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COMPARISON OF OCCUPATIONAL CLASS AND PHYSICIANS' ESTIMATE OF ECONOMIC STATUS[1]

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In the absence of a more exact measure of economic status, occupational class is at times utilized as a rough index of differences in ability to purchase goods and services. Occupations as reported on birth and death certificates have generally been found to lack the specificity necessary for classification in any great detail but have often been employed to differentiate a few general classes. Occupation of the father, as recorded on birth certificates, and economic status of the family, as reported by attending physicians in a special survey, are available for approximately 10,000 families from data collected for a study of maternal care in Michigan.[2] Comparison of these families according to occupational class of the head and physicians' estimate of economic status gives some indication as to the extent to which occupational class may be used to differentiate families with respect to social-economic level.

The population of the maternal-care study was defined by the birth certificates registered with the Michigan State Department of Health for all legitimate live births and stillbirths occurring during the first quarter of 1936. For each maternal case the signer of the certificate was requested to record an obstetric history questionnaire, which also inquired into the family's economic status (in qualitative terms—comfortable, moderate, poor) and whether the family had received financial aid in the form of relief. There were 21,568 births; obstetric histories were returned for 10,585 maternal cases or 49 percent of the total. The discussion based on the physicians' estimate of economic status is necessarily limited to consideration of those families for which obstetric histories were returned. Of the histories returned, 97 percent were reported by doctors of medicine, 2 percent by doctors of osteopathy, and 1 percent by other and unspecified types of attendants (including midwives and nurses).

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

[2] Maternal care in Michigan. A study of obstetric practices. National Health Survey, 1935–36, Preliminary Reports, Sickness and Medical Care Series, Bulletin No. 8. National Institute of Health, U. S. Public Health Service, 1938.

Maternal services in Michigan with special reference to economic status. By Jennie C. Goddard and Carroll E. Palmer. Pub. Health Rep., 54: 825 (May 29, 1939).

The groups of families under discussion are predominantly white. Only 4 percent of the families represented in the study of maternal care were colored. Similar proportions of colored were found in the two groups with which comparisons of findings are made, the families canvassed in 1935–36 in Michigan in connection with the National Health Survey and the employed males, 10 years and over, in Michigan, according to the 1930 Census.

The birth certificate used in Michigan in 1936 differed from the standard certificate with respect to the inquiry concerning the parents' occupational histories; the Michigan certificate requested only "occupation (and industry)." For the father, this item was converted into occupational class according to Edwards' social-economic classification.[3]

Certain combinations of Edwards' occupational classes were necessary because the returns lacked sufficient detail for differentiation. Farmers and farm owners were combined with farm laborers to form an agricultural group, since in many instances only "farm" was reported; and factory and building construction laborers were combined with other laborers to form a group of unskilled workers. For each occupational class the percentage distribution by economic status of the family is given in table 1. The corresponding number of families is shown in the appendix, table 1.

TABLE 1.—*Percentage distribution by economic status of 10,000 Michigan families according to occupational class of head (Michigan maternal care study, 1936)*

Occupational class	Comfortable	Moderate[1]	Poor[2]	Unknown	Total
All occupational classes	14.7	42.0	38.2	5.1	100.0
Professional persons	41.7	44.3	11.2	2.8	100.0
Wholesale and retail dealers	36.4	50.2	11.6	1.8	100.0
Other proprietors, managers, and officials	44.6	46.8	6.8	1.8	100.0
Clerks, salesmen, and kindred workers	23.8	52.9	18.5	4.9	100.0
Skilled workers and foremen	16.7	50.5	28.4	4.4	100.0
Semiskilled workers in manufacturing	10.3	49.1	31.8	8.8	100.0
Semiskilled workers not in manufacturing	8.8	50.9	36.1	4.1	100.0
Agricultural workers	14.9	40.8	39.6	4.7	100.0
Unskilled workers	5.5	28.7	61.1	4.8	100.0
Domestic service	5.6	31.1	58.9	4.4	100.0
Unknown	6.9	24.6	63.7	4.8	100.0

[1] Includes 26 families recorded as nonrelief but not specified as to economic status.
[2] All families receiving relief were assumed to be poor.

Little meaning can be attached to the agricultural group as a designation of social-economic status, particularly since the group includes owners and tenants of farms and the agricultural laborers. Because of sharp environmental differences, it has, however, usually been considered advantageous to separate the rural population in some way when studying specific problems among different population groups. The present position of the agricultural group among the

[3] Edwards, A. M.: A social-economic grouping of the gainful workers of the United States. U. S. Bureau of the Census. 1938.

occupational classes was assigned merely on the basis of the proportion of families recorded as poor.

It is evident that the classification of families according to the occupational class of the head gives definitely differentiated groups with respect to their economic status in terms of the physicians' estimate. According to the Michigan experience, however, little loss in the differentiation would result in combining (1) professional and business (professional persons, wholesale and retail dealers, and other proprietors, managers, and officials); (2) skilled and semiskilled workers; and (3) unskilled workers and those in domestic service. The percentage distributions according to the physicians' estimate of economic status are given for these combinations and for the clerical group in the left half of figure 1. Families for which the physicians' estimate was not available were excluded.

Both the physicians' estimate of the family's economic status and the occupational class of the head lack precision as a measure of the family's ability to purchase goods and services. From material collected during the National Health Survey, families comprising a sample of the general population of Michigan may be classified by the more precise measure of annual family income (1935–36) and by occupational class of the head.[4] The distributions of the families by the occupational class of the head from these two sources are not entirely comparable, although Edwards' classification was used for both studies. In the health survey, trained enumerators were instructed to record, in accordance with the census descriptions and definitions, the individual's usual occupation or the one at which he had worked longest. Another limitation is imposed on the comparability of the distributions by the fact that the maternal care study included only those families in which births occurred during one quarter of the year, whereas the health survey included all types of families. Despite these limitations, it seems worth while to compare the percentage distributions of the grouped occupational classes in the two studies according to their respective measures of economic status. These distributions are given in figure 1, families unrecorded as to physicians' estimate and annual family income being excluded. The health survey sample for five cities and two rural areas was adjusted by size of city of residence to the distribution of the maternal care study.

The distribution of health survey families by annual family income shows a close association with the classification by occupational class of the head. Moreover, within any given occupational class the relation of annual family income for health survey families to the occupa-

[4] Unpublished data from the National Health Survey, 1935–36, a house-to-house enumeration of the prevalence and incidence of disabling illness and the receipt of medical care in relation to income, occupation, and other factors among some 800,000 families in 19 States. National Institute of Health, U. S. Public Health Service.

tional class of the head is similar to that of the physicians' estimate of economic status for the maternal care study families. These findings give further substantiation of the conclusion that occupational class of the head is a usable classifying item in differentiating families according to social-economic status.

