Public Health Reports

Vol. 54 • SEPTEMBER 22, 1939 • *No. 38*

PREVALENCE OF POLIOMYELITIS

During the week ended September 16, 501 cases of poliomyelitis were reported in the United States, as compared with 436 cases during the preceding week and a median of 310 cases for the corresponding week of the years 1934–38. The incidence during the current week was over 60 percent in excess of the 5-year median. During the week ended September 9, a decrease was recorded over the preceding week, with a rise during the current week. The 5-year median figure also follows this trend.

New York reported 116 cases (with 20 in New York City), Michigan 61 (with 27 cases in Detroit), Minnesota 60 (of which 17 cases occurred in Minneapolis), California 42 (with 16 cases in Los Angeles), Pennsylvania 41 (with 31 cases in Philadelphia), New Jersey 28, Colorado 18, Illinois 16, Ohio 13, and Iowa and Texas 12 cases each. The number of cases reported in South Carolina decreased from 12 during the preceding week to 5 during the current week.

A PROCEDURE FOR PUTTING HEALTH DEPARTMENT REPORTS TO WORK[1]

By Mayhew Derryberry, *Senior Public Health Statistician*, and J. O. Dean, *Passed Assistant Surgeon, United States Public Health Service*

A determination of the relative importance of the various health needs of a community and of the extent to which the public health program is focused on those needs is a matter of primary concern to a health officer. As an administrator he should know that his program is concentrated on the important health problems in his community and that there is a proper balance in the various services performed by the different members of his staff. If neonatal mortality is a serious problem and typhoid fever is of minor significance he should direct the major effort of his organization into activities purported to reduce neonatal deaths and give just enough attention to typhoid fever to keep it at its low level. If his staff is concentrating all of its efforts

[1] From the Division of Public Health Methods, National Institute of Health, and the Division of Domestic Quarantine.

on infant hygiene, and giving little attention to prenatal care, he may wish to reapportion its activities into a better division of service.

Decisions of this character can be made only if the health officer has available evidence on the relative significance of the health problems in his community and on the activities of his various professional workers. Specifically, he needs data on morbidity, mortality, sanitary conditions, and other health situations under his jurisdiction, as well as records of the individuals served by his staff, the type of service rendered, the intensity of the service, and perhaps some measure of its effectiveness. Although practically all local health departments keep records on the items mentioned above, and make periodic reports on them,[2] the results of studies of health department practice made by the Division of Public Health Methods indicate that the maximum use of these records and reports as guides to administrative judgment is not being made.[3]

One reason why the records are not utilized more extensively is the complexity of the data with which the health officer must deal. The situation is not as simple as the illustration cited above in which the data on only two problems must be considered and a decision made relative to the importance of each. Instead the health officer must study data on a number of problems, including the prevention of various diseases, the control of different aspects of environmental sanitation, and the need for education in general healthful living. From such study he must decide upon the relative emphasis to be given to each of these factors in the health department program. Furthermore, he must consider how much service, such as clinic consultations, prophylactic treatments, group conferences, school examinations, and home visiting, his staff may be expected to give and which combinations of these types of service are likely to yield the best results for each problem on which his program is focused. Adding to the complexity caused by the multitude of items to be considered is the difference in significance of the same sized figures when applied to varying health conditions and types of service. For example, a community with a typhoid fever mortality rate of 4.0 has a rate that is worse than that of the majority of other communities, whereas a community with a maternal mortality rate of 4.0 has a very favorable

[2] Keeping of records of the type mentioned is necessary in order to file the quarterly reports required of all local health departments receiving grants-in-aid under titles V and VI of the Social Security Act. The details are outlined in Tabulation of Health Department Services—Report of Committee on Records and Reports to State and Territorial Health Officers and the United States Public Health Service in Thirty-fourth Annual Conference, Washington, D. C., April 13–14, 1936. Pub. Health Rep., 51: 1236–1251 (September 4, 1936).

[3] Dean, J. O. and Flook, Evelyn: Do health officers supervise their staffs? In manuscript.

Bean, Helen, and Hankla, Emily: Case records as an index of the public health nurse's work. Pub. Health Rep., 52: 1077–1088 (August 6, 1937).

Derryberry, Mayhew: Do case records guide the nursing service? Pub. Health Rep., 54: 66–76 (January 20, 1939).

Derryberry, Mayhew: Nursing accomplishments as revealed by case records. Pub. Health Rep. (in press).

standing among other communities in regard to maternal mortality. Likewise, 6 home visits per case of tuberculosis constitute a much less intensive program of visiting for tuberculosis control than the same number of visits made for each case of diphtheria or measles.

Unless complete eradication be feasible, there is no absolute minimum standard of sickness and death which a county should strive to maintain, and no absolute standard of intensity of service that should be rendered for the many health problems.[4] In the absence of such standards and because of the mass of data to be considered, the health officer frequently finds it impossible to digest thoroughly the available material before making his decisions. What he needs is some technique that will furnish him with all the information bearing on a particular problem in a manner that is easily comprehended. The purpose of this paper is to describe a relativity scale for portraying health needs and services which is designed to meet this need.[5]

In developing the scale it has been assumed that comparisons with other similar and representative communities in terms of both problems and services are valuable aids in administrative procedure. It is further assumed that for many purposes the rank of a community among other similar communities for a given index (i. e., maternal mortality, per capita expenditures, or percent of children immunized) is as useful for interpretative purposes as the actual numerical value of the index. This assumption is believed to be valid for it is the one frequently used to show the significance of a given index to a lay audience. For example, a county health officer in defending his request for additional funds may say, "Ninety percent, or 9 out of every 10 organized counties in the country spend more for public health than we do," or, in deciding to increase the attention given to tuberculosis, he may observe that the tuberculosis mortality in his county is the third highest in the country. Such statements of rank among other comparable communities are frequently much more meaningful than the exact figures such as 32 cents per capita expenditures or 98 tuberculosis deaths per 100,000 population.

The technique herein proposed is essentially a procedure whereby the actual problems or accomplishments of a community as shown by any health index, i. e., mortality rates, ratios of service to population,

[4] Standards have been proposed by the Committee on Administrative Practice of the American Public Health Association and have received wide acceptance, but they have never been considered as final or absolute standards.

[5] The Appraisal Form for Local Health Work designed by the Committee on Administrative Practice of the American Public Health Association is a valuable aid to health officers in planning and evaluating their programs. The scale described herein supplements the functions of the Appraisal Form in that it provides a relatively simple, graphic method of presenting the health picture of a community, including both its problems and services designed to attack these problems, as compared with the health picture of other communities. The relativity scale has the same limitations as the Appraisal Form in that quantitative indices are not always the best method of depicting health needs and health department accomplishments. However, appropriate interpretation of the graphs can overcome this weakness to a considerable extent.

and the like, may be interpreted as the rank among other communities for that index. By this method, indices with widely different numerical values are reduced to a scale that is directly comparable from index to index, for they show the number of communities that have smaller indices than those for the one under consideration. Even such diverse indices as physicians per 100,000 population, per capita expenditures for selected public health activities, number of serodiagnostic tests per case of syphilis, specific mortality or morbidity rates, or population per individual worker, are reduced to relative ranks so that the various ratings are commensurable.

In order to be able to determine how a community ranks among other communities on the basis of any health index, it is, of course, necessary to have data on the index from all the other communities under consideration. Once data on any index are obtained they can first be arranged in order from low to high. To give a concrete example of the procedure, data on the infant mortality rates of the 74 counties participating in the 1937 Rural Health Conservation

TABLE 1.—*Percentage of communities with smaller infant mortality rates*

Infant mortality rate	Percent with smaller rates [1]	Infant mortality rate	Percent with smaller rates [1]
11	0.7	51	51.3
12	2.0	51	
14	3.4	53	54.1
22	4.7	53	
23	6.1	56	56.1
25	7.4	57	57.4
26	8.8	59	58.8
28	11.5	60	61.5
28		60	
28		60	
30	14.2	61	64.2
31	16.2	62	65.5
31		63	67.6
32	18.2	63	
33	19.6	67	69.6
35	21.6	68	70.9
35		70	73.0
36	24.3	70	
36		71	75.6
37	26.3	71	
38	27.7	72	77.7
40	29.0	75	79.0
41	31.0	76	80.4
41		78	81.7
44	34.4	79	83.8
44		79	
44		81	85.8
45	37.3	84	87.1
45		85	88.5
46	40.5	87	89.8
46		88	91.8
47	42.5	88	
49	45.2	91	93.9
49		92	95.2
49		94	96.6
50	48.6	103	97.9
50		112	99.2

[1] It is recognized that mathematical precision would require that this column be headed as "Percentage with rates equal to or less than the given rate" and that the first percentage should be 1/N. Since, however, the technique is to be used practically rather than in any strict mathematical sense, the small error introduced by the simplification of terminology seems to be justified. Furthermore, since it is desirable to have the percentage interpretable both directly and as the complement, i. e., percentage with larger indices, the first value is ½/N rather than 1/N.

Contest of the American Public Health Association are presented in table 1.[6]

With the data so arranged it is possible to determine how the infant mortality rate for any one county compares with that of all the others. For example, a county with a rate of 40 has a higher rate than 21 of the 74 counties listed. Such a statement, though readily understood, is somewhat cumbersome, since the number of counties in the total sample must always be given.

For convenience of interpretation and universal application, it is possible to convert such statements of relative standing into percentile ranks. Thus, 29 percent of the communities have infant mortality rates smaller than 40.[7] These percentile ranks represent a scale ranging from 0 to 100. Each point on this scale is read as the percentage of communities with indices smaller than a given community's index. (The scale can also be read as the percentage of communities with indices larger than a given community's index, but, for simplicity of presentation, preference is given to percentage of communities with smaller indices.) Such scales can be constructed for any type of index, no matter what it is, so long as comparable data can be obtained from a number of representative communities as a basis for determining the percentile ranks.

Since the scale values so derived are comparable, it is possible to chart the various indices for a given community on a graph using a single scale. The indices under consideration for a community may be listed in a column on the extreme left. The computed value of the indices may be entered in the column to the left of the graphic presentation. For each index a percentile rank (percentage of communities with smaller indices) may be obtained from a table similar to table 1 which gives the percentage values for infant mortality. These percentile values can then be represented as vertical lines under the appropriate value on the scale appearing at the top of the graph. (See figs. 1 and 2.)

To illustrate the operation of the technique, a number of indices for two county health departments are charted in figures 1 and 2. The data were obtained from the reports sent in by the counties entering the 1937 Rural Health Conservation Contest. Indices were computed from the data and tabulations similar to those given in table 1 were made for each index. Then the data from two of the counties reporting were charted in figures 1 and 2. For example, in figure 1 the infant mortality rate is 26. Reference to table 1 indi-

[6] The courtesy and cooperation of the Rural Health Conservation Contest Committee in permitting data on the counties to be used for this paper is gratefully acknowledged. Special thanks are due to Miss Cecile Tonnele, secretary of the committee, who directed some of the preliminary tabulations.

[7] The reason for the slight difference in percent (29) given above and 28, which would be obtained by expressing 21 as a percentage of 74, is explained in the footnote to table 1.

cates that 9 percent of the communities have smaller indices, and therefore a short vertical line has been drawn on the graph underneath the value 9 and opposite infant mortality.

Because of limitations in printing, the illustrative graphs contain only a few of the many indices that might be used. In actual practice, however, the technique places no restriction on the number of indices that may be developed and charted nor does it limit in any way the order in which the indices are grouped on the graph.

