanga is not yellow fever but ictero-epidemica de Weil and various cases of pernicious malaria that have proved fatal in from two to three days. Seventy-three cases have appeared within four months, with 15 deaths. There now remain but 10 cases, and the sanitary state of the city is better."

CUBA.

Communicable Diseases—Habana.

Communicable diseases have been notified at Habana as follows:

Disease.	April 11-20, 1923.		Remaining under treatment April 20, 1923.
	New cases.	Deaths.	
Cerebrospinal meningitis			[a] 4
Chicken pox	11		6
Diphtheria	4	1	6
Leprosy	1		[b] 12
Malaria	20		[c] 25
Measles			2
Scarlet fever	5		6
Typhoid fever	19	3	[d] 33

[a] From abroad, 3. [b] From abroad, 1. [c] From the interior, 18. [d] From the interior, 11.

[1] Public Health Reports, Mar. 23, 1923, p. 650.

CZECHOSLOVAKIA.

Communicable Diseases—January, 1923.

Communicable diseases were reported in Czechoslovakia during the month of January, 1923, as follows:

Disease.	Cases.	Deaths.	Provinces reporting greatest number of cases and deaths.
Cerebrospinal meningitis	9	3	Bohemia, 4 cases, 2 deaths.
Diphtheria	326	27	Bohemia, 190 cases, 16 deaths.
Scarlet fever	872	82	Slovakia, 292 cases, 34 deaths.
Smallpox	3	.....	Moravia, 2 cases.
Trachoma	305	.....	Slovakia, 158 cases.
Typhoid fever	347	26	Bohemia, 117 cases, 12 deaths.
Typhus fever	76	.....	Russinia, 72 cases.

Anthrax—Dysentery—Rabies—January, 1923.

During the month of January, 1923, two cases of anthrax, 36 cases of dysentery, and one fatal case of rabies were reported in Czechoslovakia.

ECUADOR.

Consulting Public Health Board Established.

According to information dated March 26, 1923, a consulting public health board has been established at Guayaquil, Ecuador, for the purpose of diagnosing contagious and infectious diseases. The board will be composed of six members designated by the director of public health. The duties of the board will be—

To report the existence of any contagious or infectious disease, the diagnosis of which may be obscure, in order to avert a possible epidemic.

To investigate any doubtful infectious or contagious disease appearing for the first time in any locality.

To assist the public health service in recommending sanitary measures and in giving public health lectures.

To resolve other questions as they arise regarding local sanitary conditions.

Hospitals, sanitary offices, clinics, laboratories, etc., shall supply all data requested by the board.

Similar boards shall be organized to serve in the capitals of the several Provinces.

GERMANY.

"Tropical" Malaria—Berlin.

Information appearing in the bulletin of the Office Internationale d'Hygiène, Paris, for March, 1923, shows the occurrence of a considerable number of cases of "tropical" malaria at Berlin, Germany, in persons who had never been out of the city. The cases were stated to

have been recognized only on admission to hospital. A circular was issued by the ministry of social hygiene of Prussia calling the attention of physicians to the presence of the disease, the extension of which had not been ascertained.

JAMAICA.

Smallpox (Reported as Alastrim)—Kingston.

During the two weeks ended April 14, 1923, 95 new cases of smallpox (reported as alastrim) were reported in the island of Jamaica. Of these, 7 cases were reported at Kingston.

Typhoid Fever—Kingston and Vicinity.

During the same period 7 cases of typhoid fever were reported at Kingston and 14 cases in the surrounding country.

JAPAN.

Cerebrospinal Meningitis—Taiwan Island.[1]

During the period March 21–31, 1923, 74 cases of cerebrospinal meningitis, with 63 deaths, were reported in the island of Taiwan (Formosa), Japan. The total number of cases reported from January 1 to March 31, 1923, was 538, with 269 deaths. (Population, civil, census of December 31, 1922, 3,835,811.)

MAURITIUS.

Plague—Year 1922—January, 1923.

Under date of March 9, 1923, the previously reported occurrence of plague in the Island of Mauritius, viz 65 cases reported October 19, 1922,[2] was amended as follows:

Year 1922.

Month.	Cases.	Deaths.
January	26	16
February	3	3
August	3	.....
September	8	6
October	14	14
November	25	20
December	19	14
Total	98	73

No occurrence was reported during the months of March, April, May, June, and July, 1922.

During the month of January, 1923, 18 cases were reported.

[1] Public Health Reports, Apr. 27, 1923, p. 919.
[2] Public Health Reports, Oct. 27, 1922, p. 2719.

PORTUGAL.

Lethargic Encephalitis—Lisbon.

During the week ended April 7, 1923, a case of lethargic encephalitis was reported at Lisbon, Portugal.

ST. LUCIA ISLAND (WEST INDIES).

Smallpox (Reported as Alastrim).

Smallpox (reported as alastrim) was reported at St. Lucia Island, West Indies, April 26, 1923.

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

The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

Reports Received During Week Ended May 11, 1923.[1]

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
India				Feb. 11-17, 1923: Cases, 697; deaths, 417.
Calcutta	Mar. 18-24	21	15	
Madras	Mar. 18-24	1		

PLAGUE.

India:				
Calcutta	Mar. 18-24	3	3	
Karachi	Mar. 25-31	15	12	
Madras Presidency	Mar. 18-24	204	145	
Rangoon	Mar. 11-17	65	62	
Mauritius				Year 1922: Cases, 98; deaths, 73. January, 1923: Cases, 18.
Portuguese West Africa:				
Angola—				
Loanda	Jan. 28-Feb. 3		2	
Straits Settlements:				
Singapore	Mar. 11-17	1	1	

SMALLPOX.