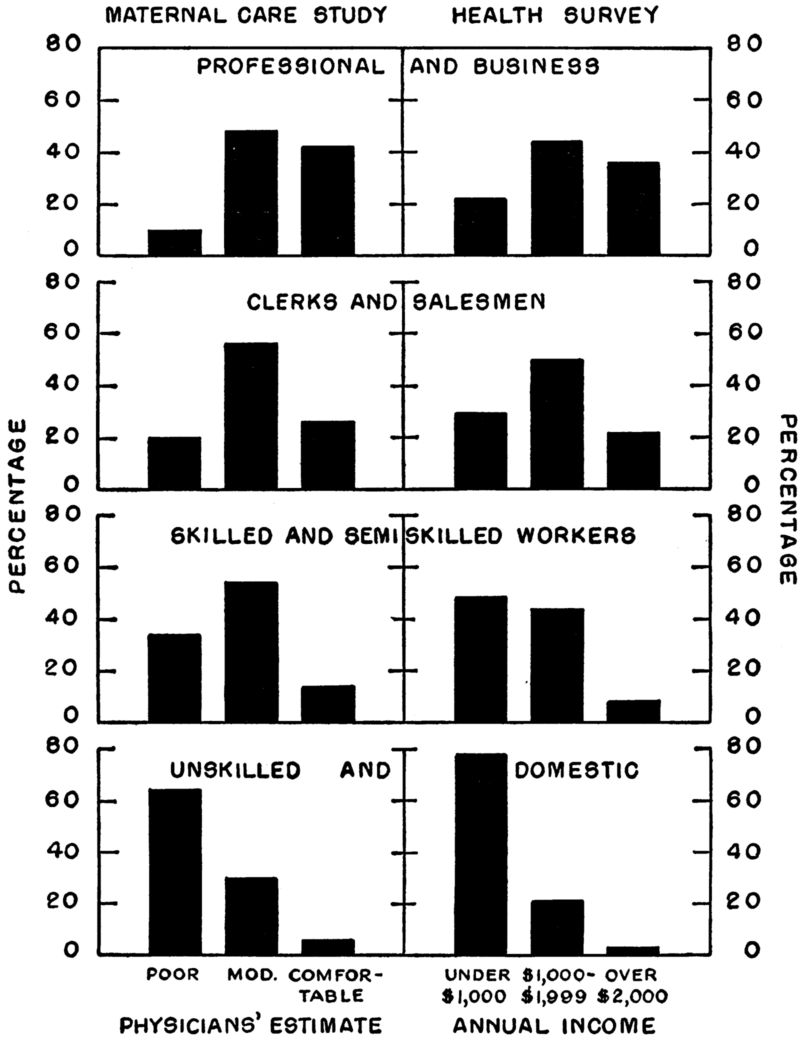

FIGURE 1.—Percentage distribution by physicians' estimate of economic status and by annual family income of families included in maternal care study and in health survey (Michigan), respectively, for certain groups according to occupational class of head.

Receipt of financial aid in the form of relief is important in selecting a group of families of definitely limited financial resources. In table 2 and figure 2 are shown the percentage of the maternal care study families in the individual occupational classes (exclusive of the

TABLE 2.—*Percentage of families receiving relief, according to occupational class of head (Michigan maternal care study, 1936)*

Occupational class	Percentage of families receiving relief	Number of families	
		Receiving relief	With record as to relief status
All occupational classes [1]	14.1	1,344	9,544
Professional persons	4.6	19	411
Wholesale and retail dealers	2.8	9	319
Other proprietors, managers, and officials	1.5	4	271
Clerks, salesmen, and kindred workers	3.3	34	1,015
Skilled workers and foremen	8.0	118	1,470
Semiskilled workers in manufacturing	5.6	89	1,576
Semiskilled workers not in manufacturing	8.7	47	539
Agricultural workers	14.2	165	1,164
Unskilled workers	31.5	669	2,124
Unknown	31.4	183	582

[1] Includes 73 families, 7 receiving relief, with heads employed in domestic service.

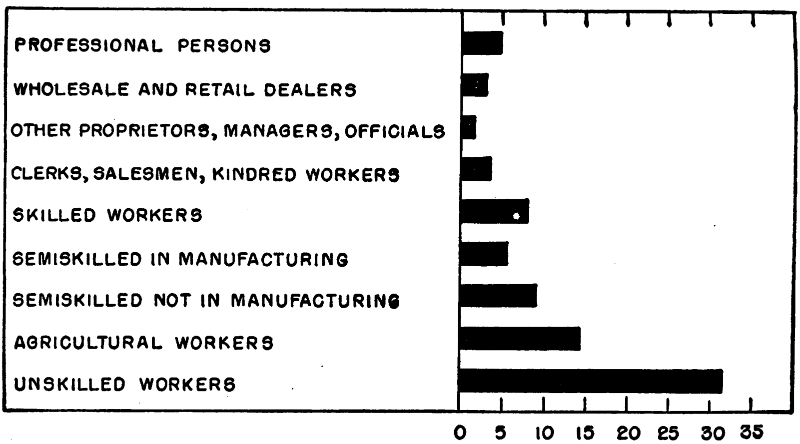

FIGURE 2.—Percentage of families receiving relief according to occupational class of the head of the family.

domestic service group, in which the number of families was small) recorded as receiving relief.[5]

The proportion of families on relief in general tended to increase as social-economic level declined. The proportion among the proprietors, managers, and officials, other than dealers, who were on relief was, however, significantly lower than among the professional persons or the average for the professional and business group. The clerical group received relief with the same frequency as the professional and business group. Although the proportion of the skilled and semiskilled group receiving relief was considerably higher than that of the professional and business or clerical group, the rate for skilled workers was significantly higher than for semiskilled workers in manufacturing and as high as for other semiskilled workers.

[5] Since the inquiry regarding relief did not specify the period to be considered, families on relief at som time during the pregnancy but not at the time of confinement or during the attendant's supervision may not be included in the relief group.

Numerous comparisons of occupational returns on birth and death certificates with those recorded during the decennial census have previously indicated that returns from these sources vary considerably by occupation and, to a less extent, by occupational class. It is of interest to review the distributions by occupational class of the heads of families in the maternal care study and of employed males in Michigan, 10 years of age and over, from the 1930 census.[6] These distributions are given in table 3.

In comparing the above distributions, it should be kept in mind that the two groups are not identical with respect to age and marital status and that the maternal care study was made 6 years after the census enumeration. Moreover, previous investigations have shown that fertility rates vary inversely with social-economic status.

TABLE 3.—*Number and percentage distribution by occupational class of heads of families in maternal care study, 1936, and of employed males, 10 years of age and over, in Michigan in 1930*

Occupational class	Percentage distribution		Number	
	Families in maternal care study	Employed males, 10 years and over	Families in maternal care study	Employed males, 10 years and over
All occupational classes	100.0	[1] 100.0	10,585	[1] 1,545,416
Professional persons	4.0	3.7	427	57,346
Wholesale and retail dealers	3.1	4.0	327	61,395
Other proprietors, managers, and officials	2.6	4.4	278	67,497
Clerks, salesmen, and kindred workers	10.2	12.4	1,084	192,266
Skilled workers and foremen	14.8	22.8	1,567	351,646
Semiskilled workers	22.2	19.0	2,353	293,471
Agricultural workers	12.1	[1] 14.1	1,281	[1] 217,495
Unskilled workers	22.8	17.4	2,409	268,930
Domestic service	.9	2.3	90	35,370
Unknown	7.3	----------	769	----------

[1] Exclusive of 22,109 unpaid family workers on farms.

SUMMARY

The data collected during a study of maternal care in Michigan provided the opportunity to make a comparison for 10,000 families of the distribution by occupational class of the head, derived from birth certificates, against that by economic status of the family, as reported by the person signing the birth certificate. Ninety-seven percent of the certificates were signed by attending physicians. This comparison indicates that classification of families according to occupational class of the head gives definitely differentiated groups with respect to their economic status in terms of the physicians' estimate. Similar results are obtained when families in the general population in Michigan are compared according to annual family income and occupational class of head. In the absence of a more exact measure of ability to purchase goods and services, therefore, occupational class of the head seems to be a useful index of the family's social-economic status.