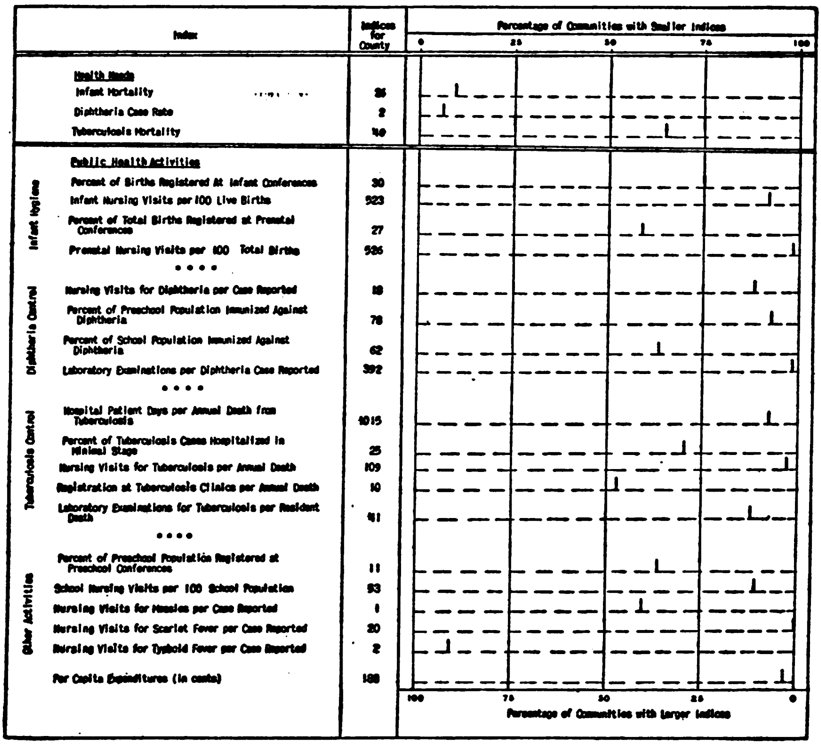

FIGURE 1.—Relativity scale showing health needs in relation to health program (program above average).

In making the selection of data to be charted, no attempt has been made to include all the indices on health needs nor to represent all phases of health department activities. Neither are the data appearing in the figures to be considered the most important indices for administrative purposes, for the importance of data is determined by the problems with which a health officer is faced. The indices do represent, however, some of the more commonly mentioned measures and as such will demonstrate the usefulness of the graphic method.

The charts present 3 indices of specific health problems or needs, 18 indices of health department activities, and 1 over-all item of expenditures for activities constituting the local health department program.

It should be stated at the outset that the indices having to do with need are usually morbidity and mortality rates. For these it is highly desirable that the indices be small. For the remaining items it is usually considered desirable to have high indices. Despite this inconsistency in interpretation there is a value in having the indices for health needs on the same scale as the indices for health services. For example, if tuberculosis mortality is low, then there may be reason to have fairly low values in the indices of service for tuberculosis control.

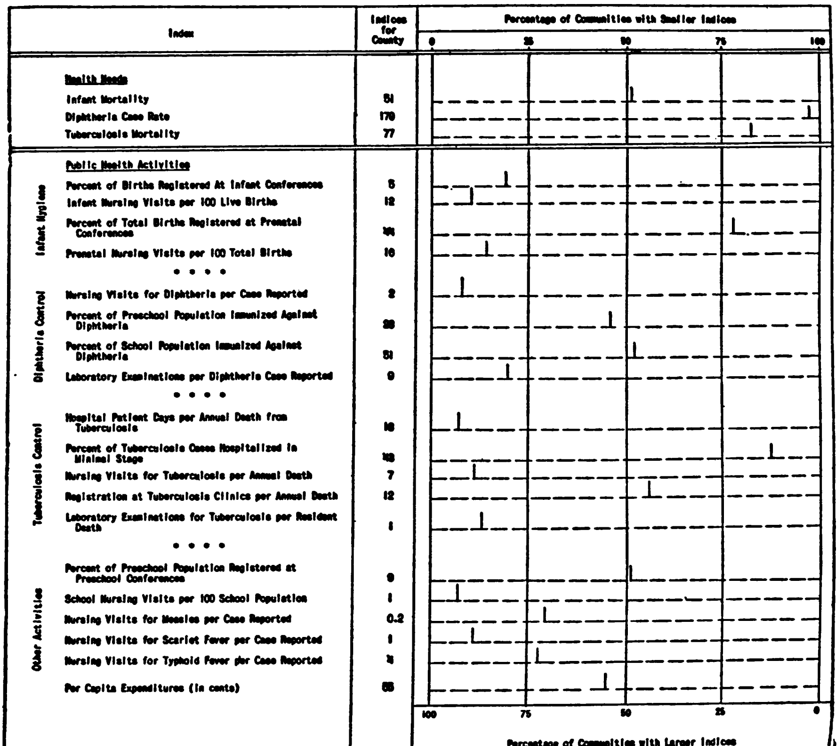

FIGURE 2.—Relativity scale showing health needs in relation to health program (program below average).

The same is true for other health problems. However, to indicate the difference in interpretation, a heavy double line has been drawn to separate the indices on health needs from the other indices.

As illustrative of the type of information to be gleaned from the graphs, a few observations that are immediately apparent in figure 1 are given below.

On the whole, the health program of the county charted in figure 1 is well above the average. The level of the department's activities is above the average in practically all the indices charted and only 3 percent of the counties have a higher per capita expenditure. In terms of health problems the county also shows a fairly favorable status. Two of the indices, infant mortality and diphtheria incidence, show that the county ranks among the 10 percent of counties having relatively low infant mortality and diphtheria incidence rates. Only in tuberculosis mortality does the county show a need that is greater than the average of other counties. A more careful examination of the indices of health activities reveals that, in comparison with other counties, this county gives little attention to nursing visits for typhoid fever. Likewise, the index of medical service for tuberculosis control (number of individuals registered at tuberculosis clinics per annual death) is the next lowest index, and the percent of tuberculosis cases hospitalized in the minimal stage is somewhat lower than the other indices of activity for tuberculosis control. These observations immediately suggest the questions: Is it possible that this lower amount of medical attention for tuberculous patients may be responsible for the unsatisfactory tuberculosis rate? Might it not be more effective to rearrange the tuberculosis control program to give more service along these lines? Perhaps less attention could be given to infant hygiene activities, since these are being conducted on a relatively high plane, and the infant mortality rate is extremely low in comparison with other counties. Such shifting would make it possible to concentrate more on the tuberculosis problem.

In figure 2 the opposite picture is seen. Although the per capita expenditures for the health-department program approximate the average for all counties reporting, yet practically all of the indices appearing on the graph are much below average. Can it be that this county is expending its resources on other activities than those charted, or is it merely getting less service for its money? Two of the three problems included under health needs (tuberculosis and diphtheria) are outstandingly serious, so far as comparison with other counties is concerned. The other, infant mortality, is exactly average. Data on the program of activities show a very unbalanced program. For example, a relatively large proportion of tuberculosis cases are hospitalized in the minimal stage, yet over 90 percent of the counties provide more total patient days of hospitalization for tuberculosis than does this county. (Unfortunately, data on case-finding procedures could not be included in the graph.) The amount of ambulatory medical attention given tuberculosis patients in terms of registration at clinics is greater in this county than in the one shown in figure 1, yet the number of nursing visits is relatively low. In the control of diphtheria, which is an outstanding problem, the county gives relatively more emphasis to immunization of the school child than of the preschool child, and very little nursing service to the cases reported. These facts in themselves suggest reconsideration of the program.

It is unnecessary to analyze further the type of information that can be obtained easily from data presented in this manner. The above would seem to be sufficient to show the possibilities of the method.

After a graph showing all the problems and activities has been prepared, the indices can be reassembled according to any particular grouping a health officer may wish to study. For example, he may group all the indices on maternal and child hygiene on one graph for a study of that program. He may assemble all the nursing activities on a single chart as a basis for discussing the nursing program with his nurses. Thus the technique is sufficiently flexible to permit its use in any meaningful combination of indices in which the health officer may be interested.

ADVANTAGES OF THE RELATIVITY SCALE

The method does not meet all needs but it does have a number of advantages for the careful planning and administration of a health program. Among these are the following:

1. The universally applicable and comparable scale makes possible comparisons between any number of indices for a community.
2. By presenting the indices on health problems of a community graphically on one chart, a health officer can determine the relative severity of the several problems in his community as compared with other communities.
3. By grouping the indices of health services on one chart, a health officer may be able to judge the degree to which he is conducting a balanced program. (Balance is here defined as the extent to which a community maintains about the same relative standing in all of its various activities.)
4. By grouping the indices of activities focused on specific problems with the index or indices of those problems, a health officer may judge whether his program is concentrating on the urgent problems or is neglecting them for some less severe condition. In the event any problem is shown to be serious and the activities focused on that problem are not as intensive as for some less serious problem, he can modify his program in terms of the revealed need.
5. The procedure permits of a graphic presentation of social, economic, and other community factors along with indices of health problems as a means of studying the relation of such factors to the health problems.
6. The standards are not fixed arbitrarily. The scale values are determined by performance and are subject to alteration as rapidly as performance changes. Each State may develop its own series of standards if it so desires. In addition, some central agency, either official or private, should prepare annually standards for the country as a whole, based on the performance of the past year. Such standards would permit comparison with other counties or communities both within the State and for the entire country. However, they would not imply adequacy of program, for they merely indicate what other departments are doing.

OTHER USES OF THE RELATIVITY SCALE

In the preceding illustrations, the advantages of the scale to the health officer in understanding the health needs of his community and in focusing his program on those needs have been shown. The health officer will also find the graph a useful device in explaining the health program to a lay audience, for it translates the data into easily understood terms. A well-prepared graph of this nature, showing a specific problem as being paramount, coupled with an inadequate program to meet that problem, owing to lack of funds, should be helpful in an attempt to secure funds to carry on proposed activities to meet the problem.

To the State or district supervisor the technique furnishes a cue to the strengths and weaknesses in a given county program. His services can be more specifically directed towards the places where his advice is most useful, and the charted data will assist him in discussing the problems with the operating personnel.

For the Rural Health Conservation Contest Committee of the American Public Health Association the scale offers an easily comprehended method of reporting back to the counties. Verbal comments on various relationships within the activities will be stimulated by the graphic display of the situation discussed.

It is believed that, as the technique becomes more thoroughly understood by health officers, and more extensively used, it will help to improve the accuracy of record keeping. Because of the way in which the scale operates, errors in record keeping tend to be revealed as imbalance of program or as improbable indices. Thus, proper supervision and use of the indices will help to improve the accuracy of the data charted on the graph.

SUMMARY

A graphical method for making health department records more useful for administrative purposes has been described. It is based on the principle of translating indices of health needs and health problems into a scale that indicates a community's relative standing among other communities in any given index, thus making possible immediate comparisons of one community with others. Although the technique should be an aid to administrators, it is not a panacea, for, like all devices, it will not replace intelligent consideration of problems before final decisions are made.

THE EXPERIMENTAL TRANSMISSION OF POLIOMYELITIS TO THE EASTERN COTTON RAT, *SIGMODON HISPIDUS HISPIDUS*

By CHARLES ARMSTRONG, *Senior Surgeon, Division of Infectious Diseases, National Institute of Health, United States Public Health Service*

Through the courtesy of Dr. Max Peet, of the Department of Surgery, University of Michigan, we received on August 28, 1937, a sample of brain and cord from an 18-year old boy, one of several bulbar cases of poliomyelitis which occurred at Lansing, Mich., during that summer. A strain of virus was recovered from the material which has now been through 15 monkey passages and which clinically, and pathologically as reported by Surgeon R. D. Lillie, is apparently a strain of poliomyelitis. Neutralization tests with this virus have not been done.

On November 8, 1937, several species of rodents, including a cotton rat received through the courtesy of Dr. A. Packchanian, of the National Institute of Health, were inoculated with a fourth monkey passage of the virus. The cotton rat remained apparently well until the twenty-fifth day, when it appeared nervous and tremulous. On the following day it was paralyzed in both hind legs and was sacrificed.

Pathologist R. D. Lillie, who has made all the pathological studies, reported "polioencephalitis." Eleven cotton rats were inoculated with this strain of poliomyelitis virus during the winter of 1938, of which rat No. 9, inoculated on February 14, became paralyzed in both hind legs 29 days later. Brain and cord emulsion was passed to rat No. 13 and symptoms appeared on the sixteenth day. On the following day there was paralysis in the right front leg. Attempts at further passage were without success.