Arabia:				
Aden	Mar. 25-31	1		
Barbados (West Indies)	Apr. 26			Present. (Reported as alastrim.)
Brazil:				
Pernambuco	Mar. 4-31	11	1	
Rio de Janeiro	Mar. 18-Apr. 7	6	2	
Canada:				
Manitoba—				
Winnipeg	Apr. 8-14	25		
Chile:				
Antofagasta	Apr. 1-7	1		
China:				
Amoy	Mar. 11-17		1	
Foochow	do			Present.
Manchuria—				
Harbin	Mar. 12-18	1		
Czechoslovakia				Jan. 1-31, 1923: Cases, 3.
India				Feb. 11-17: Cases, 2,032; deaths, 508 Delayed report: Jan. 28-Feb. 3, 1923: Cases, 1,821; deaths, 508.
Calcutta	Mar. 18-24	21	8	
Karachi	Mar. 25-31	5	1	
Madras	Mar. 18-24	15	8	
Rangoon	Mar. 11-17	55	22	

[1] From medical officers of the Public Health Service, American consuls, and other sources.

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

Reports Received During Week Ended May 11, 1923—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Italy:				
Genoa	Apr. 1-10	1		From vessel.
Jamaica				Apr. 1-14, 1923: Cases, 95. (Reported as alastrim).
Kingston	Apr. 1-14	7		
Japan:				
Kobe	Mar. 28-Apr. 3	1		
Java:				
East Java—				
Soerabaya	Mar. 4-10	1		
Mexico:				
Guadalajara	Mar. 1-31	30	23	
Mexico City	Mar. 11-24	41		Including municipalities in Federal district.
Persia:				
Tabriz	Jan. 29-Feb. 13		1	
Teheran	Dec. 20-Jan. 20		56	
Portugal:				
Lisbon	Mar. 26-Apr. 7	11	5	
Oporto	Apr. 4-10	1		
St. Lucia Island	Apr. 26			Present.
Spain:				
Valencia	Apr. 7-14	6		
Switzerland:				
Basel	Apr. 1-7	1		
Berne	do	8		
Zurich	do	8		
Syria:				
Aleppo	Apr. 1-14	1		
On vessels:				
S. S. Bahia	Mar. 4-10	1		At Pernambuco, Brazil.
S. S. Freienfels	Apr. 13	1		At Genoa, Italy, from Karachi, via Port Said and Suez, Egypt.

TYPHUS FEVER.

Chile:				
Antofagasta	Apr. 1-7	1		
Czechoslovakia				Jan. 1-31, 1923: Cases, 76.
Egypt:				
Alexandria	Mar. 26-Apr. 1		1	
Germany:				
Königsberg	Mar. 24-30	1		
Hungary:				
Budapest	Mar. 25-31	5		
Mexico:				
Guadalajara	Mar. 1-31	1		
Mexico City	Mar. 11-24	24		Including municipalities in Federal district.
Palestine:				
Jaffa	Apr. 3-9	1		
Portugal:				
Lisbon	Mar. 26-Apr. 1		1	
Syria:				
Aleppo	Apr. 1-14	17	3	

Reports Received from December 30, 1922, to May 4, 1923.[1]

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
China:				
Liutaoku	Sept. 22	60	20	
Chosen (Korea):				
Yalu River Region				Sept. 22, 1922: 30 deaths reported.
India				Sept. 24-Dec. 30, 1922: Cases, 14,637; deaths, 8,833. Dec. 31, 1922-Feb. 10, 1923: Cases, 4,752; deaths, 2,990.
Bombay	Oct. 27-Dec. 23	2	1	
Do	Feb. 4-10	2	2	
Calcutta	Nov. 12-Dec. 30	102	60	
Do	Dec. 31-Mar. 17	304	206	

[1] From medical officers of the Public Health Service, American consuls, and other sources.

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

Reports Received from December 30, 1922, to May 4, 1923—Continued.

CHOLERA—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
India—Continued.				
Madras	Nov. 19–Dec. 16	4	2	
Do	Jan. 21–Mar. 17	11	5	
Rangoon	Nov. 12–Dec. 23	17	10	
Do	Dec. 31–Mar. 3	8	4	
Philippine Islands:				
Province—				
Laguna	Oct. 12–18	1		
Russia				Jan. 1–Oct. 7, 1922: Cases, 83,367.
Archangel (Government)	Oct. 1–7	7		
Moscow	Jan. 1–31	1		
Tashkent	Oct. 1–7	27		Turkestan Republic: 3 cases reported on waterways.
Ukraine				Sept. 1–30, 1922: Cases, 119.
Donetz (Government)	Sept. 1–30	29		
Tchernigov (Government).	do	36		
Siam:				
Bangkok	Oct. 29–Dec. 23	4	1	
Do	Dec. 31–Feb. 24	5	1	

PLAGUE.

Argentina:				
Rosario	Feb. 10–27	8	3	
Azores:				
Fayal Island—				
Castelo Branco	Dec. 2–31		3	Vicinity of Horta. Dec. 30, 1922: Several cases.
Do	Mar. 12–18	2		
Horta	Mar. 23	1		Actual occurrence about Mar. 6, 1923:
Pico Island—				
Lages	Nov. 27–Dec. 15		8	1 case present Dec. 15, 1922.
St. Michaels Island				Nov. 12–Dec. 30, 1922: Cases, 100; deaths, 35. At localities 3–9 miles from Ponta Delgada. Dec. 31, 1922–Feb. 24, 1923: Cases 126; deaths, 52. From 6 to 20 miles distant from port of Ponta Delgada.
Ponta Delgada	Nov. 26–Dec. 9	3		
Brazil:				
Bahia	Oct. 29–Dec. 30	5	5	
Do	Jan. 28–Feb. 3	1	1	
Pernambuco	Jan. 14–20	3	2	
Porto Alegre	Nov. 19–25	1		
British East Africa:				
Kenya Colony—				
Tanganyika Territory	Oct. 15–Dec. 16	12	7	
Do	Jan. 14–Feb. 10	11	10	
Uganda				Dec. 1–31, 1922: Cases, 141; deaths, 129. Jan. 1–31, 1923; Cases, 73; deaths, 73.
Entebbe	Nov. 24–30	211	202	
Canary Islands				Jan. 15–Mar. 17, 1923: Cases, 8; deaths, 7. Rodent plague present, Feb.–Mar., 1923.
Celebes:				
Macassar	Feb. 15			Present, bubonic; epidemic, pneumonic.
Ceylon:				
Colombo	Nov. 12–Dec. 30	46	38	Plague rodents, 16.
Do	Dec. 31–Mar. 17	71	66	Plague rodents, 18.
Chile:				
Antofagasta				Quarantine. Year, 1922. March, 1 case; May, 1 case.
China:				
Hongkong	Nov. 5–Dec. 23	14	12	
Do	Dec. 31–Mar. 3	3	2	
Manchuria—				
Harbin	Jan. 29–Feb. 4	7		
Ecuador:				
Guayaquil	Nov. 1–Dec. 31	9	3	Rats examined, 16,600; found infected, 72.
Do	Jan. 1–Mar. 15	24	9	Rats examined, 22,400: found infected, 116.
Sabanilla	Mar. 1–15	1		Country estate.