[6] See footnote 3.

Appendix

TABLE 1.—*Number of families classified by physicians' estimate of economic status of family and occupational class of head (Michigan maternal care study, 1936)*

Occupational class	Nonrelief: Comfortable	Nonrelief: Moderate[1]	Nonrelief: Poor	Relief	Unknown for relief: Poor	Unknown for relief: Unknown economic status	Poor or relief	Total
All occupational classes	1,556	4,444	2,200	1,344	500	541	4,044	10,585
Professional persons	178	189	25	19	4	12	48	427
Wholesale and retail dealers	119	164	27	9	2	6	38	327
Other proprietors, managers, and officials	124	130	13	4	2	5	19	278
Clerks, salesmen, and kindred workers	258	573	150	34	16	53	200	1,084
Skilled workers and foremen	262	791	299	118	28	69	445	1,567
Semiskilled workers in manufacturing	183	870	434	89	40	156	563	1,772
Semiskilled workers not in manufacturing	51	296	145	47	18	24	210	581
Agricultural workers	191	523	285	165	57	60	507	1,281
Unskilled workers	132	691	632	669	170	115	1,471	2,409
Domestic service	5	28	33	7	13	4	53	90
Unknown	53	189	157	183	150	37	490	769

[1] Includes 26 families recorded as nonrelief but not specified as to economic status.

EFFECT OF FLUORIDES ON SALIVARY AMYLASE [1]

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Amylolytic enzymes have been reported to be more active in the presence of fluorides (*1, 2, 3*), to remain unaffected by fluorides (*4, 5, 6, 7*), or to be inhibited in their reactions (*5, 6, 8, 9, 10*). According to Clifford (*5, 6*), the fluorides, KF and NH_4F, were found to cause a marked inhibition of pancreatic and salivary amylase, whereas NaF was inert, up to a concentration of 0.5 M. The contradiction in the results cited above appears to be due to a failure to maintain certain optimum conditions as regards pH and activating electrolyte, known to be required for normal amylolytic enzyme action. The work of Sörensen (*11*), Myrbäck (*12*), and Sherman, Thomas and Baldwin (*13*) demonstrated the extreme sensitivity of amylolytic reactions to slight variations in pH. The optimum pH for salivary amylase in the presence of chloride activation is about pH 6.7. A change to pH 6.0 or 7.5, for example, may inhibit the activity of amylase as much as 25 percent (*12*).

Sherman, Caldwell, and Adams (*14, 15*), studied the optimum pH at which various electrolytes activate salt-free pancreatic amylase. NaF activates salt-free amylase up to 24 percent of the total activation produced by sodium chloride, the optimum pH for 0.10 M, 0.20 M, and 0.30 M NaF activation being 6.3–6.7, 6.6–6.8, and 6.6–6.8,

[1] From the Division of Infectious Diseases, National Institute of Health.

respectively. Myrbäck (*12*) worked with purified amylase also. In the presence of 0.0015 N NaCl he found that 0.03 N KF was without effect on amylolytic action.

The results presented in this paper give no indication of an effect on salivary amylase of quantities of NaF, KF, NH_4F, and Na_2SiF_6 which are undoubtedly physiologically excessive and which are greater than any quantities of fluoride actually encountered under conditions of chronic endemic fluorosis (*16*). A reaction pH of approximately 6.6 was maintained by means of a phosphate buffer, and activation of the enzyme was assured by adding sodium chloride to the substrate prior to testing the effect of fluoride.

The procedure for determining amylolytic activity was as follows: A soluble starch substrate was prepared consisting of 25 cc. of a 1 percent solution of soluble starch (Mallinckrodt's soluble starch was used, the solution being boiled for 3 minutes), 1 cc. of a KH_2PO_4–Na_2HPO_4 buffer (pH 6.6), and 1 cc. of a 1 percent solution of sodium chloride. The volume was made up to 50 cc. in a 50-cc. glass stoppered digestion cylinder and brought to a temperature of 37.5° C. in a constant temperature oven. One cubic centimeter of a 1 to 10 dilution of stimulated saliva was added and the reaction allowed to proceed for exactly one-half hour at 37.5° C. The reaction was stopped by adding 2 cc. of normal HCl, and the contents of the digestion cylinder transferred to an Erlenmeyer flask. The acid was just neutralized with dilute alkali. Total reducing sugars were then determined by titration with standard iodine and thiosulfate, following the procedure recommended by Kline and Acree (*17*). The results are recorded as milligrams of maltose produced.

Two methods for testing the possible effects of fluoride were followed. In one (table 1) the saliva was diluted 1 to 10 with the various fluoride solutions and allowed to stand 1 hour in the cold before measuring enzyme activity, and in the other (table 2), the fluoride solutions were added to the substrate directly, before adding 1.0 cc. of a 1 to 10 water-dilution of saliva. The data presented in table 1 show that concentrations of fluorides varying from 1.7 to 8,550.0 p. p. m. of fluorine in the diluted salivas were without effect on the subsequent activity of the enzyme. Where NH_4F and Na_2SiF_6 were present in high concentrations (table 1) the reactions were not properly buffered by 1 cc. of the usual phosphate buffer (pH 6.6). Inhibition of enzyme activity in these cases is due to a modified pH, but by proper buffering these fluoride salts also may be shown to be innocuous at these levels (table 1).

TABLE 1.—*Effect of fluorides on salivary amylase. Saliva diluted 1 to 10 with fluoride solutions and allowed to stand 1 hour in cold before testing enzyme activity*

Fluoride	F in diluted saliva (p. p. m.)	F present during reaction (p. p. m.)	pH of reaction		Reducing sugars calculated as maltose (mg.)		Enzyme activity compared as per-cent of control	
Saliva sample			F. J. M.	W. S. M.	F. J. M.	W. S. M.	F. J. M.	W. S. M.
Control	0.0	0.0	6.5	6.6	107.8	99.6	100.0	100.0
NaF	8550.0	171.0	6.6		109.1	99.2	101.2	100.4
Do	1710.0	34.2			108.3	101.3	100.5	101.7
Do	171.0	3.4			105.8	102.9	98.1	103.3
Do	17.1	.3			102.9	99.4	95.5	99.8
Do	1.7	.03			105.5	100.4	97.9	100.8
Control	0.0	0.0	6.6	6.6	114.4	94.9	100.0	100.0
KF	8550.0	171.0	6.6		115.6	94.8	101.0	99.9
Do	1710.0	34.2			110.1	96.9	96.2	102.1
Do	171.0	3.4			113.3	97.4	99.0	102.6
Do	17.1	.3			110.5	96.8	96.6	102.0
Do	1.7	.03			112.0	96.7	97.9	101.8
Control	0.0	0.0	6.6	6.6	106.8	93.5	100.0	100.0
NH_4F	8550.0	171.0	5.8	5.6	94.5	53.8	88.5	57.5
Do	1710.0	34.2		6.4	108.3	93.9	101.4	100.4
Do	171.0	3.4			104.5	97.7	97.8	104.4
Do	17.1	.3			104.6	96.8	97.9	103.5
Do	1.7	.03			101.8	95.2	95.3	101.8
Control	0.0	0.0	6.6	6.6	105.5	92.9	100.0	100.0
Na_2SiF_6	8550.0	171.0	3.7	3.6	12.2	12.9	11.6	13.9
Do	1710.0	34.2	3.8	3.8	16.7	17.0	15.8	18.3
Do	171.0	3.4		6.3	103.7	91.9	98.3	98.9
Do	17.1	.3			104.8	92.5	99.3	99.5
Do	1.7	.03			108.2	92.2	102.5	99.2
Control	0.0	0.0	6.6	6.8	97.0	96.6	100.0	100.0
Na_2SiF_6	8550.0	171.0	6.5	6.9	92.6	95.7	95.4	95.9
Do	1710.0	34.2	6.6	7.0	98.2	94.1	101.2	94.1
NH_4F	8550.0	171.0	6.5		104.1	99.0	107.3	102.4