Efforts were again made, however, during the poliomyelitis season of 1939, and up to the time of this report the Lansing strain of virus has been carried in series through 7 cotton rat transfers and animals of the eighth transfer are developing symptoms. Rat brain and cord from the second and fifth passages conveyed typical poliomyelitis symptoms when introduced into monkeys. The details of these transfers are shown in table 1. Further transfers are under way.

The inoculum utilized was a 5 percent suspension of brain and cord and the dosage has been approximately 0.06 cc. intracerebrally, 0.06 cc. intranasally, and 0.25 cc. subcutaneously, for each animal. The minimal infective dose has not been determined, since it was necessary to conserve our limited supply of cotton rats and we preferred, moreover, to wait until the virus had become somewhat adapted to the host. The virus at the sixth serial transfer seems to be gaining in virulence. A more detailed report of the results will be made later.

TABLE 1.—*Results of transfers of virus to cotton rats and monkeys*

Transfer	Number of animals inoculated		Date of inoculation (1939)	Incubation period, in days, of animals paralyzed	Number of animals not paralyzed	Pathology
	Cotton rats	Monkeys				
1	3		July 12	14	2	Polioencephalitis.
2	3		July 27	4, 8, 13	0	Do.
3	7		Aug. 8	8, 8, 9, 11, 13	[1] 2	Do.
3		1	Aug. 11	4, complete paralysis sixth day.	0	Severe poliomyelitis.
4	5		Aug. 16	5, 6, 7, 9	[1] 1	Do.
5	7		Aug. 26	6, 6, 8, 8, 12	[1] 2	Do.
6	4		Aug. 31	6, 6, 7	[2] 1	Do.
6		1	do	7, paralysis both arms	0	Do.
7	4		Sept. 7	5, 5, 6, 7	0	Do.

[1] 1 rat that failed to react had been previously inoculated with the same strain of virus without paralysis developing.
[2] This rat had been twice previously inoculated without paralysis developing.

Successful transmission to date has been secured with the Lansing strain of virus only. Limited attempts at transmission were carried out with two strains of virus from Niagara Falls and with P. M. virus during the winter of 1938, at which time we also had only failures with the strain which now is giving results.

The first symptoms noted in the cotton rats consist of a roughened appearance of the fur and a tendency to react by violent jumping when agitated. Paralysis of a flaccid type has developed in all animals which we have considered as affected. The legs may be paralyzed in all combinations and respiratory difficulty has developed in several, with the respiratory rate falling as low as 30 per minute in some. Two rats with respiratory failure died; the others were etherized.

A number of other rodents have been inoculated with the virus utilized in the course of this study, including groups of Swiss mice with successive transfers, but no positive results have been secured in animals other than the cotton rats.[1]

The eastern cotton rat is not vicious and it multiplies readily in captivity. It is hoped, therefore, that when a sufficient supply becomes available and the most susceptible age is determined the cotton rat may prove to be a cheap, convenient, and useful laboratory animal for the study of poliomyelitis.

It is conceivable, however, that the results secured may be due to some peculiarities of this particular strain of virus.

ACKNOWLEDGMENTS

The author desires to express his indebtedness to Dr. A. Packchanian, of the National Institute of Health, from whom the earlier supplies of rodents were secured, and to Passed Assistant Surgeon A. G.

[1] In 1937 two wood rats, *Neotoma albigula albigula*, were believed to have died of experimental poliomyelitis, but these results have not been confirmed.

Gilliam, Edward B. Chamberlain, Jr., M. T. Coleman, and Mammalogist E. B. Chamberlain for aid in securing and identifying rodents for the later studies.

RELAPSING FEVER: THE GUINEA PIG AS AN EXPERIMENTAL ANIMAL IN THE STUDY OF *ORNITHODOROS TURICATA*, *O. PARKERI*, AND *O. HERMSI* STRAINS OF SPIROCHETES [1]

By GORDON E. DAVIS, *Bacteriologist, United States Public Health Service*

Incident to recent studies on relapsing fever spirochetes the following observations have been made on the susceptibility of the guinea pig to tick-transmitted strains indigenous to the United States.

The following strains of spirochetes were used in these studies: *Ornithodoros turicata* Texas 1 and 2, *O. turicata* Kansas 1 and 2, *O. parkeri* Montana, *O. parkeri* Wyoming 1, 2, 3, and 4, and *O. hermsi* California. The *turicata* Texas 1 strain was received October 1935, in ticks from Prof. Hardy Kemp, of the Baylor University Medical School, Dallas, Tex.; the *turicata* Texas 2 strain was recovered from ticks collected in August 1937, in Gray County, Tex., by Assistant Entomologist Glen M. Kohls; the *turicata* Kansas strains were recovered from ticks collected in August and September 1936, in Clark County, Kans., by the writer; the *parkeri* Montana strain was from ticks collected in September 1936, in Beaverhead County, Mont., by Assistant Parasitologist Wm. L. Jellison; the *parkeri* Wyoming strains 1 to 4 were from ticks collected in 1937 and 1938, in Sweetwater County, Wyo., by the writer; and the *hermsi* strain was received March 30, 1937, in white mice from Dr. K. F. Meyer, Director of the Hooper Foundation, San Francisco, Calif. All strains have been maintained in ticks of their respective species. The *O. hermsi* ticks were received in December 1936 from Dr. Charles Wheeler, also of the Hooper Foundation.

The strains were introduced into the test guinea pigs by the bite of infected ticks and the injection of infectious rat blood. If two guinea pigs received rat blood of any strain, one was injected subcutaneously, the other intraperitoneally. If only one guinea pig was used, the route of injection is noted in the text. The amount of rat blood employed was 0.5 cc. unless otherwise stated. When ticks were used, they were allowed to feed to satiation. Blood films from each test guinea pig were examined daily, the period of observation varying in the several experiments. The shortest period was 15 days, the longest 31. All films were stained with Giemsa.

---

[1] Contribution from the Division of Infectious Diseases, National Institute of Health, Rocky Mountain Laboratory, Hamilton, Mont.

Ornithodoros turicata STRAINS

GUINEA PIGS INFECTED BY INJECTING WHITE RAT BLOOD (FIG. 1)

Kansas 1 strain.—On March 8, 1938, two guinea pigs (A19310 and A19311) were injected. The subcutaneously injected guinea pig remained afebrile, but spirochetes appeared in the peripheral blood on the second day and on each day from the seventh to the eleventh, inclusive. The guinea pig injected intraperitoneally had temperatures of 39.8° and 40.0° C. on the seventh and ninth days, respectively, and spirochetes appeared in the peripheral blood on the second and on the seventh, eighth, and ninth days. Each guinea pig had one relapse.

Kansas 2 strain.—On March 8 two guinea pigs (A19291 and A19312) were injected. Spirochetes appeared in both on the eighth and the ninth days. Neither guinea pig showed fever or any relapse.

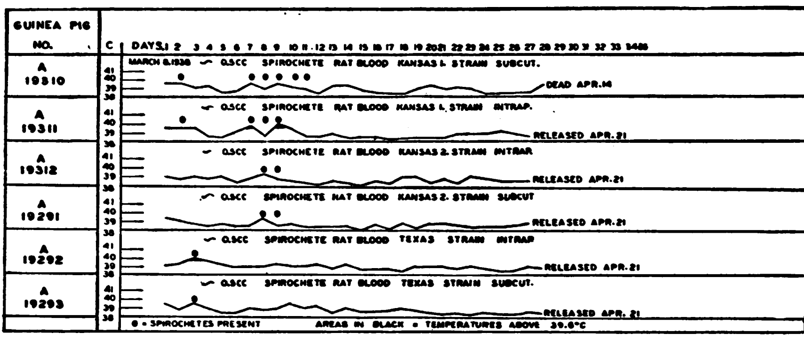

FIGURE 1.—*O. turicata* strains. Blood transfers.

Texas strain 1.—On March 8 two guinea pigs (A19293 and A19292) were injected. On the third day the temperatures were 39.6° and 40.0° C., respectively, and spirochetes were demonstrated in the blood of both animals. There were no relapses.

GUINEA PIGS INFECTED BY TICK FEEDING (FIG. 2)

Kansas 1 strain.—On April 20 nymphal *O. turicata* No. 32 engorged on guinea pig A19991. The temperature of the guinea pig was 40.0° C. on the seventh and thirteenth days. Spirochetes were demonstrated in the peripheral blood on both days. There was one relapse.

On May 28 female *turicata* No. 32 engorged on guinea pig A98265. Spirochetes appeared on the seventh and fifteenth days, with accompanying temperatures of 39.6° and 39.5° C., respectively. There was one relapse.

On May 28 nymphal *turicata* No. 18 engorged on guinea pig A19992. Temperatures of 40.4° and 40.6° C. were recorded on the ninth and fifteenth days, respectively, and spirochetes were demonstrated on both dates. There was one relapse.

On May 30 female *turicata* No. 18 engorged on guinea pig A98266. On the seventh, eighth, and fifteenth days there were elevations of temperature to 40.0°, 40.0°, and 40.4° C., respectively. Spirochetes were present with each rise in temperature. There was one relapse.

On May 28 female *turicata* No. 9 engorged on guinea pig A98264. There were temperatures of 40.6°, 39.8°, and 39.6° C. on the fifth, ninth, and tenth days, respectively. Spirochetes were not found

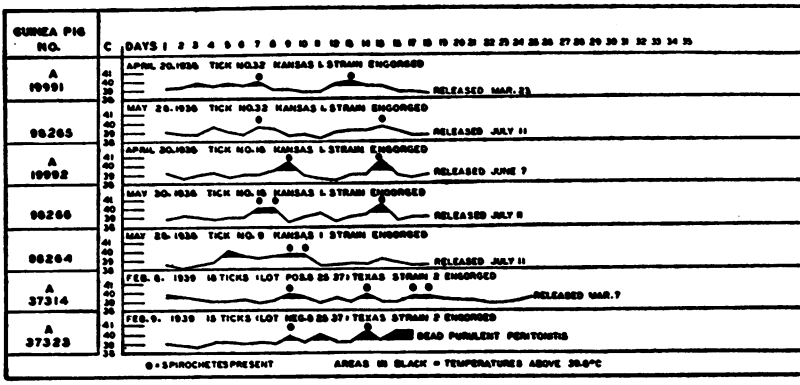

FIGURE 2.—*O. turicata* strains. Tick feedings.

during the first rise in temperature, but were present on the ninth and tenth days. One relapse occurred.

Texas strain 2.—On February 8, 1939, 18 ticks which had infected a rat on August 25, 1937, and had not since been given an opportunity to feed were placed in a feeding capsule on guinea pig A37314. The guinea pig showed definite fever on the ninth (40.0°), the fourteenth (40.0°), and the seventeenth and eighteenth days (39.8°, 39.8° C.). Spirochetes were observed at each rise in temperature. There were two relapses.

On February 9 a lot of 15 ticks which had failed to infect a white rat on August 25, 1937, and had not since been given an opportunity to feed were placed in a feeding capsule on guinea pig A37323. Spirochetes were present on the ninth and fourteenth days, with temperatures of 39.8° and 40.4° C., respectively. There was one relapse.

O. parkeri STRAINS

GUINEA PIGS RECEIVING BLOOD FROM INFECTED WHITE RATS (FIG. 3)

Montana strain.—On March 3, 1938, two guinea pigs (A19309 and A19308) were injected. In the animal injected subcutaneously spirochetes were present from the sixth to the ninth days (temperatures 40.4°, 39.6°, 39.4°, 39.8° C.) and again on the eleventh and twelfth days (39.6°, 39.8° C.). In the animal injected intraperitoneally spirochetes appeared on the seventh and eighth days (40.6°, 39.8° C.) and on the tenth and eleventh days (40.2°, 39.9° C.). One relapse occurred.

Wyoming 1 strain.—On Mareh 8 two guinea pigs (A19294 and A19295) were injected. In the subcutaneously injected guinea pig spirochetes were demonstrated on the third to fifth (40.4°, 40.4°, 40.0°C.) and ninth days (39.4°). In the second guinea pig spirochetes were demonstrated on the fourth, fifth (40.0°, 40.4° C.) and eleventh to thirteenth days (40.2°, 39.0°, 41.0° C.). Each guinea pig had one relapse.