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

Reports Received from December 30, 1922, to May 4, 1923—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Egypt				Jan. 1-Dec. 28, 1922: Cases, 485; deaths, 228. Jan. 1, 1922-Jan. 4, 1923: Cases, 487: deaths, 228.
City—				
Alexandria	Nov. 19-25	2		
Do	Jan. 8-10	1	1	
Port Said	Nov. 19-27	4	2	
Do	Jan. 26.-Mar 5	2	1	
Suez	Nov. 18-Dec. 5	3	4	
Do	Mar. 2	1	1	
Province—				
Assiout	Nov. 19-Dec. 29	4	1	Septicemic: 1 case, 1 death.
Do	Jan. 26-Mar. 29	56	28	Bubonic, 36 cases; pneumonic: 8 cases, 4 deaths; septicemic, 5 cases, 1 death.
Dakahlieh	Dec. 3	1	1	Pneumonic.
Fayoum	Mar. 25-28	3	1	Bubonic.
Girgeh	Mar. 24-27	6	4	Bubonic, 4; septicemic, 2.
Kena	Mar. 8	1	1	Pneumonic, 1 death.
Minieh	Nov. 18-27	2	1	
Do	Feb. 24		1	
Hawaii:				
Honokaa				Feb. 8-9, 1923: Plague rats, 3.
Do				Mar. 24-25, 1923. Plague rats, 2. In vicinity Pacific Sugar Co., near Honokaa.
India				Oct. 1-Dec. 30, 1922: Cases, 25,007; deaths, 18,803. (Report for Nov. 19-25, 1922, not received.) Dec. 31, 1922-Mar. 3, 1923: Cases, 43,298; deaths, 41,775.
Bombay	Oct. 27-Dec. 30	41	32	
Do	Dec. 31-Mar. 3	146	119	
Calcutta	Feb. 11-Mar. 10	3	3	
Karachi	Dec. 10-16	1	1	
Do	Dec. 31-Mar. 24	54	46	
Madras Presidency	Nov. 19-Dec. 30	2,269	1,448	
Do	Dec. 31-Mar. 17	4,600	3,383	
Madras	Nov. 19-25	1	1	
Do	Jan. 21-27	1	1	
Rangoon	Nov. 12-Dec. 30	52	49	
Do	Dec. 31-Mar. 10	204	185	
Iraq (Mesopotamia):				
Bagdad	Oct. 1-Nov. 30	16		
Do	Jan. 1-Feb. 28	11		
Sumaichah	Mar. 14		30	Among Beni-Tenim tribes in vicinity. Locality about 30 miles from Bagdad.
Japan:				
Osaka				July 1-Nov. 30, 1922: Cases, 70.
Java				Oct. 1-Nov. 3, 1922: Cases, 900. deaths, 763. Jan. 1-Feb. 28; 1923: Cases, 1,308: deaths, 1,367,
East Java				Dec. 1-31, 1922: Deaths, 990.
Residences—				
Pekalongan	Dec. 1-31	56		
Samarang	do	202		
Soerabaya	Oct. 22-Dec. 31	34	14	
Do	Jan. 14-20	2	2	Jan. 17-23, 1923: Cases, 5; deaths, 3.
Toelong-Agoeng	Oct. 29-Dec. 16	18	18	Not a seaport.
Soerakarta—				
Klaten	Nov. 4			Present in epidemic form.
Madagascar				Jan. 1-Dec. 10, 1923: Cases, 143. Jan. 1-Feb. 28, 1923: Cases, 115; deaths, 77.
Province—				
Antisirabe	Jan. 16-Feb. 15	2	2	Bubonic and septicemic.
Diego Suarez	Jan. 1-Feb. 15	4	2	Bubonic.
Moramanga				To Nov. 12, 1922: Cases, 24; deaths, 21. Cases reported to Oct. 30, pneumonic.
Amparafara region	Sept. 18-Nov. 5	21		Bubonic, 18; septicemic, 3 (doubtful, 2).
Moramanga	Dec. 6-9	3		Bubonic.
Tamatave	Feb. 10-Sept. 12	10		Do.
Miarinarivo				Dec. 14, 1922-Jan. 1, 1923: 1 case (European).