TABLE 2.—*Effect of fluorides on salivary amylase. Fluorides present during enzyme-substrate reaction*

Fluoride	F present during reaction (p. p. m.)	pH of reaction		Reducing sugars calculated as maltose (mg.)		Enzyme activity compared as per-cent of control	
Saliva sample		F. J. M.	W. S. M.	F. J. M.	W. S. M.	F. J. M.	W. S. M.
Control	0.0	6.6	6.6	104.7	101.3	100.0	100.0
NaF	3,800.0	6.5		94.7	87.6	90.4	86.5
Do	760.0	6.5	6.4	103.5	95.6	98.9	94.4
Do	76.0	6.6	6.6	97.9	99.4	90.9	98.1
Do	7.6	6.6	6.6	107.8	100.8	100.1	99.5
Do	.76	6.6	6.6	103.7	97.4	96.3	96.2
Control	0.0	6.6	6.6	112.4	99.2	100.0	100.0
KF	3,800.0		6.9	96.8	100.5	86.1	101.3
Do	760.0		6.4	104.2	94.9	92.7	95.6
Do	76.0		6.5	109.9	97.6	97.8	98.3
Do	7.6			110.8	98.7	98.6	99.4
Do	.76			111.2	95.5	98.9	96.2
Control	0.0	6.6	6.6	110.3	99.9	100.0	100.0
NH_4F	3,800.0	6.1		24.6	29.2	22.3	29.2
Do	760.0	5.4	5.5	46.3	35.9	42.0	35.9
Do	76.0	6.3		110.6	86.6	100.2	86.7
Do	7.6	6.6		111.3	98.1	100.9	98.2
Do	.76			112.9	100.3	102.3	100.4

TABLE 2.—*Effect of fluorides on salivary amylase. Fluorides present during enzyme-substrate reaction*—Continued

Fluoride	F present during reaction (p. p. m.)	pH of reaction		Reducing sugars calculated as maltose (mg.)		Enzyme activity compared as percent of control	
Saliva sample		F. J. M.	W. S. M.	F. J. M.	W S. M.	F. J. M.	W. S. M.
Control	0.0	6.6	6.0	108.3	96.9	100.0	100.0
Na_2SiF_6	3,800.0	3.7		0.0	0.0	0.0	0.0
Do	760.0	3.6	3.6	0.0	0.0	0.0	0.0
Do	76.0	3.6	3.6	18.3	15.3	16.9	15.8
Do	7.6	5.5		84.0	74.9	77.6	77.3
Do	.76	6.4		108.5	97.2	100.1	100.3
Control	0.0	6.6		110.1	96.8	100.0	100.0
Na_2SiF_6	760.0	6.5	6.2	102.8	84.4	93.4	87.2
Do	76.0	6.5		95.3	99.0	86.6	102.3
Do	7.6		6.8	102.8	96.8	93.4	100.0
Control	0.0	6.6		116.2	93.8	100.0	100.0
NH_4F	760.0	6.8		108.4	87.2	93.3	93.0

The results presented in table 2 show no effect of NaF, KF, NH_4F' and Na_2SiF_6 in concentrations equaling 0.76, 7.6, 76.0, and 760.0 parts per million of fluorine. Sodium fluoride and KF were inert up to concentrations equal to 3,800 parts per million of fluorine. The inhibition caused by NH_4F and Na_2SiF_6 at fluorine concentrations equaling 3,800 parts per million of fluorine was not investigated further, since such quantities are in great excess physiologically. Substrates containing Na_2SiF_6 in concentrations equaling 7.6, 76.0, and 760.0 parts per million of fluorine as well as substrates containing NH_4F in a concentration equal to 760 parts per million of fluorine required special buffering before normal amylolytic action was obtained.

EFFECTS OF FLUORIDES IN DRINKING WATER

The presence of fluorides in drinking water is the cause of endemic mottled enamel (*16*), and there may be other toxic effects resulting from the ingestion of fluorides. According to the enzyme studies presented above, unabsorbed fluorides in the drinking water will not affect the reaction of salivary amylase in the human system. However, there remained the possibility of a physiological effect of fluorides absorbed from drinking water and food on the salivary amylase as secreted. The following data throw light on this latter question.

In connection with a recent dental survey conducted by Dean et al. (*18*), saliva specimens from a group of school children whose drinking water contained on the average 1.8 parts per million of fluorine (Galesburg, Ill.) were available for determination of amylolytic activity. These specimens were compared with a number of other specimens collected under similar conditions from children whose drinking water contained no fluorine (Quincy, Ill.). The two groups of salivas were packed in ice and were received at the laboratory in Washington, D. C., at temperatures of 7° C. and 10° C., respectively. Amylase was determined according to the method outlined above, except that Merck's soluble starch, according to Lintner, was used instead of the Mallinckrodt product. Slightly more maltose resulted from the use of the Merck starch. A total of 63 specimens of saliva from children living in Quincy, Ill., averaged 105.9 ± 5.2 mg.[2] of maltose, as compared with an average of 108.7 ± 3.1 mg. of maltose for 82 specimens from children living in Galesburg, Ill. These results include all salivas from each group, although the individual data indicate that a number of salivas from each group may have deteriorated after the time of collection in spite of the low temperature maintained. Figures for total maltose, which were somewhat less than 90 mg., were thought to be evidence of a loss of amylolytic activity following collection of the saliva. This may or may not be the case. Only a limited number of data are available from which to determine what variations may occur normally among a group of individual salivas. Among the above data, 17.4 percent of the results obtained on the samples of saliva from Quincy showed less than 90 mg. of maltose, and 14.6 percent of the samples from Galesburg gave less than 90 mg. of maltose (table 3). An upper limit of 137 mg. of maltose was obtained in one saliva sample. The following table gives information regarding the general consistency of the data.

TABLE 3.—*Distribution of the saliva specimens by cities according to maltose producing activity expressed in milligrams*

Maltose (mg.)	Galesburg		Quincy	
	Number	Percent of total	Number	Percent of total
(45)-50	0	0.0	4	6.3
50-90	12	14.6	7	11.1
90-100	5	6.1	6	9.5
100-110	16	19.5	11	17.5
110-120	27	32.9	22	34.9
120-130	16	19.5	7	11.1
130-(137)	6	7.3	6	9.5
	82	------------	63	------------

The means of these distributions, i. e., 105.9 ± 5.2 mg. for Quincy and 108.7 ± 3.1 mg. for Galesburg, show no statistically significant differences. It may be said with reasonable assurance that fluoride ingestion, brought about by the use of a domestic water supply containing approximately 1.8 parts per million of fluorine, does not

[2] The following formula was used to compute the probable error of the mean:

$$P.\ Em. = .6745\sqrt{\frac{\Sigma d_2}{N\ (N-1)}}$$

P. Em. = probable error of mean.

Σd_2 = sum of the squared individual deviation from the mean.