Wyoming 2 strain.—On January 31 guinea pig A12536 received a

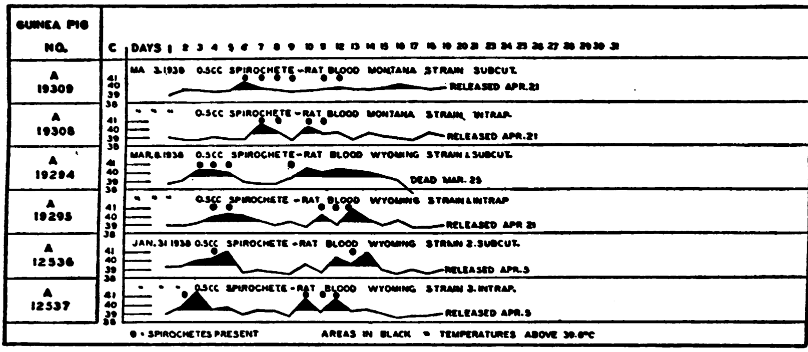

FIGURE 3.—*O. parkeri* strains. Blood transfer.

subcutaneous injection. Spirochetes were demonstrated on the fourth and thirteenth days with temperatures of 40.2° and 39.8° C., respectively. One relapse occurred.

Wyoming 3 strain.—On January 31 guinea pig A12537 received an intraperitoneal injection. Spirochetes were present on the second (39.8° C.) and from the tenth to twelfth days (40.8°, 39.2°, 40.8° C.). There was one relapse.

GUINEA PIGS INFECTED BY TICK FEEDING (FIG. 4)

Montana strain.—On July 21, 1938, female *parkeri* No. 5 engorged on guinea pig A25540. There were 2 febrile periods, viz, the sixth

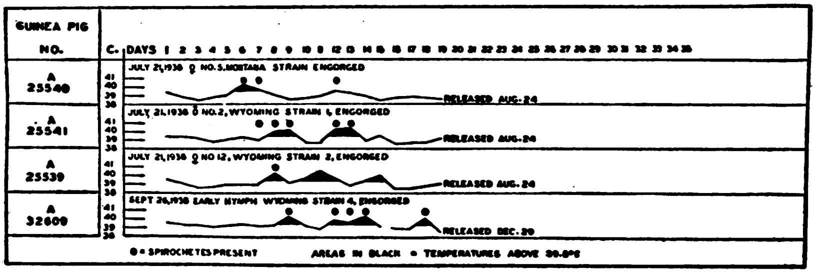

FIGURE 4.—*O. parkeri* strains. Tick feedings.

and seventh days (40.2° and 39.6°) and the thirteenth day (39.6° C.). Spirochetes were present on each of these days. One relapse occurred.

Wyoming 1 strain.—On July 21 male *parkeri* No. 2 engorged on guinea pig A25541. Temperatures were 39.8°, 40.0°, and 40.2° C. on the seventh, eighth, and ninth days, respectively, and 40.2° and 40.4° C. on the twelfth and thirteenth days. Spirochetes were present during each febrile period. There was one relapse.

Wyoming strain 2.—On July 21 female *parkeri* No. 12 engorged on guinea pig A25539. Spirochetes were found only on the eighth day when a temperature of 40.4° C. was present. However, two subsequent febrile periods suggest that spirochetes may have been present later.

Wyoming strain 4.—On September 26 a *parkeri* early nymph engorged on guinea pig A32609. Temperatures of 40.4°, 40.0°, 39.8°, 40.4°, and 40.2° C. were recorded on the ninth, twelfth, thirteenth, fourteenth, and eighteenth days, respectively. Spirochetes were demonstrated during each rise in temperature, indicating two relapses.

O. hermsi STRAINS

GUINEA PIGS RECEIVING BLOOD FROM INFECTED WHITE RATS (FIG. 5)

California strain.—On March 23, 1938, guinea pigs A19940 and A19939 were injected. In the subcutaneously injected guinea pig

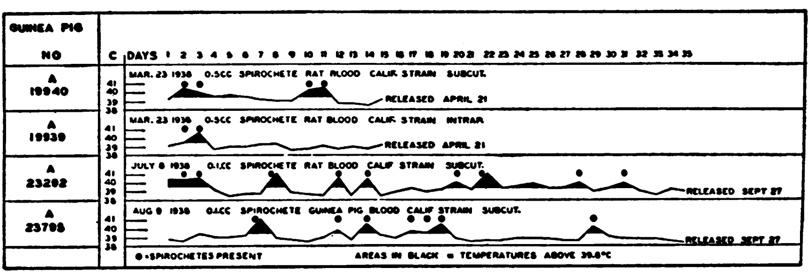

FIGURE 5.—*O. hermsi* strains. Blood transfers.

there were 2 febrile periods, viz, the second and third days (40.4° and 40.0° C.) and the tenth and eleventh days (40.2° and 40.4° C.). Spirochetes were demonstrated on all 4 days. One relapse occurred. In the second guinea pig spirochetes were found only on the second and third days (39.6°, 40.6° C.), There was no apparent relapse.

On July 8 guinea pig A23292 received 0.1 cc. rat blood subcutaneously. There were six febrile periods, viz, on the second and third (40.4°, 40.6° C.), the eighth (41.0° C.), the twelfth to fourteenth (40.6°, 40.0°, 40.0° C.), the twentieth and twenty-second (40.0°, 41.0° C.), the twenty-fourth and twenty-fifth (39.8°, 40.0° C.), and the twenty-eighth and thirty-first days (40.0°, 40.0° C.). Spirochetes were demonstrated on all but the twenty-fourth and twenty-fifth days. There were four definite relapses.

On August 9 guinea pig A23795 received 0.1 cc. of blood from the above guinea pig A23292 subcutaneously. Spirochetes were demonstrated at each rise in temperature, viz, on the seventh (41.0° C.), the twelfth and fourteenth (39.8°, 40.4° C.), the seventeenth, eighteenth, and nineteenth (39.8°, 39.6°, 40.6° C.), and the twenty-ninth days (40.2° C.). Three definite relapses occurred.

GUINEA PIGS INFECTED BY TICK FEEDING (FIG. 6)

California strain.—On May 12, June 9, and June 27, 1938, *O. hermsi* male No. 6D engorged on guinea pigs 98203, 98317, and A23208 respectively. The first guinea pig had three febrile periods, viz, the sixth and seventh (40.2°, 40.8° C.), the fifteenth and sixteenth (39.7°, 39.8° C.), and the twenty-first and twenty-second days (40.2°, 40.5° C.). Two relapses occurred. Spirochetes were present during each febrile period. Forty-three days following tick engorgement spirochetes were recovered from blood, brain, and bone marrow by rat inoculation.

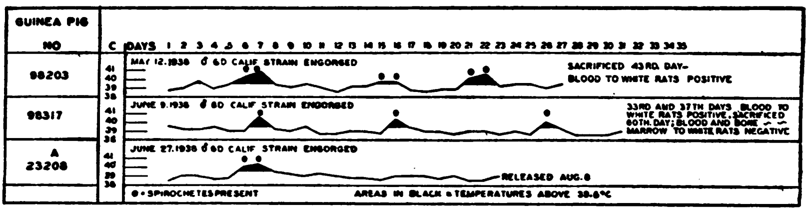

FIGURE 6.—*O. hermsi.* Tick feedings.

The second guinea pig had temperatures of 40.6°, 40.4°, and 40.0° C. on the seventh, sixteenth, and twenty-sixth days. There were two relapses and spirochetes were demonstrated during each. White rats injected with the blood and bone marrow taken from these guinea pigs 50 and 60 days, respectively, after tick feeding did not show spirochetes.

In the third guinea pig fever was present only on the sixth and seventh days (40.0°, 40.4° C.). Spirochetes were present on both days. On the eighteenth day (39.0° C.) blood from this guinea pig was injected into a white rat in which spirochetes were later demonstrated. Spirochetes were not recovered by injecting rats with blood taken on the thirty-second day or with brain tissue and bone marrow taken on the forty-second day. In several subsequent feedings on rats it was shown that this tick had lost its infectivity.

DISCUSSION

Other workers using native strains of relapsing fever spirochetes have also reported on the susceptibility of guinea pigs. Kemp, Moursund, and Wright (*1*), using a *turicata* (Texas) strain, failed to produce infections uniformly by either intraperitoneal or intravenous inoculations. Coleman (*2*) has summarized his experience with *hermsi* (California) strains as follows: "While spirochetes are usually present, in certain animals the cardiac blood examined in thick film every day for 22 to 23 days after inoculation never revealed spirochetes though it was infectious for mice." Beck (*3*), who also worked with a *hermsi* strain, found that guinea pigs are not quite as refractory to rodent blood as to human blood, and concludes that they are of no value in the laboratory diagnosis of relapsing fever.

In the studies herein reported, the sources of spirochetes were white rat blood and ticks. No blood from human patients or wild rodents was used. Ten strains, representing 3 species of ticks, were employed and all 30 test guinea pigs became infected. As judged from the demonstrated presence of spirochetes in the peripheral blood, 7 guinea pigs had no relapses, 17 had 1, 4 had 2, 1 had 3, and 1 had 4. In the case of the *turicata* strains, figures 1 and 2 indicate that more definite results were obtained with ticks than from rat blood. However, this was not true of the *parkeri* or *hermsi* strains. The data shown in figure 5 suggest that a small amount of blood injected subcutaneously may result in a more prolonged infection than larger amounts. Figure 6 gives the results of three successive feedings of the same male tick over a period of 45 days. The records suggest that the strain carried by this tick was progressively losing its invasiveness. Weight is added to the assumption by the fact that further feeding on white rats by this tick failed to cause infection.

CONCLUSIONS

Guinea pigs have been shown to be susceptible to strains of relapsing fever spirochetes transmitted by *Ornithodoros turicata*, *O. parkeri*, and *O. hermsi*. These results suggest that the guinea pig may be a useful adjunct to white rats and white mice in the study of strains of relapsing fever spirochetes native to the United States.

REFERENCES

(*1*) a. Kemp, Hardy A., Moursund, W. H., and Wright, Harry E.: Relapsing fever in Texas. II. The specificity of the vector, *Ornithodoros turicata*, for the spirochete. Am. J. Trop. Med., **14**: 159–162 (1934).

b. ——— Relapsing fever in Texas. III. Some notes on the biological characteristics of the causative organism. Am. J. Trop. Med., **14**: 163–179 (1934).

(*2*) Coleman, George E.: Relapsing fever problems of California. Am. J. Pub. Health, **24**: 1056–61 (1934).

(*3*) Beck, Dorthy: Relapsing fever. Laboratory Procedure. Calif. Department of Health, Special Bulletin No. **61**, pp. 19–23 (1936).

(*4*) Davis, Gordon E.: *Ornithodoros turicata:* The possible vector of relapsing fever in southwestern Kansas. Pub. Health Rep., **51**: 1719 (1936).

(*5*) Davis, Gordon E.: *Ornithodoros parkeri:* Distribution and host data; spontaneous infection with relapsing fever spirochetes. Pub. Health Rep., **54**: 1345–49 (1939).

THE EFFICIENCY OF THE CONDENSATION METHOD FOR SAMPLING CERTAIN VAPORS[1]

By F. H. GOLDMAN, *Associate Chemist*, and J. M. DALLAVALLE, *Passed Assistant Sanitary Engineer, United States Public Health Service*

The condensation method for the sampling of certain vapors has been widely used in industrial hygiene investigations. This method has several advantages over the usual type of absorption apparatus, chief among which may be mentioned simplicity of construction and ease in handling collected samples for analysis. However, the use of condenser-type sampling devices entails several considerations not often given proper attention. For example, extremely cold liquids for freezing out vapors may often reduce collection efficiency rather than increase it. This is due to the sudden formation of extremely fine mist which passes through the apparatus without condensing. Again, the freezing of water vapor, causing a clumping within the collecting tube, may be sufficient to obstruct the flow of air completely. The most practical relationship between length and diameter of tube and the rate of sampling are also little understood.