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

Reports Received from December 30, 1922, to May 4, 1923—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Madagascar—Continued.				
Province—Continued.				
Tananarive				Jan. 1-Dec. 10, 1922: Cases, 73 (bubonic, 37; pneumonic, 8; septicemic, 28). Jan. 1-Feb. 28, 1923: Cases, 88; deaths, 66.
Ambohimangakeley	Nov. 19-Dec. 9	9		Bubonic, 3; pneumonic, 3; septicemic, 3.
Anketrina	Mar. 27-May 9	11		Bubonic, 4; pneumonic, 2; septicemic, 5 (3 doubtful).
Fenoarivo region	Oct. 7-Nov. 28	16		Bubonic, 3; pneumonic, 8; septicemic, 5.
Tananarive	Oct. 23-Dec. 10		5	1 septicemic.
Do	Dec. 14-Feb. 28	23	7	Bubonic and septicemic.
Mexico:				
Tampico	Mar. 23	2	1	Plague rodent found, Mar. 14, 1923.
Palestine:				
Jaffa	Nov. 27-Dec. 4	1		
Peru				Nov. 1-Dec. 31, 1922: Cases, 199 deaths, 93.
Do				Jan. 1-31, 1923: Cases, 151; deaths, 59.
Do				Feb. 1-15, 1923: Cases, 52; deaths, 21. (All localities of occurrence not given.) Feb. 16-28, 1923; Cases, 38; deaths, 36.
Localities—				
Barranco	Feb. 1-15	1		
Canete	Nov. 16-Dec. 31	56	19	Including vicinity.
Do	Jan. 1-Feb. 28	26	12	Do.
Casma	Jan. 1-31	1		At Campina.
Cataeaos	do	4	1	
Chepen	Dec. 16-31	2	1	Present, Nov. 9-15, 1922.
Do	Jan. 1-31	1		
Chiclayo (city and country).	Nov. 16-Dec. 15	17	7	
Do	Jan. 1-Feb. 28	25	13	
Cutervo	Feb. 16-28		8	
Eten	Nov. 16-Dec. 15	4		
Guadeloupe	Nov. 1-Dec. 31	22	12	
Do	Jan. 1-31	4	1	
Huacho	Nov. 16-Dec. 31	4	2	
Do	Jan. 1-Feb. 28	13	1	
Huara	Jan. 1-Feb. 15	8		Country.
Huaral	Nov. 16-30	1		
Do	Jan. 1-Feb. 28	4	2	
Huarmey	Dec. 1-31	2	2	
Do	Feb. 1-15	9		
Jayanca	Nov. 16-Dec. 31	10	8	
Lambayeque	do	7	3	
Do	Jan. 1-Feb. 15	10	7	
Lima (city)	Nov. 1-Dec. 31	11	8	
Do	Jan. 1-Feb. 28	5	1	
Lima (country)	Nov. 1-Dec. 31	14	5	
Do	Jan. 1-Feb. 28	7	3	
Lurin	Dec. 1-15	1		
Magdalena del Mar	Nov. 16-30	1		
Do	Jan. 1-31	1	1	
Magdalena Vieja	Dec. 16-31	1	1	
Mala	Dec. 1-31	2		
Do	Jan. 1-31	4		
Miraflores	Jan. 1-Feb. 15	5	2	
Mochumi	Dec. 16-31	3	3	
Do	Feb. 1-28	4	1	
Monsefu	Feb. 1-15	5	3	
Mosche	Nov. 16-30	2	1	
Paita	Dec. 16-31	3	2	
Do	Jan. 1-Feb. 28	14	10	
Piura	Nov. 16-Dec. 31	12	7	
Do	Jan. 1-Feb. 28	18	8	
Pueblo Nuevo	Dec. 1-31	7	4	
Do	Jan. 1-31	10	6	
San Pedro	Nov. 1-Dec. 31	8	4	
Do	Jan. 1-Feb. 28	7	4	
Santa Cruz (Hualgayoc)	Feb. 16-28	9	9	

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

Reports Received from December 30, 1922, to May 4, 1923—Continued.

PLAGUE—Continued

Place.	Date.	Cases.	Deaths.	Remarks.
Peru—Continued.				
Localities—Continued.				
Sullana	Nov. 16-30	3	3	
Do	Jan. 1-31	1	1	
Trujillo	Nov. 1-Dec. 31	3	1	
Do	Jan. 1-Feb. 28	41	15	District.
Tuman	Nov. 16-30	3	.....	
Portugal:				
Lisbon	Nov. 10-29	4	2	
Oporto	Jan. 21-27	.....	1	
Portuguese West Africa:				
Angola—				
Loanda	Oct. 1-Dec. 30	.....	45	Fatal cases among white population.
Do	Dec. 31-Jan. 20	2	.....	
Russia:				
Kirghiz Republic	.....	.....	.....	Dec. 2, 1922-Feb. 16, 1923: Cases, 116 (pneumonic), occurring in 2 out of 6 governments.
Siam:				
Bangkok	Nov. 12-Dec. 23	5	5	
Do	Dec. 31-Mar. 10	76	62	
Spain:				
Barcelona	Nov. 15-Dec. 18	1	.....	Sept. 24-Nov. 14, 1922: Cases, 23; deaths, 9.
Malaga	Jan. 27	3	.....	17 suspected cases.
Straits Settlements:				
Singapore	Dec. 17-23	2	2	
Do	Jan. 21-Mar. 10	6	6	
Syria:				
Beirut	Nov. 6-30	4	3	
Turkey:				
Constantinople	Nov. 22-28	2	.....	
Do	Jan. 28-Feb. 10	2	.....	
Union of South Africa:				
Transvaal—				
Klipfontein Farm	Dec. 16	2	1	Natives. Jan. 25, 1923: Plague infected wild rodent found in vicinity.
West Africa:				
Senegal—				
Dakar	Feb. 1-28	2	2	
On vessels:				
S. S. Helcion	Dec. 1	1	.....	At Thursday Island Quarantine, Australia, from Singapore, Straits Settlements. In Chinese firemen.
S. S. ——	Dec. 30	.....	.....	At port of London: Plague-infected rats and cats found in grain cargo on vessel from South America.

SMALLPOX.