N = total number of samples in the series.

change the final amylolytic activity of the saliva secreted under these conditions.

CONCLUSIONS

The fluorides, NaF, KF, NH_4F, and Na_2SiF_6, were found to have no effect on the activity of salivary amylase in concentrations varying from 1.7 to 8,550 parts per million of fluorine present in 1 to 10 dilutions of salivas which stood for 1 hour in the cold prior to testing amylolytic property. The same fluorides, when present in the enzyme-substrate mixture during the digestion period, in concentrations varying from 0.76 to 760 parts per million of fluorine in the substrate, had no final effect on enzyme activity. The salivas of school children whose drinking water contained an average of 1.8 parts per million of fluorine showed no differences in amylolytic action from a similar group of salivas obtained under similar conditions from school children whose drinking water was free from fluoride.

ACKNOWLEDGMENT

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THE CULTIVATION OF *RICKETTSIA DIAPORICA* IN TISSUE CULTURE AND IN THE TISSUES OF DEVELOPING CHICK EMBRYOS*

By HERALD R. COX, *Associate Bacteriologist*, and E. JOHN BELL, *Laboratory Assistant, United States Public Health Service*

In a previous publication (*1*) it was stated that the filterable infectious agent isolated from *Dermacentor andersoni* and now called *Rickettsia diaporica* (*2*) could be readily cultivated and maintained serially in modified Maitland tissue cultures.

In the present paper observations are presented of the growth of this organism in modified Maitland cultures and in the tissues of the developing chick embryo (*3*).

TECHNIQUE

Tissue cultures.—Numerous modifications of Tyrode's and Baker's (*4*) solutions [1] were tried. The best and most consistent results were obtained with filtered human ascitic fluid or Baker's solution containing 50 percent ascitic fluid. The tissues employed were minced yolk-sac, chorio-allantoic membrane, or the embryo proper from chick eggs incubated at 39.4° C. for 9 or 10 days. Fifty-cc. Erlenmeyer flasks containing approximately 4 cc. of suspension medium and 0.1 gram of minced tissue were used.

The original inoculum was 0.5 cc. of a Berkefeld N or W filtrate of the supernatant portion of a centrifuged (2,500 to 3,000 r. p. m. for 15 minutes) [2] 5-percent suspension of infected guinea pig spleen in Tyrode's solution. The culture flasks, either stoppered with rubber stoppers and sealed with paraffin or plugged with cotton and capped with tin foil, were incubated at 37° C. Subcultures were made at intervals of 8 to 14 days, the dilution factor being approximately 1 to 10 at each transfer (0.4 cc. of material from previous culture).

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

1 Various modifications of Tyrode's and Baker's solutions to which were added from 10 to 50 percent of horse, cow, guinea pig, rabbit, or chicken sera, as well as whey, chick amniotic fluid, chick embryo extract, and human amniotic or ascitic fluid were tried.

2 A 51° angle centrifuge was used in all experiments.

Inoculation of developing chick embryos.—Eggs that had been incubated at 39.4° C. for 5 or 6 days were injected in the yolk by the technique previously described (*3*). The same inoculum was used as in the tissue culture series. The inoculated eggs were incubated at 35° C. and transfers made every 5 to 9 days by using 0.5 cc. of a 10-percent suspension of the yolk-sac in normal saline.

Titration tests of tissue cultures.—Several flask cultures of the same transfer were pooled and centrifuged (2,500 to 3,000 r. p. m. for 15 minutes) to throw down tissue fragments. The supernatant fluid was carefully pipetted off and saved. The cellular sediment was ground with sterile alundum to a homogeneous suspension and then resuspended in the supernatant fluid and again similarly centrifuged to throw down all gross particles and tissue debris. The supernatant fluid (undiluted culture material) was carefully pipetted off, diluted decimally with Tyrode's or with a mixture containing equal parts of Tyrode's and ascitic fluid, and each dilution was tested by injecting guinea pigs intraperitoneally or subcutaneously with 1 cc. each.

Titration tests of tissues of developing chicks.—The selected material (yolk-sac, chorio-allantois, or embryo proper) was removed aseptically from 3 or 4 eggs of the same transfer and washed once or twice with sterile saline to remove yolk or other fluid. The tissue material was then drained, pooled, weighed, and ground. The ground tissue was diluted with Tyrode's, or a mixture of Tyrode's and ascitic fluid, to make a 10-percent suspension and the latter centrifuged (2,500 to 3,000 r. p. m. for 15 minutes) to throw down tissue fragments. The supernatant fluid was then diluted and tested by animal inoculation in a manner similar to that used for the tissue cultures.

TISSUE CULTURE DATA

Five series of cultures (A, B, C, D, and E) were initiated and carried in the minced tissues of the chick embryo, two (F and G) in minced yolk-sac tissue and one (H) in minced chorio-allantoic tissue; ascitic fluid was the suspension medium. Series A was carried through 18 transfers, B through 14, C through 12, D, E, and F through 22 each, G through 38, and H through 18.

Multiplication of rickettsiae occurred in each series but the best and most consistent growth was obtained in cultures prepared with minced yolk-sac tissue.

Infectivity tests.—Repeated titration tests showed that yolk-sac cultures consistently reached a higher infective titer than did cultures prepared with minced embryo or chorio-allantois.

Thus, the limit of infectivity of yolk-sac cultures was, as a rule, 10^{-7} or 10^{-8} while cultures of chorio-allantois and embryo were generally 100 to 1,000 fold and occasionally even 10,000 or 100,000 fold less infectious. Only twice did cultures of minced embryo reach a titer of 10^{-8}, while cultures of chorio-allantois reached a titer of 10^{-7} only once.

Presence of rickettsiae.—In cultures prepared from minced embryo or chorio-allantoic tissues, rickettsiae were never found until the third or fourth transfer. They first appeared in small numbers both extracellularly and intracellularly. As a rule further transfers showed rickettsiae present in increasing quantities. The greatest number of rickettsiae were found from the eighth to twelfth days and occasional cultures showed thousands of organisms in an oil-immersion field.

A few of the cultures prepared with minced embryo showed occasional well preserved cells containing rickettsiae in the cytoplasm. Individual bipolar rods or diplobacillary forms were found singly or diffusely distributed in small groups. Also small spherical clusters or nests of less discrete organisms were observed. The cytoplasm of some cells contained large oval vacuoles within which were large numbers of rickettsiae. In a few instances nuclei were observed which appeared to be vacuolated, and sharply stained forms, indistinguishable from the bipolar forms commonly observed, could be seen in the vacuoles. Thus the picture is similar to that observed in infected guinea pig tissues (*1*).

The yolk-sac series of cultures showed differences in that rickettsiae were found in the initial cultures and successive transfers usually showed rickettsiae present in numbers even greater than in the best of the embryo or chorio-allantois cultures. The greatest number were present on the eighth to twelfth day, at which time practically all were extracellular owing to the rapid disintegration of yolk-sac tissue. However, a certain number of fairly well preserved cells were found in smears prepared on the fourth to sixth days. These were cells that line the yolk-sac and possess a highly vacuolated cytoplasm. In them rickettsiae may be seen only in the anastomosing cytoplasmic strands which make up the major portion of the cell. Intranuclear rickettsiae were not observed in any of the yolk-sac cultures.