In this paper the characteristics of the condensation-type sampling device in its simplest and commonest form are discussed. The method described makes use of a U-tube immersed in a freezing mixture of dry ice and methyl alcohol (−78° C.). No attempt is made to relate all variables with the efficiency of collection. The primary purpose of the paper is rather to discuss the limitations of the condensation technique for field investigations in industrial hygiene.

In the experiments described below, two types of vapors, water vapor and bromine, were employed to test the condensation technique of sampling. The vapor pressures of these substances are ideally suited to determine the efficiency of sampling. Their chemical analysis can be accomplished easily and with great precision. It is obvious that substances having high vapor pressures at the freeze-out temperatures will be condensed with less effectiveness than those with low vapor pressures. The physical properties of water vapor and bromine are given in table 1.

TABLE 1.—*Properties of substances used in condensation tests*

Temperature of dry ice and methanol.	−78° C.	Vapor pressure of bromine at 20° C.	173.0 mm. Hg.
Freezing point of water	0° C.	Vapor pressure of bromine at 0° C.	65.9 mm. Hg.
Freezing point of bromine	−7.3° C.	Vapor pressure of bromine at −7.3° C.[1]	44.4 mm. Hg.
Vapor pressure of water at 20° C.	17.5 mm. Hg.		
Vapor pressure of water at 0° C.	4.6 mm. Hg.		
Vapor pressure of water at −78° C.	0.0356 mm. Hg.		

[1] Melting point. Value for vapor pressure at −78° C. not available.

[1] From the Division of Industrial Hygiene, National Institute of Health.

EXPERIMENTAL PROCEDURE

SAMPLING OF WATER VAPOR

The arrangement used for collecting water vapor is illustrated in figure 1. Atmospheric air is drawn by means of the ordinary impinger pump through a sintered glass bubbler containing water at room temperature. The moisture-laden air then passes through a glass U-tube the over-all length of which is 2½ feet. This is a convenient length to bend and appears adequate. Most of the sample is

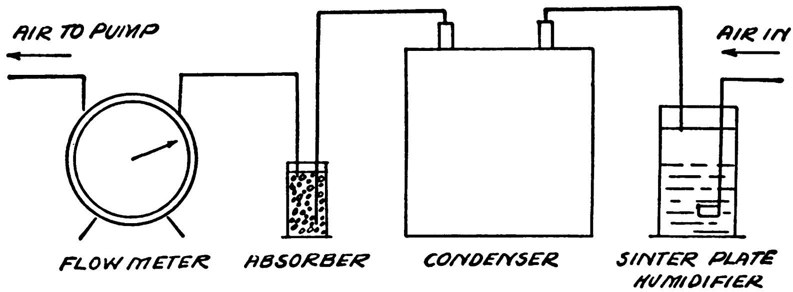

FIGURE 1.—Arrangement of equipment to determine the efficiency of the condenser against water vapor.

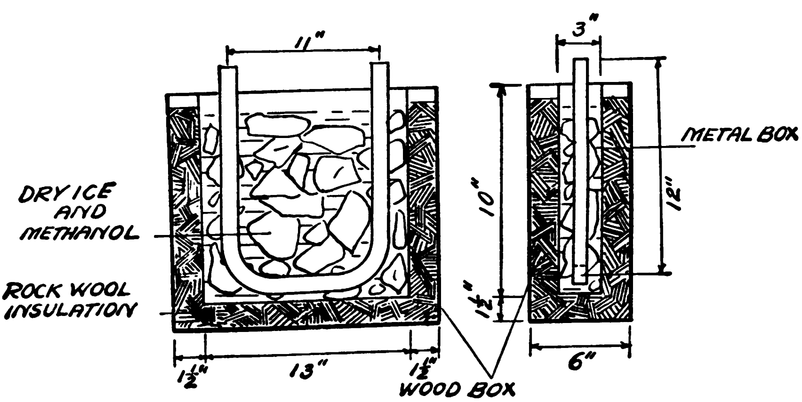

FIGURE 1a.—Design of condenser used in tests.

actually condensed only over a few inches on the inlet side. This tube is immersed in a dry ice-methanol mixture (−78° C.). The air then passes through a tared Fischer absorption tube packed with anhydrous magnesium perchlorate, where any uncondensed vapor is absorbed. The volume of air (dry) is measured by a wet meter.

The test procedure adopted consisted of passing the air sampled through the apparatus shown in figure 1 for a definite time, usually 1 hour, and at the end of this interval replacing the absorption tube. The experiment was carried out with two sets of U-tubes, one 16 mm. and another 21 mm. in inside diameter. The results, shown in table 2 and figure 2, are for runs ranging from 2 to 6 hours.

It is to be noted from the data given in table 2 that the collecting efficiency of water vapor tends to increase with time. This is due to a fine snow which fills the tube and acts as a baffle and filter. At flows exceeding 2 liters per minute, the condensation apparatus is inefficient and the vapor passes the outlet of the U-tube. Runs Nos. 1, 2, and 4 show a high collection of water vapor when the rates of air flow were kept below one liter per minute. The horizontal sections of the

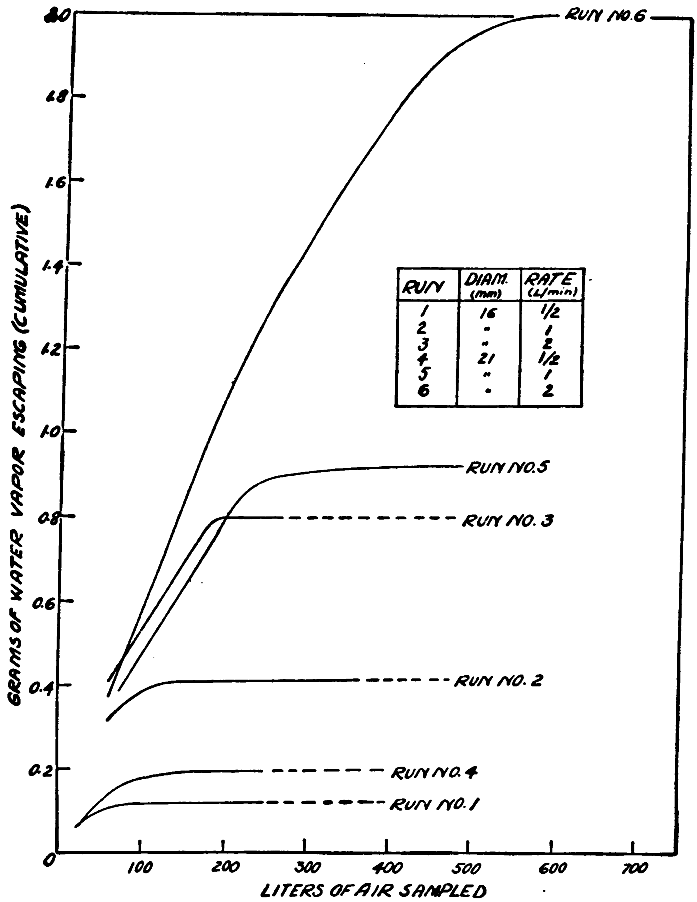

FIGURE 2.—Results of tests made to determine the effectiveness of the condenser apparatus against water vapor.

curve in figure 2 indicate practically no loss of water from the U-tube and, therefore, 100 percent efficiency.

The actual efficiencies are not given in the table, because the total water content of the absorption tube and the U-tube could not be determined accurately under the conditions of these experiments. However, assuming a 200-liter sample and calculating the total amount of moisture in this amount of air at 20° C., we may calculate the probable efficiency of the technique employed. If the air is sat-

TABLE 2.—*Results of water vapor tests by the condensation technique*

Run No.	Inside diameter U tube (mm.)	Rate of flow (liter per minute)	Total time of run (hours)	Cumulative volume of air (liters)	Cumulative water vapor escaping (grams)	Remarks
1	16	½	6	30	0.0798	
				60	.0986	
				92	.1164	
				122	.1164	
				152	.1172	
				182	.1181	
2	16	1	5	63	.3145	
				126	.4052	Tube blocked after another 20 minutes.
				186	.4104	
				250	.4148	
				312	.4148	
3	16	2	2	60	.4073	Tube blocked. rate slowed to 47 liters in last ½ hour.
				182	.7898	
				229	.8028	
4	21	½	6	31	.0671	
				67	.1417	
				97	.1697	
				129	.1873	
				159	.1886	
				190	.1960	
5	21	1	6	72	.3970	
				139	.6005	
				223	.8766	Tube almost completely blocked.
				290	.9073	
				378	.9216	
				455	.9281	
6	21	2	5½	60	.3703	
				182	1.0191	
				305	1.4994	Tube blocked.
				440	1.8925	
				560	2.0046	
				678	2.0109	

urated at this temperature, the concentration of water in it would be 16.9 milligrams per liter. A 200-liter sample of air would then contain 3.4 grams of water. With a 16 mm. tube and sampling at the rate of ½ liter per minute, the total loss of water would amount to 0.1 gram, giving an efficiency of 97 percent. If the rate of sampling is stepped up to 1 liter per minute, then, under these conditions, the efficiency is reduced to 88 percent. Using a 21-mm. tube at ½ liter per minute, the efficiency is 94 percent.

SAMPLING OF BROMINE VAPOR

The efficiency of a 16 mm. U-tube was also tested against bromine. For these runs the set-up was altered, as shown in figure 3. The air was passed over dilute bromine water contained in a glass stoppered bottle. After passing through the U-tube, the air continued through two 250 cc. sintered glass bubblers and then on through the meter and to the pump. The bubblers were filled with 3 percent potassium iodide solution. The amount of iodine liberated by the bromine escaping from the U-tube was determined by titration with N/100 sodium thiosulfate, using starch as an indicator. The results are given in table 3 and figure 4.

It is to be noted that the U-tube is entirely nadequate for the collection of bromine. Bromine freezes at −7.3° C. and boils at 58.8° C. While the freezing point is not greatly below that of water, the vapor

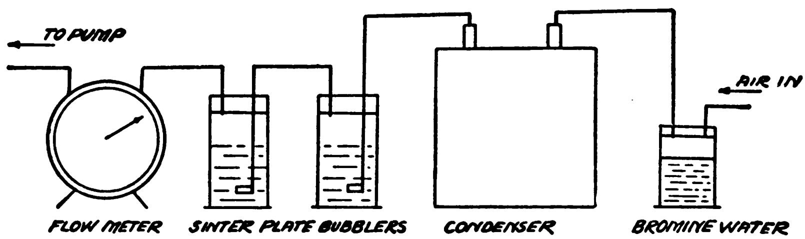

FIGURE 3.—Arrangement of equipment to determine efficiency of condenser against bromine vapor.

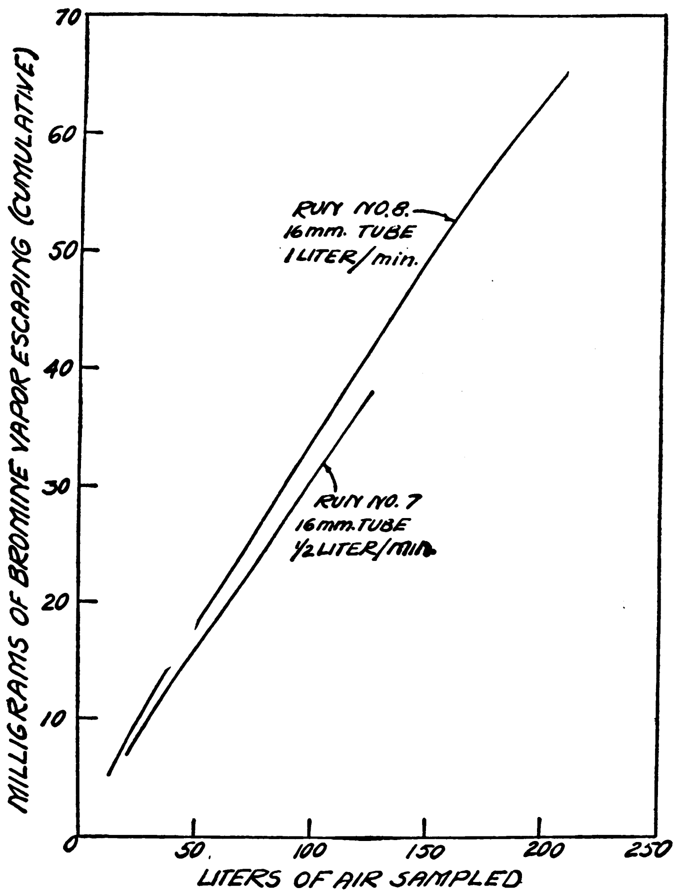

FIGURE 4.—Results of tests made to determine the effectiveness of condenser apparatus against bromine vapor.

pressure is much higher. Thus, the condensation technique described is not adapted to the sampling of substances having a vapor pressure corresponding to bromine (173 mm. at 20° C. and 44.4 mm. at −7.3° C.).