Algeria:				
Algiers	Dec. 1-10	1	.....	
Do	Jan. 1-Mar. 31	4	.....	
Arabia:				
Aden	Nov. 19-Dec. 23	7	3	
Do	Jan. 7-Mar. 24	22	2	
Bolivia:				
La Paz	Jan. 1-Feb. 28	11	11	
Brazil:				
Bahia	Nov. 5-11	1	.....	
Do	Mar. 4-10	1	.....	
Para	Feb. 12-Mar. 25	14	.....	
Pernambuco	Jan. 21-27	1	1	
Rio de Janeiro	Nov. 25-Dec. 30	40	15	
Do	Dec. 31-Mar. 17	48	23	
Sao Paulo	Oct. 16-22	1	1	
Do	Jan. 8-Feb. 18	5	1	
British East Africa:				
Kenya Colony—				
Tanganyika Territory	Oct. 8-Dec. 23	193	10	
Do	Jan. 7-Feb. 24	44	2	
Uganda	Sept. 1-Dec. 31	3	1	Jan. 1-31, 1923: Cases, 3; deaths, 1.
Entebbe	Nov. 24-30	3	3	

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

Reports Received from December 30, 1922, to May 4, 1923—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Canada:				
Alberta—				
Calgary	Mar. 4–10	1		
British Columbia—				
Fernie	Mar. 18–24	1		
Manitoba—				
Winnipeg	Dec. 10–30	14		
Do	Jan. 21–Apr. 7	39		
New Brunswick—				
Northumberland County.	Jan. 21–Feb. 17	8		
Restigouche County	Mar. 11–17	1	1	
Ontario				Dec. 1–31, 1922: Cases, 51; deaths, 1. Jan. 1–Mar. 31, 1923: Cases, 92.
Hamilton	Dec. 31–Feb. 24	7		
Niagara Falls	Dec. 3–30	10		
Do	Dec. 31–Jan. 12	12		
Ottawa	Dec. 10–23	6		
Do	Jan. 7–Mar. 31	21	1	
Toronto	Dec. 10–30	2		
Do	Feb. 4–10	1		
Quebec—				
Quebec	Jan. 14–20	3		
Sherbrooke	Mar. 1–31		2	
Saskatchewan—				
Regina	Dec. 3–23	2		
Ceylon:				
Colombo	Nov. 12–Dec. 24	9	4	1 case, 1 death outside city.
Do	Feb. 18–Mar. 10	3		
Chile:				
Concepcion	Oct. 30–Dec. 25		7	
Do	Feb. 1–Mar. 12	3	1	
Valparaiso	Oct. 2–Dec. 26	4	54	In hospital, 83 cases.
Do	Jan. 9–Feb. 10		90	Dec. 31, 1922–Jan. 27, 1923: Deaths, 66. Feb. 16, 1923: 80 cases present (estimated).
China:				
Amoy	Nov. 5–Dec. 23		3	Nov. 26–Dec. 30, 1922: Present.
Do	Jan. 7–Mar. 24		8	
Antung	Nov. 13–Dec. 10	2		
Do	Feb. 26–Mar. 4	1		
Canton	Oct. 1–Nov. 30			Prevalent.
Do	Jan. 21–Feb. 17			Present.
Changsha	Feb. 11–17	1		
Chungking	Nov. 5–Dec. 30			Do.
Do	Dec. 31–Mar. 10			Do.
Foochow	Nov. 12–Dec. 30			Do
Do	Dec. 31–Mar. 10			Do.
Hankow	Dec. 31–Jan. 20	4	1	
Hongkong	Nov. 5–11		1	
Do	Dec. 31–Mar. 17	29	19	
Manchuria—				
Harbin	Nov. 20–Dec. 31	13		
Do	Jan. 8–Feb. 11	7		
Mukden	Nov. 19–Dec. 16			Do.
Do	Jan. 7–Feb. 3			Do.
Nanking	Nov. 5–Dec. 23			Do.
Do	Jan. 7–Mar. 3			Do.
Shanghai	Jan. 15–Mar. 25	3	2	Cases, foreign. Deaths, Chinese.
Tientsin	Feb. 18–24	1		Reported from foreign office.
Chosen (Korea):				
Chemulpo	Oct. 1–Dec. 31	135	92	
Do	Jan. 1–Feb. 28	36	17	
Fusan	Nov. 1–Dec. 31	4		
Do	Jan. 1–Feb. 28	9	1	
Gensan	Dec. 1–31	6	2	
Seoul	Oct. 1–Dec. 31	19	1	
Do	Jan. 1–Feb. 28	65	25	
Colombia:				
Buenaventura	Jan. 25–Feb. 20	48		Estimated, 50 cases present; type mild; among colored population. Feb. 16–26, 1923: 6 to 9 cases 2 miles from town limits.
Santa Marta	Apr. 18			Mild outbreak.