Other tissue culture experiments. Comparison of growth in cotton and rubber stoppered flasks.—An experiment was made to determine whether this rickettsia could be cultivated like a typical filterable virus, that is, in cotton stoppered flasks with transfers being made every 3 or 4 days. Four different culture combinations were tried, minced chick embryo or yolk-sac tissue suspended in ascitic fluid or in a modified Baker's solution containing 20 percent chicken serum. For comparison two series of cultures consisting of minced embryo or yolk-sac suspended in ascitic fluid were prepared in rubber stoppered flasks and similarly transferred every 3 or 4 days, while a third series of yolk-sac cultures in rubber stoppered flasks was passed every 8 or 9 days.

Table 1 summarizes the results obtained in titration tests carried out with the above culture preparations.

The data show that 3 of the 4 series of the cotton stoppered flask cultures were successfully carried through 15 transfers, but that the cultures consisting of minced embryo in modified Baker's solution were not active beyond the third passage. Those of yolk-sac suspended in ascitic fluid gave the highest average titer (10^{-5}). A slightly higher titer (10^{-6}) was reached by similarly prepared cultures in rubber stoppered flasks, while the best results (titer of 10^{-8}) were obtained by incubating the yolk-sac cultures in rubber stoppered flasks for 8 or 9 days before transferring.

TABLE 1.—*Comparative titration end-points of tissue cultures prepared in rubber stoppered and cotton stoppered flasks*

Type of culture	Tissue used	Suspension medium	Transfer interval, in days	Transfer number (in parentheses) and end-point of titration				
Cotton stoppered	Embryo	Baker's solution with 20 percent chicken serum.	3 to 4	10^{-1} (3)	[1] (6)	[1] (9)	------	------
Do	Yolk-sac	do	3 to 4	10^{-4} (3)	10^{-3} (6)	10^{-4} (9)	10^{-5} (12)	10^{-4} (15
Do	Embryo	Ascitic fluid	3 to 4	10^{-3} (3)	10^{-2} (6)	10^{-3} (9)	10^{-3} (12)	10^{-3} (15)
Do	Yolk-sac	do	3 to 4	10^{-5} (3)	10^{-6} (6)	10^{-5} (9)	10^{-5} (12)	10^{-5} (15)
Rubber stoppered	Embryo	do	3 to 4	10^{-3} (3)	10^{-4} (6)	10^{-3} (9)	10^{-3} (12)	10^{-3} (15)
Do	Yolk-sac	do	3 to 4	10^{-5} (3)	10^{-6} (6)	10^{-5} (9)	10^{-6} (12)	10^{-6} (16)
Do	do	do	8 to 9	10^{-7} (3)	10^{-8} (7)	10^{-8} (10)	10^{-8} (16)	10^{-8} (20)

[1] These cultures produced no reaction in guinea pigs and the latter were not immune.

Microscopic observations showed that relatively few rickettsiae were present in the cotton stoppered, minced-embryo cultures, and occasionally cultures were encountered in which only one or two organisms could be found in an oil-immersion field. The 3 or 4 day passage yolk-sac cultures (both cotton and rubber stoppered flasks) showed many typical organisms, but in addition these cultures contained relatively large numbers of very minute, faintly stained, short rod or coccoid forms existing both intra- and extracellularly. These minute forms were rather consistently observed in the 3 or 4 day transfer cultures and it is believed that they represent a smaller form of the organism. These minute forms were only rarely present in the cultures transferred every 8 or 9 days.

A second experiment was performed to compare the yield of rickettsiae when both cotton and rubber stoppered flask cultures were transferred every 8 or 9 days. Minced embryo and yolk-sac suspended in ascitic fluid were again used. No significant difference in the number of rickettsiae was now observed, but the cotton stoppered cultures did show a considerable loss of volume due to evaporation of the suspension medium. The yolk-sac cultures again showed better growth of rickettsiae than the embryo cultures.

Growth under complete hydrogen tension.—Two experiments were carried out in an attempt to grow rickettsiae in yolk-sac-ascitic fluid cultures in cotton stoppered flasks under complete hydrogen tension in a McIntosh-Fildes jar. Animal inoculation tests and microscopic examinations showed that rickettsiae were present in the first subculture but not in the second or succeeding subcultures.

Growth in the tissues of the developing chick embryo.—A passage strain of *Rickettsia diaporica* has been readily maintained in the developing chick embryo for over 50 serial transfers. In the first 9 transfers, the embryo remained alive until the seventh or eighth day, but the strain gradually increased in virulence so that toward the thirtieth transfer most embryos were dying on the fifth or sixth day.

Infectivity tests.—The titration tests of modified Maitland cultures already described have clearly shown that yolk-sac cultures are more infectious than cultures containing other tissues of the developing chick. However, yolk-sac suspensions from inoculated eggs show infective titers 10 to 1,000 times greater than even the best of the yolk-sac tissue cultures.

Table 2 summarizes some of the results of titration tests of various chick embryo tissues. The data show that yolk-sac suspensions regularly contain at least a billion infectious units per gram of tissue and titers as high as 10 and 100 billion have been obtained.

TABLE 2.—*Comparative titration end-points of tissues of the developing chick*

Transfer number	Tissue titrated	Titration end-point	Transfer number	Tissue titrated	Titration end-point
10	Embryo	10^{-7}	32	Embryo	Not tested.
	Chorio-allantois	10^{-7}		Chorio-allantois	Not tested.
	Yolk-sac	10^{-11}		Yolk-sac	10^{-10}
14	Embryo	10^{-6}	38	Embryo	10^{-5}
	Chorio-allantois	10^{-7}		Chorio-allantois	10^{-6}
	Yolk-sac	10^{-9}		Yolk-sac	10^{-9}
18	Embryo	2×10^{-7}			
	Chorio-allantois	2×10^{-7}			
	Yolk-sac	2×10^{-10}			

This rickettsia shows similarity to all the other rickettsiae thus far studied in that yolk-sac suspensions produce in guinea pigs a shortened incubation period and a more severe infection (*3*). Thus, guinea pigs receiving a subcutaneous or intraperitoneal injection of 1 cc. of a 10-percent yolk-sac suspension of *R. diaporica* as a rule show fever within 24 to 48 hours and die 7 to 12 days later, whereas animals similarly injected with a 10-percent spleen suspension rarely show fever before the fourth day and frequently die 2 to 3 weeks after the temperature has become normal.

Presence of rickettsiae.—No rickettsiae were found in tissue smears of eggs of the first 4 transfers. Beginning with the fifth passage, however, yolk-sac smears showed tremendous numbers of faintly staining, minute, rod-like or coccoid forms both intra- and extracellularly. These forms were indistinguishable from those observed in the modified Maitland, yolk-sac cultures transferred every 3 or 4 days. Smears similarly prepared from the chorio-allantois and embryo proper showed no organisms. Smears prepared from yolk-sac of the sixth passage eggs showed large numbers of the minute forms, but in addition there were considerable numbers of bipolar rods, diplococcoid and diplobacillary forms. Also a few chain forms, each containing 5 or 6 short rods, were seen. Nearly all organisms were extracellular. Beginning with the eighth transfer tremendous numbers of the larger forms were seen in yolk-sac smears, while markedly fewer organisms were found in smears prepared from the chorio-allantois and tissues of the embryo proper.