Using a sampling rate of ½ liter per minute, all the bromine is caught in the first bubbler. At 1 liter per minute, only a little over 2 percent is carried into the second bubbler.

TABLE 3.—*Results of bromine vapor tests with condensation technique*

Run No.	Rate of flow (liter per minute)	Total time of run (hours)	Cumulative volume of air (liters)	Cumulative bromine vapor escaping (mg.)	Remarks
7	½	3	30	9.57	7.08 mg. Br left in U-tube at end of run.
			60	18.47	
			90	27.13	
8	1	3½	29	10.72	9.60 mg. Br left in U-tube at end of run.
			90	30.30	
			149	48.62	
			209	65.02	0.24 mg. Br/hour found in second bubbler.

CONCLUSIONS

On the basis of the experiments conducted, the following conclusions seem warranted.

1. A condensation method such as the one here described is adequate for the collection of water vapor in air. When a 16-mm. U-tube is used, with sampling at ½ liter per minute for 200 liters, about 97 percent of the moisture is caught. Increasing the rate of sampling to 1 liter per minute lowers the efficiency to about 88 percent. With a 21-mm. U-tube and a sampling rate of ½ liter per minute, about 94 percent of the moisture is caught.

2. Under these same conditions it may be expected that the efficiency of the tube for the collection of substances having vapor pressures comparable to water, or lower, as, for example, mercury vapor, should be very high.

3. Bromine, or substances having comparable vapor pressures, cannot be collected by the condensation method under the conditions of the experiment. However, bromine can be caught completely with a single sintered glass bubbler in potassium iodide solution when sampled at the rate of ½ liter per minute.

4. These experiments indicate definitely that it is necessary to test any sampling device such as the one described here to determine its efficiency for the particular substance to be collected. The sampling rate, the size of the sample, and the size of the U-tube to be used must be taken into account.

DEATHS DURING WEEK ENDED SEPTEMBER 2, 1939

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 2, 1939	Corresponding week 1938
Data from 88 large cities of the United States:		
Total deaths	7,017	7,081
Average for 3 prior years	[1] 7,138	
Total deaths, first 35 weeks of year	294,131	287,676
Deaths under 1 year of age	482	501
Average for 3 prior years	[1] 494	
Deaths under 1 year of age, first 35 weeks of year	17,685	18,577
Data from industrial insurance companies:		
Policies in force	66,767,749	68,328,766
Number of death claims	10,388	11,048
Death claims per 1,000 policies in force, annual rate	8.1	8.4
Death claims per 1,000 policies, first 35 weeks of year, annual rate	10.4	9.3

[1] Data for 86 cities.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

In these and the following tables, a zero (0) indicates a positive report and has the same significance as any other figure, while leaders (----) represent no report, with the implication that cases or deaths may have occurred but were not reported to the State health officer.

Cases of certain diseases reported by telegraph by State health officers for the week ended Sept. 9, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median

Division and State	Diphtheria				Influenza				Measles			
	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median
NEW ENG.												
Maine	6	1	2	1	----	----	----	----	6	1	1	3
New Hampshire	0	0	0	0	----	----	----	----	0	0	0	0
Vermont	0	0	1	0	----	----	----	----	188	14	1	2
Massachusetts	1	1	3	3	----	----	----	----	15	13	30	15
Rhode Island	0	0	0	0	----	----	----	----	31	4	0	0
Connecticut	0	0	0	1	----	----	----	----	15	5	3	3
MID. ATL.												
New York	5	13	18	18	[1] 1	[1] 1	[1] 1	[1] 3	18	46	74	74
New Jersey	1	1	6	3	4	3	5	5	14	12	13	12
Pennsylvania	5	10	18	21	----	----	----	----	9	17	27	57
E. NO. CEN.												
Ohio	12	15	14	15	1	1	----	2	8	10	12	19
Indiana	28	19	7	12	6	4	14	11	6	4	6	7
Illinois	9	14	11	20	2	3	9	7	9	14	21	21
Michigan [2]	5	5	2	7	----	----	----	----	4	4	13	13
Wisconsin	4	2	2	2	51	29	9	11	39	22	30	30
W. NO. CEN.												
Minnesota	10	5	2	5	4	2	2	----	12	6	13	10
Iowa	4	2	13	5	----	----	5	----	12	6	3	3
Missouri	3	2	15	15	----	----	5	13	0	0	7	6
North Dakota	7	1	0	1	7	1	----	----	7	1	5	5
South Dakota	0	0	2	1	----	----	----	----	15	2	0	0
Nebraska	0	0	0	2	----	----	----	----	4	1	0	1
Kansas	20	7	3	5	----	----	----	1	8	3	4	4

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Sept. 9, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Diphtheria				Influenza				Measles			
	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median
SO. ATL.												
Delaware	0	0	1	0					20	1	0	0
Maryland [3]	9	3	4	4			1	2	3	1	3	4
Dist. of Col.	8	1	4	4			2	1	8	1	2	1
Virginia	84	45	38	31	144	77			9	5	3	8
West Virginia	19	7	10	10	8	3	10	15	3	1	0	2
North Carolina [3]	88	60	79	38			4	2	3	2	15	9
South Carolina [3]	82	30	51	20	522	191	179	94	5	2	6	5
Georgia [3]	56	34	50	26	37	22			2	1	0	0
Florida [3]	27	9	8	8	21	7			12	4	33	2
E. SO. CEN.												
Kentucky	16	9	14	14	9	5	13	3	2	1	3	17
Tennessee	28	16	35	25	19	11	22	22	12	7	3	5
Alabama [3]	72	41	35	31	63	36	26	6	4	2	6	6
Mississippi [2] [3]	66	26	25	19								0
W. SO. CEN.												
Arkansas	37	15	23	9	7	3	12	3	10	4	4	2
Louisiana [3]	12	5	4	4	15	6		3	0	0	3	3
Oklahoma	12	6	14	11	10	5	26	18	8	4	20	2
Texas [3]	20	24	43	38	29	35	94	36	23	28	3	8
MOUNTAIN												
Montana	28	3	0	1	243	26	9	4	9	1	15	3
Idaho	10	1	0	1			6		41	4	6	1
Wyoming	44	2	1	0					44	2	4	1
Colorado	14	3	10	5	48	10			43	9	9	4
New Mexico	74	6	4	2					0	0	0	1
Arizona	0	0	1	2	172	14	14	12	37	3	5	3
Utah [3]	0	0	0	0	20	2	1		119	12	3	2
PACIFIC												
Washington	3	1	1	1					93	30	3	13
Oregon	0	0	1	0	15	3	4	7	20	4	9	4
California	8	10	13	20	9	11	6	12	17	21	74	23
Total	18	455	588	588	24	511	479	346	14	335	495	495
36 weeks	15	13,235	15,998	16,189	200	152,791	47,295	105,025	393	349,706	762,470	670,288

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Sept. 9, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median
NEW ENG.												
Maine	0	0	1	1	0	0	2	2	6	1	0	8
New Hampshire	0	0	0	0	30	8	0	0	0	0	0	2
Vermont	0	0	0	0	27	2	0	1	0	0	7	8
Massachusetts	1.2	1	2	1	6	5	1	1	21	18	23	32
Rhode Island	0	0	0	0	0	0	0	0	15	2	1	3
Connecticut	0	0	1	0	12	4	3	3	6	2	10	8
MID. ATL.												
New York	1.2	3	2	4	35	88	9	20	14	35	61	88
New Jersey	1.2	1	1	1	51	43	2	5	30	25	17	18
Pennsylvania	1.5	3	0	2	10	20	8	8	22	44	90	76
E. NO. CEN.												
Ohio	2.3	3	0	0	13	17	1	2	75	98	52	35
Indiana	0	0	0	2	4	3	1	3	68	46	35	88
Illinois	0.7	1	4	4	9	13	10	22	47	72	92	92
Michigan [3]	0	0	1	2	70	66	4	14	62	59	83	50
Wisconsin	0	0	0	1	9	5	2	4	107	61	46	46
W. NO. CEN.												
Minnesota	0	0	0	0	89	46	3	4	52	27	29	18
Iowa	0	0	0	0	4	2	3	4	14	7	22	19
Missouri	0	0	0	2	0	0	0	2	12	9	20	32
North Dakota	0	0	0	0	7	1	0	0	66	9	11	5
South Dakota	0	0	0	0	0	0	0	2	23	3	9	9
Nebraska	0	0	1	0	4	1	0	0	38	10	13	9
Kansas	0	0	0	0	0	0	0	1	89	32	31	18
SO. ATL.												
Delaware	0	0	0	0	0	0	0	0	0	0	2	1
Maryland [3]	3	1	0	1	6	2	1	1	43	14	14	15
Dist. of Col.	0	0	0	0	24	3	2	0	32	4	1	6
Virginia	1.9	1	2	2	9	5	2	4	36	19	18	18
West Virginia	2.7	1	4	1	2.7	1	0	3	78	29	19	29
North Carolina [3]	1.5	1	2	2	13	9	1	1	50	34	34	34
South Carolina [3]	5	2	0	0	33	12	2	1	44	16	12	5
Georgia [3]	0	0	1	1	0	0	2	0	23	14	13	13
Florida [3]	0	0	2	1	8	1	0	0	15	5	4	4
E. SO. CEN.												
Kentucky	3	2	1	1	5	3	0	4	47	27	44	42
Tennessee	0	0	1	1	5	3	0	3	90	51	28	27
Alabama [3]	1.8	1	1	1	0	0	4	4	60	34	11	13
Mississippi [2, 3]	0	0	1	1	0	0	0	1	28	11	9	9
W. SO. CEN.												
Arkansas	2.5	1	0	1	2.5	1	0	1	25	10	8	8
Louisiana [3]	2.4	1	0	0	2.4	1	0	2	17	7	1	3
Oklahoma	2	1	0	0	4	2	0	0	12	6	13	8
Texas [3]	0	0	2	2	10	12	3	3	20	24	50	24
MOUNTAIN												
Montana	0	0	1	0	0	0	0	1	28	3	4	5
Idaho	0	0	0	0	0	0	0	0	20	2	1	2
Wyoming	0	0	0	0	0	0	0	0	22	1	1	2
Colorado	5	1	5	1	24	5	1	1	39	8	5	8
New Mexico	0	0	0	0	37	3	1	1	86	7	5	5
Arizona	37	3	0	0	61	5	0	1	0	0	5	2
Utah [3]	0	0	0	0	0	0	0	1	60	6	4	4
PACIFIC												
Washington	0	0	0	1	0	0	0	2	40	13	10	10
Oregon	0	0	0	0	20	4	0	0	30	6	4	11
California	0.8	1	0	1	37	45	5	25	42	51	42	64
Total	1.2	29	36	44	17	436	73	294	38	962	1,023	1,023
36 weeks	1.6	1,452	2,250	4,336	4	8,454	1,163	4,982	131	118,940	139,717	167,490