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

Reports received from December 30, 1922, to May 4, 1923—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks
Cuba:				
Province—				
Camaguey	Nov. 11-Dec. 31	20		
Matanzas	Jan. 1-31	2		
Oriente	Nov. 21-Dec. 31	22		
Do	Jan. 1-Feb. 10	10		
Santa Clara	Dec. 21-31	1		
Czechoslovakia				Oct. 1-31, 1922: Cases, 3.
Province—				
Bohemia	Oct. 1-31	1		
Moravia	do	1		
Slovakia	Oct. 1-Nov. 30	2		
Dominica (West Indies)				Feb. 26, 1923: Present with several thousand cases (estimated). Reported as alastrim.
Dominican Republic:				
Puerto Plata	Dec. 14-30	2		
Santo Domingo	Dec. 3-16			Present.
Do	Feb. 28-Mar. 6	3		
San Pedro de Macoris	Jan. 13-19	2		
Ecuador:				
Guayaquil	Dec. 1-31	10		
Do	Jan. 1-Feb. 28	11		
Egypt:				
Alexandria	Feb. 19-25	1		
Port Said	Jan. 21-27	1		
Esthonia				Oct. 1-Dec. 31, 1922: Cases, 61.
Do				Jan. 1-Feb. 28, 1923: Cases, 25.
France:				
Paris	Dec. 1-10	1		
Do	Mar. 4-10	1		
Germany:				
Bremen	Dec. 3-9	1		
Great Britain:				
Liverpool	Dec. 11-17	1		From vessel.
London	Nov. 26-Dec. 23	3		
Nottingham	Nov. 19-Dec. 13	4		
Do	Jan. 7-Mar. 10	16		
Greece:				
Kalamata	Jan. 13-Feb. 13		1	
Patras	Jan. 21-Feb. 17		84	
Saloniki	Nov. 6-Dec. 31	6	5	
Do	Jan. 15-Feb. 18	9	1	
Zante				Epidemic, Jan. 17, 1923.
Do	Jan. 7-14	13	4	
Guadaloupe (West Indies)				Feb. 26, 1923: Present. Reported as alastrim.
Guatemala:				
Guatemala City	Feb. 23			Present.
Honduras				Apr. 17, 1923: Outbreak in interior.
India				Nov. 5-Dec. 30, 1922: Cases, 5,783; deaths, 333. Dec. 31, 1922-Jan. 27, 1923: Cases, 7,779; deaths, 1,909.
Bombay	Nov. 5-Dec. 30	22	10	
Do	Dec. 31-Mar. 3	126	66	
Calcutta	Nov. 12-Dec. 30	46	23	
Do	Dec. 31-Mar 17	157	86	
Karachi	Nov. 26-Dec. 30	6		
Do	Dec. 31-Mar. 24	41	19	
Madras	Nov. 12-Dec. 30	71	23	
Do	Dec. 31-Mar. 17	251	71	
Rangoon	Nov. 5-Dec. 30	27	6	
Do	Jan. 7-Mar. 10	150	57	
Iraq (Mesopotamia):				
Bagdad	Oct. 1-Nov. 30	568	361	
Do	Jan. 1-Feb. 28	32	50	
Italy:				
Turin	Jan. 29-Mar. 18	21		
Jamaica				Dec. 31, 1922-Mar. 31, 1923: Cases, 557. Previously reported as alastrim.
Kingston	Mar. 11-17	1		
Japan:				
Kobe	Jan. 13-Feb. 16	6	2	
Taiwan Island	Mar. 4-10	1	1	
Yokohama	Jan. 22-Mar. 25	2		

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

Reports Received from December 30, 1922, to May 4, 1923—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Java:				
East Java—				
Soerabaya	Nov. 5–11	4		
Do	Feb. 4–Mar. 3	4	1	
West Java—				
Batavia	Nov. 11–Dec. 22	25	1	City and Province.
Do	Jan. 27–Mar. 16	17	2	Province.
Latvia				Oct. 1–Dec. 31, 1922; Cases, 7.
Martinique				Mar. 31, 1923: Present. Reported as alastrim.
Mexico:				
Chihuahua	Dec. 4–17		4	
Do	Jan. 1–Apr. 15	61	22	
Guadalajara	Dec. 1–31	4		
Do	Jan. 1–Feb. 28	54		
Mexico City	Nov. 12–Dec. 23	43		Including municipalities in Federal District.
Do	Dec. 31–Mar. 10	180		Do.
Nogales	Dec. 10–19		1	
Do	Dec. 31–Feb. 10		2	
Saltillo	Jan. 28–Feb. 3		1	
San Luis Potosi	Jan. 14–20		1	
Sonora, State				Nov. 1–30, 1922: Present in northern section.
Empalme	Nov. 1–30	4	1	
Tobasco, State				Present in some localities, Mar. 26, 1923.
Torreon	Dec. 1–31		1	
Vera Cruz	Feb. 26–Apr. 8	12	5	
Palestine				Jan. 23–Feb. 19, 1923: Cases, 8; northern district.
Persia:				
Tabriz	Dec. 18–31		2	
Do	Jan. 15–28		2	
Teheran	Oct. 24–Dec. 22		139	
Peru				Feb. 1–28, 1923; Cases, 8; deaths, 1.
Callao	Nov. 1–15	2		
Lima (city)	Dec. 1–15	3	1	
Lima (country)	Nov. 1–15	2	1	
Do	Feb. 16–28	2		City and country.
Poland				Oct. 1–Dec. 23, 1922: Cases, 132; deaths, 26. Jan. 1–27, 1923: Cases, 70; deaths, 7.
Portugal:				
Lisbon	Nov. 19–Dec. 30	143	34	
Do	Dec. 31–Mar. 31	170	83	Dec. 25–31, 1922: Deaths, 12. Feb. 19–Mar. 3, 1923: Cases, 17; deaths, 3.
Oporto	Oct. 15–Dec. 30	24	12	
Do	Dec. 31–Mar. 17	22	11	Jan. 5–20, 1923: Cases, 22, deaths, 6.
Portuguese West Africa:				
Angola—				
Loanda	Oct. 27–Nov. 11		10	
Rumania:				
Bucharest	Feb. 1–10	1		
Chisinau	Jan. 1–Feb. 28	26		
Galatz	Feb. 1–10	2		
Russia:				
City—				
Moscow				Jan. 1–31, 1923: Cases treated in hospital, 10.
Province—				
Ukraine				Jan.–Sept., 1922: Cases, 8,744.
Sierra Leone:				
Freetown	Feb. 16–28	1		
Spain:				
Corunna	Nov. 26–Dec. 2		1	
Huelva	Nov. 24–Dec. 31		4	
Madrid	Dec. 1–31		1	
Do	Jan. 1–31		1	
Seville	Nov. 27–Dec. 31		32	
Do	Jan. 1–Mar. 11		16	
Valencia	Nov. 26–Dec. 23	3		
Do	Dec. 31–Apr. 7	52	3	
Switzerland:				
Basel	Feb. 23–Mar. 24	4		
Berne	Nov. 19–Dec. 30	85		
Do	Dec. 31–Mar. 31	174		
Lucerne	Jan. 1–Mar. 31	22		
Zurich	Nov. 19–Dec. 30	19		
Do	Jan. 14–Mar. 31	44		