FILTERABILITY OF CULTURES

Centrifuged suspensions of yolk-sac tissue in Tyrode's representing the fourteenth and twenty-second passages in eggs were passed through new Berkefeld N filters and the filtrates inoculated into eggs. In both experiments the filtrates were centrifuged at 5,000 r. p. m. for 1 hour and the sediments stained with Giemsa and examined microscopically. No rickettsiae were found. However, large numbers of typical rickettsiae and also of the minute fcrms were found in smears of yolk-sac tissue prepared from the inoculated eggs. Subsequent passages in eggs showed the typical picture of tremendous numbers of rickettsiae in the yolk-sac tissue.

Our inability to demonstrate visible organisms in filtrates or in filtrate sediments suggests that there is an invisible, filterable phase of the organism that we are unable to observe microscopically.

DISCUSSION

The results of these experiments show that *Rickettsia diaporica* grows more readily in yolk-sac than in other tissues of the developing chick embryo or in modified Maitland cultures. Similar findings have previously been reported for rickettsiae of the Rocky Mountain spotted fever and typhus groups (*3*, *5*, *6*). *R. diaporica*, however, has shown more profuse growth, and yolk-sac suspensions prepared from the developing chick have given infective titers higher than any of the other rickettsiae thus far studied. The nearest approach to the exceedingly high titers recorded for *R. diaporica* have been obtained with yolk-sac suspensions of the rickettsiae of "Q" fever and of endemic and epidemic typhus (*6*). These latter agents have rather consistently maintained an infective titer of 1 : 1 billion when grown in the yolk-sac of the developing chick.

In conjunction with Dr. C. B. Philip, of this laboratory, it has recently been found that the viscera and feces of infected adult and nymphal *Dermacentor andersoni* contain tremendous numbers of *R. diaporica*, and titration tests with these materials have given infective titers as high as those recorded for suspensions of the yolk-sac of the developing chick (*7*). The great number of rickettsiae found in the yolk-sac of inoculated eggs and in infected tick tissues and feces has made it possible to prepare from each of these sources, by fractional centrifugation, practically pure suspensions of rickettsiae suitable for agglutination purposes. Moreover, vaccines which protect guinea pigs against the experimental disease have been prepared from each of these sources (*6, 7*).

SUMMARY

Experiments are described in which *Rickettsia diaporica* was cultivated in a variety of tissue cultures consisting of various chick embryonic tissues in different suspension media. Both cotton stoppered and rubber stoppered flasks were used. The best results were obtained with rubber stoppered flasks containing minced yolk-sac tissue suspended in filtered human ascitic fluid, transfers being made every 8 to 12 days. By this method a series of cultures has been carried through 38 consecutive transfers with the infective titer being maintained rather consistently at 1×10^{-7} to 1×10^{-8}. Tissue cultures prepared with minced chorio-allantois or embryo proper as a rule showed fewer rickettsiae and an infective titer 100 to 1,000 times less.

This rickettsia apparently cannot be cultivated under complete hydrogen tension.

A passage strain of *R. diaporica* has been readily maintained in serial passage in incubating fertile eggs for over 50 transfers. Tremendous numbers of rickettsiae were found in the yolk-sac. Yolk-sac suspensions are consistently more infectious than other tissues of the developing chick embryo and as a rule show infective titers ranging from 1:1 billion to 1:100 billion, or 10 to 1,000 times greater than the highest titers obtained with tissue culture preparations.

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RELAPSING FEVER: *ORNITHODOROS HERMSI* A VECTOR IN COLORADO[1]

By Gordon E. Davis, *Bacteriologist, United States Public Health Service*

The earliest known endemic focus of relapsing fever in the United States is in Colorado. In 1915, Dr. C. N. Meador[2] reported 5 cases contracted in Bear Creek Canyon, Jefferson County, in the mountains west of Denver. Spirochetes were demonstrated in the blood of 2 patients. Meador was aware of the role played by ticks in Africa, but since tick transmission was then unknown in this country, he suggested as the source of his cases a band of gypsies who stopped at the tent used by 4 of the patients. In 1917 Dr. James J. Waring reported another case from the same locality. Spirochetes were again demonstrated. Waring expressed no opinion as to the means of infection, but mentioned ticks, body lice, and bedbugs as suspected vectors in other countries. He did, however, stress the endemicity of the disease. The possible implication of biting flies had been suggested to him, but concerning this he remarked, "It is highly improbable that these flies have anything to do with the transmission of this disease." Suspicious cases from the same locality were also reported to Dr. Waring in both 1916 and 1917, but were not confirmed.

A case treated by Drs. Hagood, Downey, and Wilson, of Whittier, Calif., in 1923, is attributed to Colorado, location unknown.

No further infections were reported from this general area until 1930, when Dr. Paul J. Connor[3] treated a case originating near Estes Park. In 1937 Dr. Wilfred S. Dennis[3] reported 2 cases that became infected on Genesee Mountain west of Denver. Spirochetes were demonstrated in all 3 of these cases.

In 1938 Dr. A. T. Monismith[3] of Fort Upton advised the Rocky Mountain Laboratory of 2 cases, one in June and the other in July, occurring in northeastern Park County about 40 miles southwest of

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

[2] Dr. Meador and Drs. Waring, Connor, and Dennis mentioned below were all physicians practicing in Denver, Colo.

[3] These cases were reported in correspondence with the attending physicians.

Denver. The presence of spirochetes was not shown, but the clinical symptoms were typical. He also reported several cases as having occurred near Durango, La Plata County, in southwestern Colorado, about 20 years previously, he himself having been one of the patients.

Two cases were reported in July 1939, but have not been confirmed.

FIELD STUDIES

In the summer of 1937 an extensive search was made in the Bear Creek Canyon and the Estes Park areas for ticks of the genus *Ornithodoros*, species of which are now known to be the transmitting agents of relapsing fever in the United States. In July 1938 studies were made in the locality from which Dr. Dennis' patients became infected. Native rodents and their burrows were examined in all these localities, with negative results.

In September 1938, observations were made in the locality in which Doctor Monismith's 2 cases had originated earlier in the season. The mountain cabin which had been occupied by the patients was carefully examined. Though loosely constructed in part, there was no evidence of rodents within and no rodent signs were seen during a 2-day observation period. Subsequently, the owner of the cabin reported that a "nest" was found when removing the wall coverings. Incidentally, the cabin had been thoroughly cleaned following the illnesses, and hay-stuffed mattresses had been emptied and the contents burned. No rodents were seen locally except chipmunks (*Eutamias* sp.) around haystacks on an adjoining ranch. Several were examined but were free from ticks.

However, 51 *Ornithodoros* ticks were collected from a chipmunk's nest found in a decaying Douglas fir stump on a nearby hillside and from crevices in the rotting wood. The elevation is approximately 8,800 feet. These ticks have been identified by Entomologist R. A. Cooley as *O. hermsi* Wheeler. This is the first record of a relapsing fever spirochete-transmitting species of *Ornithodoros* in eastern Colorado. Spirochetes were not recovered from this lot. However, on June 11, 1939, 213 *hermsi* were collected from another decaying Douglas fir stump in the same locality. Two hundred and four of these were tested in 20 groups of 10 each and one group of 4 by feeding on young white rats. Spirochetes appeared in the peripheral blood of 3 rats. Progeny from these ticks also proved infective.