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended Sept. 9, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases	1934–38, median	Sept. 9, 1939, rate	Sept. 9, 1939, cases	Sept. 10, 1938, cases
NEW ENG.											
Maine	0	0	0	0	0	0	3	3	66	11	26
New Hampshire	0	0	0	0	10	1	1	0	0	0	0
Vermont	0	0	0	0	0	0	0	0	268	20	27
Massachusetts	0	0	0	0	4	3	6	5	111	94	65
Rhode Island	0	0	0	0	0	0	0	0	229	30	6
Connecticut	0	0	0	0	3	1	3	2	187	63	52
MID. ATL.											
New York	0	0	0	0	8	19	44	30	126	316	398
New Jersey	0	0	0	0	8	7	6	14	187	157	265
Pennsylvania	0	0	0	0	14	28	18	25	152	299	252
E. NO. CEN.											
Ohio	0	0	1	0	22	29	22	54	128	167	99
Indiana	1	1	3	1	18	12	14	14	86	58	7
Illinois	0	0	0	0	39	59	35	35	149	227	454
Michigan [2]	0	0	1	0	5	5	11	11	138	131	231
Wisconsin	0	0	1	1	7	4	5	5	274	156	383
W. NO. CEN.											
Minnesota	0	0	3	0	0	0	3	3	114	59	43
Iowa	2	1	0	0	12	6	5	5	26	13	16
Missouri	1	1	0	0	6	5	28	28	17	13	24
North Dakota	0	0	0	1	7	1	2	2	110	15	28
South Dakota	15	2	0	0	0	0	0	1	30	4	2
Nebraska	4	1	0	1	0	0	1	1	19	5	11
Kansas	0	0	1	1	20	7	5	11	22	8	49
SO. ATL.											
Delaware	0	0	0	0	79	4	1	1	98	5	9
Maryland [2]	0	0	0	0	19	6	9	11	130	42	17
Dist. of Col.	0	0	0	0	8	1	8	2	89	11	7
Virginia	0	0	0	0	36	19	23	23	73	39	32
West Virginia	0	0	0	0	62	23	31	19	16	6	27
North Carolina [3]	0	0	0	0	13	9	13	15	159	109	147
South Carolina [3]	0	0	0	0	49	18	25	19	98	36	88
Georgia [3]	0	0	0	0	25	15	33	24	53	32	26
Florida [3]	0	0	0	0	3	1	2	2	3	1	14
E. SO. CEN.											
Kentucky	0	0	1	0	47	27	38	52	59	34	74
Tennessee	0	0	0	0	48	27	28	36	49	28	35
Alabama [3]	0	0	1	0	21	12	14	15	25	14	13
Mississippi [2] [3]	0	0	0	0	15	6	7	13	------	------	------
W. SO. CEN.											
Arkansas	0	0	0	0	62	25	24	16	5	2	16
Louisiana [3]	0	0	0	0	27	11	12	19	12	5	40
Oklahoma	0	0	3	1	60	30	29	23	14	7	23
Texas [3]	0	0	3	0	33	40	47	47	41	49	64
MOUNTAIN											
Montana	0	0	1	2	19	2	2	7	94	10	37
Idaho	0	0	0	0	31	3	3	3	41	4	4
Wyoming	0	0	1	1	0	0	1	1	44	2	5
Colorado	10	2	2	2	63	13	13	6	111	23	31
New Mexico	0	0	0	0	62	5	8	7	74	6	7
Arizona	0	0	0	0	135	11	5	5	61	5	4
Utah [2]	0	0	0	0	0	0	2	1	437	44	19
PACIFIC											
Washington	0	0	10	10	6	2	7	3	56	18	20
Oregon	0	0	5	3	25	5	2	5	104	21	26
California	5	6	4	2	12	15	15	15	58	71	116
Total	1	14	41	39	21	517	614	636	100	2,470	3,339
36 weeks	10	8,721	12,810	6,167	10	8,743	9,883	10,010	151	134,239	155,028

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Typhus fever, week ended Sept. 9, 1939, 112 cases as follows: North Carolina, 2; South Carolina, 13; Georgia, 42; Florida, 6; Alabama, 20; Mississippi, 5; Louisiana, 8; Texas, 16.

ROCKY MOUNTAIN SPOTTED FEVER

Cases reported by States, Feb. 26 to Sept. 16, 1939

State	Feb. 26 to Mar. 25	Mar. 26 to Apr. 22	Apr. 23 to May 20	May 21 to June 17	June 18 to July 15	July 16 to Aug. 12	Aug. 13 to Sept. 9	Week ended Sept. 16
Eastern:								
New York				3	8	1	1	1
New Jersey				4	8	7	8	1
Pennsylvania				6	3	4	1	
Delaware				3			1	
Maryland			7	13	11	23	12	
District of Columbia			2	2	2	3	2	
Virginia			1	13	10	11	11	1
West Virginia						1		
North Carolina				3	13	13	6	
Georgia					1	1		
Central:								
Ohio				3	2	4	8	
Indiana				2	1	8	5	1
Illinois			1	1	5	7	1	
Kentucky							6	1
Tennessee					5	5	9	2
Iowa			1	10	9	6	1	
Missouri				1		4	4	
Western:								
Montana	[1] 2	2	8	5	1	2	1	
Idaho		4	7	4	5			
Wyoming		3	14	16	5	5		
Colorado		2	3	9	4			
Arizona							1	
Utah		2	5	5	6	2	1	
Washington		2	3	2				
Oregon		9	16	7	2	1		

[1] 1 other case was reported in Montana as occurring in February, exact date not given.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Diphtheria	Influenza	Malaria	Measles	Meningitis, meningococcus	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid and paratyphoid fever
May 1939										
Puerto Rico	47	50	1,353	16	0	1	0	0	0	40
August 1939										
Connecticut	1	1	2	71	1		6	21	0	15
Delaware	0			3	0		2	1	0	8
Iowa	14	1	8	80	2	1	6	44	13	38
Missouri	12	1	39	3	0		4	46	1	92
New Mexico	3	2	1	2	2		7	16	2	8
Texas	70	109	613	63	11	89	36	61	0	178
West Virginia	18	26	1	10	3	1	2	65	5	56
Wyoming	4	1		36	1		0	6	2	8

Summary of monthly reports from States—Continued

May 1939

	Cases
Puerto Rico:	
Chickenpox	43
Dysentery	13
Mumps	2
Ophthalmia neonatorum	3
Puerperal septicemia	11
Tetanus	14
Whooping cough	93

August 1939

	Cases
Actinomycosis:	
Connecticut	1
Wyoming	1
Anthrax:	
New Mexico	1
Chickenpox:	
Connecticut	34
Delaware	3
Iowa	13
Missouri	6
New Mexico	3
Texas	40
West Virginia	8
Wyoming	2
Colorado tick fever:	
Wyoming	1
Dengue:	
Texas	7
Diarrhea:	
New Mexico	20
Dysentery:	
Connecticut (bacillary)	12
Delaware (bacillary)	1
Iowa (bacillary)	1
Missouri	13
New Mexico (amoebic)	1
New Mexico (bacillary)	14
New Mexico (unspecified)	13

August 1939

	Cases
Dysentery—Continued.	
Texas (amoebic)	15
Texas (bacillary)	122
West Virginia (bacillary)	4
Encephalitis, epidemic or lethargic:	
Missouri	1
Wyoming	1
German measles:	
Connecticut	7
New Mexico	1
Wyoming	3
Hookworm disease:	
Missouri	8
Leprosy:	
Texas	4
Mumps:	
Connecticut	53
Delaware	4
Iowa	19
Missouri	20
Texas	41
West Virginia	8
Wyoming	23
Ophthalmia neonatorum:	
New Mexico	1
Rabies in animals:	
Iowa	2
Missouri	4
Rocky Mountain spotted fever:	
Iowa	5
Missouri	1
West Virginia	1
Wyoming	2
Septic sore throat:	
Connecticut	9
Iowa	6
Missouri	1

August 1939

	Cases
Septic sore throat—Con.	
New Mexico	2
Wyoming	2
Tetanus:	
Connecticut	2
Trachoma:	
Missouri	12
New Mexico	2
Trichinosis:	
Connecticut	3
Tularaemia:	
Iowa	7
Missouri	1
New Mexico	3
Texas	1
West Virginia	1
Wyoming	5
Typhus fever:	
New Mexico	2
Texas	78
West Virginia	1
Undulant fever:	
Connecticut	5
Iowa	19
Missouri	4
New Mexico	1
Texas	44
West Virginia	1
Wyoming	2
Vincent's infection:	
Wyoming	2
Whooping cough:	
Connecticut	274
Delaware	33
Iowa	65
Missouri	88
New Mexico	45
Texas	244
West Virginia	80
Wyoming	10

WEEKLY REPORTS FROM CITIES

City reports for week ended Sept. 2, 1939

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	96	39	12	157	281	270	3	338	89	1,172	
Current week [1]	57	30	5	103	206	201	1	303	56	834	
Maine:											
Portland	0		0	0	1	0	0	0	2	4	24
New Hampshire:											
Concord	0		0	0	0	0	0	0	0	0	11
Manchester	0		0	0	0	0	0	0	0	0	8
Nashua	0		0	0	0	0	0	0	0	0	1
Vermont:											
Barre	0		0	0	0	0	0	0	0	0	2
Burlington	0		0	0	0	0	0	0	0	0	11
Rutland	0		0	0	0	0	0	0	0	0	7
Massachusetts:											
Boston	0		0	9	0	7	0	10	2	23	163
Fall River	0		0	0	1	1	0	0	0	2	27
Springfield	0		0	0	1	0	0	2	1	0	36
Worcester	0		0	0	1	2	0	0	0	0	
Rhode Island:											
Providence	0	1		12	3	0	0	3	0	28	36
Connecticut:											
Bridgeport	0		0	0	0	0	0	1	0	0	18
Hartford	0		0	0	0	0	0	1	0	17	44
New Haven	0		0	2	1	1	0	1	0	7	40

[1] Figures for Springfield, Ill., estimated; report not received.

City reports for week ended Sept. 2, 1939—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
New York:											
Buffalo	0	------	0	1	4	6	0	5	0	4	100
New York	6	1	0	16	26	17	0	61	6	104	1,138
Rochester	0	------	0	0	5	0	0	0	0	2	46
Syracuse	0	------	0	0	0	1	0	0	0	21	44
New Jersey:											
Camden	0	------	0	0	0	1	0	0	0	0	22
Newark	0	------	0	1	2	0	0	8	0	21	74
Trenton	0	------	0	1	2	0	0	1	0	2	23
Pennsylvania:											
Philadelphia	0	------	1	5	13	10	0	11	3	97	339
Pittsburgh	0	------	0	1	5	2	0	15	0	29	169
Reading	0	------	0	0	1	0	0	2	0	0	19
Scranton	0	------	------	0	------	0	0	------	0	3	------
Ohio:											
Cincinnati	0	------	------	0	------	4	0	------	1	11	108
Cleveland	0	1	0	1	3	7	0	9	0	51	158
Columbus	0	------	0	1	2	4	0	0	0	5	48
Toledo	0	------	0	0	3	2	0	3	0	13	69
Indiana:											
Anderson	0	------	0	0	0	0	0	0	0	3	6
Fort Wayne	0	------	0	0	2	1	0	0	1	0	18
Indianapolis	0	------	0	1	9	9	0	4	3	16	106
Muncie	0	------	0	0	2	0	0	0	0	0	13
South Bend	0	------	0	0	0	0	0	0	0	2	17
Terre Haute	0	------	1	0	1	1	0	0	0	0	15
Illinois:											
Alton	0	------	0	0	1	0	0	0	0	0	7
Chicago	9	2	0	6	14	26	0	40	6	81	606
Elgin	0	------	1	0	0	0	0	0	0	5	10
Moline	0	------	0	0	0	0	0	0	0	0	14
Springfield	------	------	------	------	------	------	------	------	------	------	------
Michigan:											
Detroit	3	------	0	5	5	19	0	9	3	83	196
Flint	1	------	0	0	1	1	0	0	2	5	16
Grand Rapids	0	------	0	0	3	4	0	0	1	4	33
Wisconsin:											
Kenosha	0	------	0	0	0	1	0	0	0	2	9
Madison	0	------	0	1	0	1	0	0	0	11	5
Milwaukee	0	------	0	1	0	10	0	3	0	20	95
Racine	0	------	0	0	0	2	0	1	0	6	8
Superior	0	------	0	0	0	1	0	0	0	0	3
Minnesota:											
Duluth	0	------	0	2	0	1	0	0	0	0	19
Minneapolis	0	------	0	2	0	2	0	0	1	2	96
St. Paul	0	------	0	1	7	1	0	1	0	13	63
Iowa:											
Cedar Rapids	0	------	------	1	------	0	0	------	0	0	------
Davenport	0	------	------	0	------	1	0	------	0	0	------
Des Moines	0	------	0	0	0	3	1	0	0	0	31
Sioux City	0	------	------	1	------	0	0	------	0	1	------
Waterloo	1	------	------	0	------	0	0	------	0	2	------
Missouri:											
Kansas City	0	------	0	1	2	2	0	6	1	0	80
St. Joseph	0	------	0	0	0	2	0	1	0	0	23
St. Louis	5	------	0	0	5	2	0	2	0	8	213
North Dakota:											
Fargo	0	------	0	0	1	0	0	0	0	1	3
Grand Forks	0	------	------	1	------	0	0	------	0	0	------
Minot	0	------	------	1	------	0	0	------	0	0	8
South Dakota:											
Aberdeen	0	------	------	2	------	0	0	------	0	7	------
Sioux Falls	0	------	0	0	0	2	0	0	0	0	10
Nebraska:											
Lincoln	0	------	------	0	------	0	0	------	0	1	------
Omaha	0	------	0	0	0	1	0	0	0	0	44
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	1	2
Topeka	0	------	0	0	1	4	0	0	0	0	14
Wichita	1	------	0	2	1	0	0	1	0	3	32
Delaware:											
Wilmington	0	------	0	0	1	1	0	0	0	1	20
Maryland:											
Baltimore	0	------	0	1	3	2	0	7	1	25	152
Cumberland	0	------	0	0	0	2	0	0	0	0	9
Frederick	0	------	0	0	0	0	0	0	0	0	1
Dist. of Col.:											
Washington	1	1	1	2	3	2	0	5	2	29	119