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

Reports Received from December 30, 1922, to May 4, 1923—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Syria:				
Aleppo	Nov. 19-Dec. 23	38	20	
Do	Dec. 31-Mar. 24	29	6	
Beirut	Dec. 11-20	1		
Damascus	Nov. 1-Dec. 31	97	16	
Do	Jan. 1-Feb. 20	22		
Tunis:				
Tunis	Dec. 1-22	2	1	
Do	Jan. 22-Feb. 4	1	1	
Turkey:				
Constantinople	Nov. 19-Dec. 16	122	34	
Do	Dec. 31-Mar. 24	416	324	
Union of South Africa				Oct. 1-Dec. 31, 1922: Cases—Colored, 64; deaths, 1; white, cases, 4.
Do				Jan. 1-Feb. 28, 1923: Cases, 34; colored, 30; white, 4; deaths, 3 (colored).
Cape Province				Oct. 1-Dec. 31, 1922: Cases—Colored, 48; deaths, 1; white, 4 cases.
Do				Jan. 1-Feb. 28, 1923: Cases, 22 (colored, 18; white, 4). Deaths, colored, 2.
Do	Dec. 31-Mar. 10			Outbreaks.
East London	Jan. 7-13	2		
Natal				Dec. 1-31, 1922: Cases, 6 (colored).
Do				Jan. 1-Feb. 28, 1923: Cases, 7; deaths, 1 (colored).
Do	Feb. 4-10			Outbreaks.
Orange Free State				Dec. 1-31, 1922: Cases, 2 (colored).
Do				Jan. 1-31, 1923: Cases, 3 (colored).
Do	Jan. 14-Feb. 3			Outbreaks.
Southern Rhodesia	Nov. 9-15	3		
Transvaal				Oct. 1-Dec. 31, 1922: Cases, 10.
Do				Jan. 1-Feb. 28, 1923: Cases, 2 (colored).
Do	Dec. 31-Mar. 3			Outbreaks.
Johannesburg	Nov. 1-30		1	
Do	Jan. 1-31	1		
Uruguay:				
Montevideo	Jan. 1-31	8		
Yugoslavia				Aug. 1-31, 1922: Cases, 30; deaths, 12.
Serbia				Aug. 1-31, 1922: Cases, 26.
Belgrade	Nov. 12-Dec. 31	10	4	
On vessel:				
S. S. Huntress	Nov. 11	1		At Fremantle, Australia; from Cape Town, South Africa.
S. S. Junin	Jan. 13	1		At Antofagasta, Chile. Vessel proceeded to Arica, Chile, with patient on board.
S. S. ———	Dec. 17-23	1		At Liverpool.
S. S. Tenyo Maru	Mar. 20	1		At Shanghai, China, from Japan. In steerage passenger.

TYPHUS FEVER.

Algeria:				
Algiers	Nov. 11-Dec. 31	2	1	
Do	Jan. 1-Mar. 31	41	10	
Oran	Jan. 11-20	1	1	
Austria:				
Vienna	Jan. 7-17	1		
Bolivia:				
La Paz	Jan. 1-Feb. 28	26	21	
Brazil:				
Pernambuco	Dec. 3-9	2	2	
Porto Alegre	Nov. 19-Dec. 16	3		
Do	Feb. 25-Mar. 3		3	
Bulgaria:				
Sofia	Feb. 4-24	2		Paratyphus, 3 cases.

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

Reports Received from December 30, 1922, to May 4, 1923—Continued.

TYPHUS FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Chile:				
Antofagasta	Nov. 12–Dec. 30	24	5	Nov. 11–Dec. 5, 1922: Cases, 10; deaths, 2. Quarantine station; October, 1922—1 fatal case on vessel from Valparaiso. November, 1922—cases, 7; December, 1922—cases, 9; remaining, Dec. 31, 3 cases.
Do	Dec. 31–Feb. 24	3	2	
Concepcion	Oct. 17–Dec. 18		9	
Do	Dec. 26–Feb. 28		10	
Iquique	Jan. 14–20		1	
Talcahuano	Nov. 12–Dec. 23	10	6	
Do	Jan. 7–Mar. 17	7	2	
Valparaiso	Dec. 3–30		9	
Do	Dec. 31–Feb. 10		23	Daily hospital average, 25 cases.
China:				
Antung	Nov. 13–Dec. 10	7		
Manchuria—				
Harbin	Nov. 20–26	7		
Do	Jan. 1–Feb. 18	7		
Cuba:				
Matanzas	Dec. 25–31	1	1	
Czechoslovakia:				
City—				
Prague	Nov. 19–25	1		
Province—				
Bohemia	Nov. 1–30	1		
Ruthenia	Oct. 1–Dec. 31	25		
Slovakia	Nov. 1–30	2		
Danzig (Free City)	Jan. 7–Feb. 24	2		Including one from Poland.
Egypt:				
Alexandria	Nov. 19–Dec. 31	2	1	
Do	Jan. 22–Mar. 25	5	2	Imported, 1.
Cairo	Oct. 1–Dec. 31	19	9	
Do	Jan. 1–28	7	4	
Port Said	Mar. 25–31	1		
Esthonia				Oct. 1–Dec. 31, 1922: Cases, 6. Recurrent typhus: Cases, 10. Year 1922: Cases, 159; recurrent typhus, 91 cases.
Do				Jan. 1–Feb. 28, 1923: Cases, 9. Recurrent typhus Jan. 1–31, cases, 4.
Libau	Dec. 24–30	1		
Narva				Year, 1922: Cases, 140; recurrent typhus: Cases, 83.
Finland				Feb. 16–Mar. 15, 1923: Cases, 7; recurrent typhus, 1.
Germany:				
Berlin	Nov. 26–Dec. 2		1	
Coblenz	Dec. 10–16	1		
Dresden	....do	1		
Do	Mar. 25–31	1		
Great Britain:				
Glasgow	Jan. 7–Feb. 17	4	1	
Greece:				
Corfu Island	Feb. 8			Present.
Leucadia	Jan. 17			Do.
Patras	Nov. 19–25		1	
Do	Jan. 1–17	3	5	
Piræus	Feb. 8			Do.
Prevesa	Jan. 17			Do.
Saloniki	Dec. 18–24	3		Among refugees.
Do	Jan. 7–Feb. 25	79	4	Refugees.
Zante	Jan. 17			Present.
Guatemala:				
Guatemala City	Jan. 1–31		1	
Hungary:				
Budapest	Jan. 14–Mar. 18	18	4	
Iraq (Mesopotamia):				
Bagdad	Feb. 1–28	1		
Ireland:				
Belmullet	June 15–Dec. 14	20		In county Mayo.
Italy:				
Trieste	Feb. 26–Mar. 3	1		
Latvia				Oct. 1–Dec. 31, 1922: Cases, 74. Recurrent typhus: Cases, 8.
Mexico:				
Mexico City	Nov. 12–Dec. 30	90		Including municipalities in Federal District.
Do	Dec. 31–Mar. 10	120		Do.
San Luis Potosi	Jan. 28–Apr. 7		4	