City reports for week ended Sept. 2, 1939—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Virginia:											
Lynchburg	0	------	0	0	0	0	0	0	0	5	9
Norfolk	1	------	0	0	0	1	0	3	0	0	21
Richmond	0	------	0	0	3	0	0	1	0	0	38
Roanoke	0	------	0	0	2	0	0	1	1	0	22
West Virginia:											
Charleston	0	------	0	0	1	1	0	0	2	0	12
Huntington	0	------	------	0	------	0	0	------	2	0	------
Wheeling	0	------	0	0	0	0	0	2	0	2	22
North Carolina:											
Gastonia	3	------	------	0	------	0	0	------	0	0	------
Raleigh	1	------	0	0	0	0	0	0	0	1	9
Wilmington	0	------	0	0	2	1	0	0	0	0	8
Winston-Salem	0	------	0	0	1	1	0	0	0	1	10
South Carolina:											
Charleston	1	------	0	0	1	0	0	2	1	0	23
Florence	0	------	0	0	2	0	0	0	0	0	19
Greenville	0	------	0	0	1	0	0	0	0	0	13
Georgia:											
Atlanta	2	5	1	0	6	3	0	9	0	2	83
Brunswick	0	------	0	0	0	0	0	0	0	0	1
Savannah	0	11	0	0	0	1	0	2	0	2	26
Florida:											
Miami	0	------	0	0	1	0	0	0	0	0	30
Tampa	0	1	0	0	2	0	0	0	0	0	16
Kentucky:											
Ashland	1	------	0	0	0	0	0	0	1	0	7
Covington	1	------	0	0	0	1	0	0	0	0	11
Lexington	0	------	0	0	1	0	0	1	3	0	16
Louisville	1	------	0	0	1	3	0	3	0	18	59
Tennessee:											
Knoxville	1	------	0	0	0	0	0	0	2	0	17
Memphis	0	------	0	2	1	0	0	6	0	15	88
Nashville	0	------	0	0	4	1	0	1	1	10	43
Alabama:											
Birmingham	2	------	0	0	1	4	0	2	0	0	69
Mobile	0	------	0	0	1	0	0	1	0	0	29
Montgomery	0	------	------	0	------	0	0	------	0	0	------
Arkansas:											
Fort Smith	1	------	------	0	------	0	0	------	0	0	------
Little Rock	0	------	0	0	2	0	0	1	0	0	3
Louisiana:											
Lake Charles	0	------	0	0	0	0	0	0	0	0	4
New Orleans	2	1	0	0	6	0	0	9	2	21	154
Shreveport	0	------	0	0	5	0	0	1	1	0	44
Oklahoma:											
Oklahoma City	1	------	0	0	1	3	0	2	2	0	35
Tulsa	0	------	------	1	------	1	0	------	3	0	------
Texas:											
Dallas	2	------	0	1	1	5	0	2	0	1	65
Fort Worth	0	------	0	0	3	6	0	1	1	4	27
Galveston	0	------	0	0	2	0	0	1	1	0	20
Houston	3	------	0	0	2	0	0	10	3	0	88
San Antonio	0	------	0	0	2	0	0	8	1	0	68
Montana:											
Billings	0	------	0	0	1	0	0	0	0	2	9
Great Falls	0	------	0	4	0	0	0	0	0	0	6
Helena	0	------	0	0	0	1	0	0	0	0	3
Missoula	0	------	0	1	0	0	0	0	0	2	8
Idaho:											
Boise	0	------	0	0	2	0	0	0	0	0	10
Colorado:											
Colorado Springs	0	------	0	0	0	0	0	0	0	1	8
Denver	9	------	1	0	5	1	0	5	0	6	88
Pueblo	0	------	0	0	0	0	1	0	0	1	9
Utah:											
Salt Lake City	0	------	0	3	2	0	0	0	0	15	27
Washington:											
Seattle	1	------	0	3	3	1	0	4	0	1	79
Spokane	0	------	0	1	0	4	0	0	0	0	26
Tacoma	0	------	0	4	1	1	0	0	0	0	31
Oregon:											
Portland	1	------	1	1	1	2	0	1	0	0	64
Salem	0	------	------	0	------	0	0	------	0	0	------
California:											
Los Angeles	6	5	0	5	9	13	0	17	3	11	302
Sacramento	1	------	0	0	2	0	0	1	3	0	25
San Francisco	1	1	0	5	6	3	0	7	1	3	156

City reports for week ended Sept. 2, 1939—Continued

State and city	Meningitis, meningococcus Cases	Meningitis, meningococcus Deaths	Poliomyelitis cases	State and city	Meningitis, meningococcus Cases	Meningitis, meningococcus Deaths	Poliomyelitis cases
Massachusetts:				Minnesota:			
Boston	0	0	1	Minneapolis	0	0	15
Rhode Island:				St. Paul	0	0	6
Providence	0	0	1	Kansas:			
New York:				Wichita	0	0	1
Buffalo	0	0	47	District of Columbia:			
New York	1	1	20	Washington	0	0	1
Rochester	0	0	2	Alabama:			
New Jersey:				Birmingham	0	0	1
Camden	0	0	7	Arkansas:			
Pennsylvania:				Little Rock	0	0	1
Philadelphia	0	0	15	Oklahoma:			
Pittsburgh	0	0	2	Oklahoma City	0	0	2
Scranton	1	0	0	Texas:			
Ohio:				Houston	0	0	1
Cincinnati	0	0	1	Colorado:			
Cleveland	0	0	6	Pueblo	0	0	4
Illinois:				Oregon:			
Chicago	0	0	3	Portland	0	0	2
Michigan:				California:			
Detroit	0	0	51	Los Angeles	0	0	20
Grand Rapids	0	0	2	Sacramento	0	0	1
Wisconsin:				San Francisco	0	0	1
Kenosha	0	0	1				
Milwaukee	0	0	2				

Encephalitis, epidemic or lethargic.—Cases: New York, 2; Philadelphia, 2; Milwaukee, 1.

Pellagra.—Cases: Boston, 1; Charleston, S. C., 2; Savannah, 2; Tampa, 1; Birmingham, 1.

Rabies in man.—Deaths: South Bend, Ind., 1.

Typhus fever.—Cases: New York, 1; Charleston, S. C., 3; Atlanta, 7; Savannah, 4; Tampa, 3; Birmingham, 1; Mobile, 4; New Orleans, 1; Fort Worth, 1; San Antonio, 1.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Weeks ended August 5 and 12, 1939.—During the weeks ended August 5 and 12, 1939, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Week ended Aug. 5, 1939

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					3					3
Chickenpox				20	117	10	13	16	20	196
Diphtheria	1		3	10		6	5	3		28
Dysentery									17	17
Influenza					5					5
Measles		3	1	108	128	15	5	1	6	267
Mumps				1	20	9			2	32
Pneumonia		1			7				2	10
Poliomyelitis					11	1	1	1		14
Scarlet fever		9	2	24	30	6	16	16	5	108
Trachoma							1		1	2
Tuberculosis	2	13	22	67	60	3	41	5		213
Typhoid and paratyphoid fever		1	2	12	4		4	1	3	27
Whooping cough		12		110	81	11	27	11	33	285

Week ended Aug. 12, 1939

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				2			1			3
Chickenpox			2	13	41	5	9		18	88
Diphtheria		1	1	31		9				42
Dysentery				3						3
Influenza					5					5
Lethargic encephalitis						1				1
Measles		2	1	199	136	20	3		4	365
Mumps				3	9		1		3	16
Pneumonia		3			6				4	13
Poliomyelitis					13	1		2		16
Scarlet fever		7	2	32	54	7	4	7		113
Tuberculosis	3	17	12	52	18	4	23	3		132
Typhoid and paratyphoid fever		2		11	10		1		2	26
Whooping cough		11	5	72	85	13	22		11	219

CUBA

Habana—Communicable diseases—4 weeks ended August 26, 1939.—During the 4 weeks ended August 26, 1939, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	13	1	Poliomyelitis	5	
Malaria	4		Typhoid fever	31	6

Provinces—Notifiable diseases—4 weeks ended July 22, 1939.—During the 4 weeks ended July 22, 1939, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		1	2	12	1	5	21
Diphtheria	1	20		3		2	26
Hookworm disease		5				5	10
Leprosy		1		1			2
Malaria	14	10	4	17	12	41	98
Measles		1		4		3	8
Poliomyelitis		8					8
Scarlet fever		4	1				5
Tuberculosis	12	42	43	36	19	35	187
Typhoid fever	36	67	42	47	13	53	258
Whooping cough	1			1			2

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—A cumulative table giving current information regarding the world prevalence of quarantinable diseases for a six-month period appeared in the PUBLIC HEALTH REPORTS of August 25, 1939, pages 1573–1585. A similar cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

Cholera

China—Shanghai.—During the week ended September 2, 1939, 36 cases of cholera were reported in Shanghai, China.

Smallpox

Japan—Nagoya.—During the week ended July 29, 1939, 1 case of smallpox was reported in Nagoya, Japan.

Mexico.—During the period July 1 to August 31, 1939, deaths from smallpox have been reported in Mexico, by States, as follows: Aguascalientes, 5; Chiapas, 1; Chihuahua, 1; Durango, 4; Guanajuato, 270; Guerrero, 3; Hidalgo, 9; Jalisco, 3; Mexico, D. F., 1; Mexico, 41; Michoacan, 79; Morelos, 1; Nuevo Leon, 2; Oaxaca, 1; Puebla, 32; Queretaro, 31; San Luis Potosi, 19; Sinaloa, 1; Tlaxcala, 2; Vera Cruz, 1; Zacatecas, 16.

Venezuela—Caracas.—During the period August 1–15, 1939, 10 cases of smallpox (alastrim), with 2 deaths, were reported in Caracas, Venezuela.

Typhus Fever

Egypt—Suez.—During the week ended September 2, 1939, 1 case of typhus fever was reported in Suez, Egypt.

Mexico.—During the period July 1 to August 31, 1939, deaths from typhus fever were reported in Mexico, by States, as follows: Aguascalientes, 4; Coahuila, 5; Durango, 4; Guanajuato, 12; Hidalgo, 19; Jalisco, 7; Mexico, D. F., 9; Mexico, 17; Michoacan, 5; Nuevo Leon, 1; Oaxaca, 16; Puebla, 24; Queretaro, 1; San Luis Potosi, 2; Sonora, 1; Tlaxcala, 3; Vera Cruz, 3; Yucatan, 1; Zacatecas, 14.

×