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

Reports Received from December 30, 1922, to May 4, 1923—Continued.

TYPHUS FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Palestine				Dec. 5-25, 1922: Cases, 3; in northern section. Feb. 27-Mar. 5, 1923—1 case in northern section.
Jaffa	Dec. 12-18	2		
Do	Jan. 16-Apr. 2	5		
Jerusalem	Dec. 26-Jan. 1	1		
Paraguay:				
Asuncion	Jan. 1-27		1	
Persia:				
Tabriz	Dec. 18-31		3	
Do	Jan. 15-28		1	
Teheran	Sept. 24-Nov. 24		3	
Poland				Oct. 1-Dec. 23, 1922: Cases, 1,916; deaths, 130. Recurrent typhus: Cases, 2,071; deaths, 56. Jan. 1-27, 1923: Cases, 1,411; deaths, 127. Recurrent typhus: Cases, 501; deaths, 10.
Portugal:				
Oporto	Oct. 15-Dec. 2	1	1	
Do	Mar. 11-17	3		
Rumania:				
Bucharest				To Jan. 31, 1923: Cases, 96; deaths, 13.
Do	Feb. 1-10	133		
Chisinau	Nov. 1-30	5		
Do	Jan. 1-Feb. 28	110		Recurrent typhus: Cases, 33.
Craiova	Feb. 1-10	1		
Russia				July 30-Sept. 23, 1922: Cases, 23,803.
Moscow	Jan. 1-31	290		Undetermined cases, 38.
Ukraine	Jan.-Sept	307,329		Provisional figures.
Ukraine, Tartar Republic, and Siberia.	June 1-30	35,926		
Do	July 1-31	17,262		Do.
Do	Aug. 1-31	6,864		Do.
Do	Sept. 1-30	2,388		Do.
Siberia:				
Vladivostok	Nov. 1-Dec. 31	5		Remittent, 1 case; indefinite, 6 cases.
Do	Jan. 1-Feb. 28	130		Remittent, 1 case; indefinite, 33 cases.
Spain:				
Barcelona	Nov. 30-Dec. 27		3	
Do	Jan. 11-Mar. 28		2	
Madrid	Dec. 1-31		1	
Do	Feb. 1-28		1	
Syria:				
Aleppo	Dec. 10-16	1	1	Generally among refugees.
Do	Jan. 7-Mar. 24	84	19	
Beirut	Oct. 1-22	1		
Turkey:				
Constantinople	Nov. 27-Dec. 2	3		
Do	Dec. 31-Mar. 24	199	109	
Union of South Africa				Oct. 1-Dec. 31, 1922: Colored—cases, 3,097; deaths, 298; white—cases, 11; deaths, 2.
Do				Jan. 1-Feb. 28, 1923: Total—cases, 1,050; deaths, 93. (Colored—cases, 1,037; deaths, 92-white—cases, 13; 1 death.)
Cape Province				Oct. 1-Dec. 31, 1922: Colored—cases, 2,799; deaths, 250; white—cases, 6; deaths, 1.
Do				Jan. 1-Feb. 28, 1923: Colored—cases, 853; deaths, 72; white—7 cases; 1 death.
Do	Dec. 31-Mar. 10			Outbreaks.
Port Elizabeth	Jan. 28-Feb. 10	3		
Natal				Oct. 1-Dec. 31, 1922: Colored—cases, 143; deaths, 32; white—cases, 2.
Do				Jan. 1-Feb. 28, 1923: Colored—cases, 38; deaths, 3; white—1 case.
Do	Feb. 4-17			Outbreaks.
Orange Free State				Oct. 1-Dec. 31, 1922: Colored—cases, 91; deaths, 8; white—cases, 3; deaths, 1.

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

Reports Received from December 30, 1922, to May 4, 1923—Continued.

TYPHUS FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Union of South Africa—Contd.				
Orange Free State—Contd.				Jan. 1-Feb. 28, 1923: Colored—cases, 93; deaths, 7; white—2 cases.
Do	Jan. 7-Mar. 3			Outbreaks.
Transvaal				Oct. 1-Dec. 31, 1922: Colored—cases, 64; deaths, 8.
Do				Jan. 1-Feb. 28, 1923: Colored—cases, 53; deaths, 11; white—cases, 2.
Do	Jan. 14-Feb. 17			Outbreaks.
Johannesburg	Nov. 1-30	3	6	
Do	Jan. 1-Feb. 28	28	3	
Venezuela:				
Maracaibo	Jan. 21-27		1	
Yugoslavia:				
Bosnia-Herzegovina	Aug. 1-31	1		
Serbia				Aug. 1-31, 1922: Recurrent typhus fever: Cases, 4.

YELLOW FEVER.

Brazil:				
Bahia	Dec. 31-Mar. 10	46	11	
Mexico:				
Ciudad Victoria	Dec. 17-23	1		
Tampico	Jan. 15	1		Reported on bills of health.
West Africa:				
Gold Coast—				
Saltpond				Reported present Dec. 21, 1922.
Nigeria—				
Warrai				Do.