This tick has previously been known only in Placer, San Bernardino, and San Benito Counties, Calif., and in an area near Moscow, Idaho. The author's observation in Colorado extends its known range eastward nearly 600 miles to beyond the continental divide. This at least suggests the possibility of sporadic occurrence of this species in a considerable part of the Rocky Mountain region.

The only other record of a spirochete-carrying species of *Ornithodoros* in Colorado is that of a single nymph of *O. parkeri* from a group of 8 prairie dogs (*Cynomys* sp.) collected in August 1938, in Moffat County (northwestern Colorado) by a field crew of the Public Health Service Plague Laboratory at San Francisco. Elsewhere this species has repeatedly been found spontaneously infected with spirochetes which cause relapsing fever in laboratory animals, but thus far they have not been definitely identified with infection in man (Davis, 1939).

SUMMARY

Relapsing fever is endemic in Colorado in a northern and southern strip of high mountainous country extending from at least as far south as northern Park County to at least as far north as Estes Park in Larimer County. Spirochetes have been recovered from *Ornithodoros hermsi* recently collected in this area. This species is, without doubt, a transmitting agent locally.

There is a possible endemic area near Durango in La Plata County.

Ornithodoros parkeri, a tick known to be naturally infected with spirochetes, occurs in the sagebrush desert section of northwestern Colorado, but no human cases have been reported in that part of the State.

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DEATHS DURING WEEK ENDED NOVEMBER 18, 1939

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

	Week ended Nov. 18, 1939	Corresponding week, 1938
Data from 88 large cities of the United States:		
Total deaths	8,247	8,288
Average for 3 prior years	[1] 8,179	
Total deaths, first 46 weeks of year	378,492	372,263
Deaths under 1 year of age	506	487
Average for 3 prior years	[1] 492	
Deaths under 1 year of age, first 46 weeks of year	22,844	24,051
Data from industrial insurance companies:		
Policies in force	66,558,358	68,305,603
Number of death claims	12,092	13,082
Death claims per 1,000 policies in force, annual rate	9.5	10.0
Death claims per 1,000 policies, first 46 weeks of year, annual rate	9.9	9.2

[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 November 25, 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			
	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934-38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934-38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934-38, median
NEW ENG.												
Maine	48	8	10	1	6	1	1	------	284	47	8	26
New Hampshire	0	0	2	0	------	------	------	------	20	2	0	4
Vermont	0	0	1	1	------	------	------	------	523	39	3	3
Massachusetts	5	4	4	6	------	------	------	------	232	197	143	75
Rhode Island	8	1	1	0	------	------	------	------	412	54	1	4
Connecticut	0	0	2	2	3	1	10	4	178	60	30	55
MID. ATL.												
New York	7	17	20	30	[1] 5	[1] 7	[1] 14	[1] 14	52	129	348	348
New Jersey	19	16	6	11	14	12	6	8	13	11	8	28
Pennsylvania	21	42	45	45	------	------	------	------	12	23	62	133
E. NO. CEN.												
Ohio	13	17	46	51	7	9	------	6	12	15	18	101
Indiana	33	22	40	49	12	8	8	14	16	11	5	7
Illinois	26	39	42	64	13	20	12	12	12	18	18	22
Michigan [2]	13	12	16	18	------	------	1	1	193	183	23	37
Wisconsin	5	3	1	5	30	17	25	25	0	0	91	76
W. NO. CEN.												
Minnesota	12	6	10	7	6	3	------	1	136	70	141	41
Iowa	12	6	31	4	2	1	10	2	26	13	50	7
Missouri	21	16	22	47	------	------	14	41	36	28	5	17
North Dakota	0	0	2	2	7	1	8	8	7	1	220	8
South Dakota	45	6	8	2	------	------	1	------	15	2	42	9
Nebraska	4	1	4	7	------	------	------	------	8	2	5	3
Kansas	28	10	14	15	22	8	10	2	193	69	3	11
SO. ATL.												
Delaware	20	1	0	0	79	4	------	------	39	2	3	3
Maryland [3]	31	10	9	14	22	7	2	7	19	6	41	35
Dist. of Col.	0	0	7	8	------	------	------	------	32	4	1	1
Virginia	107	57	78	78	242	129	105	------	15	8	11	23
West Virginia	59	22	13	22	13	5	11	23	13	5	18	18

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended November 25, 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			
	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934-38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934-38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934-38, median
SO. ATL.—con.												
North Carolina [3]	137	94	59	74	4	3	1	9	276	189	132	107
South Carolina [3]	41	15	12	10	1,702	623	274	267	11	4	6	6
Georgia [3]	56	34	21	27	450	271	15	------	5	3	23	0
Florida [3]	27	9	7	12	21	7	------	2	9	3	14	10
E. SO. CEN.												
Kentucky	28	16	25	27	17	10	26	17	3	2	10	11
Tennessee [3]	41	23	18	45	101	57	27	40	32	18	8	8
Alabama [3]	60	34	38	37	319	181	48	48	18	10	21	12
Mississippi [2] [3]	51	20	21	23	------	------	------	------	------	------	------	------
W. SO. CEN.												
Arkansas	42	17	15	16	114	46	81	44	2	1	6	0
Louisiana [3]	31	13	20	24	22	9	5	5	2	1	41	8
Oklahoma	52	26	13	13	95	47	69	51	0	0	6	3
Texas [3]	46	55	54	54	276	333	209	147	72	87	3	6
MOUNTAIN												
Montana	19	2	0	2	421	45	6	3	150	16	176	19
Idaho	0	0	0	0	------	------	------	3	265	26	35	14
Wyoming	44	2	1	0	------	------	------	------	87	4	1	2
Colorado	19	4	7	9	43	9	36	------	101	21	3	5
New Mexico	49	4	1	5	12	1	------	3	25	2	3	24
Arizona	61	5	8	5	712	58	87	36	37	3	0	2
Utah [2]	0	0	11	1	219	22	7	------	447	45	12	12
PACIFIC												
Washington	12	4	2	2	------	------	------	------	891	289	48	31
Oregon	0	0	1	1	139	28	7	23	104	21	9	9
California [3]	21	25	40	42	13	16	25	33	122	149	366	148
Total	29	718	808	947	94	1,999	1,161	913	77	1,893	2,221	2,221
47 weeks	18	21,106	26,255	26,255	163	162,712	57,179	111,757	311	361,420	777,583	692,526

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934-38, median	Nov. 25, 1939, rate	Nov. 25, 1939, ases	Nov. 26, 1938, cases	1934-38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934-38, median
NEW ENG.												
Maine	0	0	0	0	0	0	0	0	133	22	13	19
New Hampshire	0	0	0	0	0	0	0	0	41	4	7	6
Vermont	0	0	0	0	13	1	0	0	40	3	9	9
Massachusetts	0	0	1	1	1.2	1	0	0	62	53	95	163
Rhode Island	0	0	0	0	0	0	0	0	23	3	7	17
Connecticut	0	0	0	0	3	1	0	0	128	43	47	45
MID. ATL.												
New York	2	5	5	5	6	14	1	4	93	233	246	334
New Jersey	1.2	1	0	0	4	3	1	0	126	106	77	77
Pennsylvania	0.5	1	2	2	4	7	7	4	111	218	210	391
E. NO. CEN.												
Ohio	0	0	2	1	1.5	2	2	1	164	213	293	293
Indiana	0	0	0	1	3	2	0	0	181	122	142	142
Illinois	0	0	1	4	2	8	0	3	206	314	274	411
Michigan [3]	1.1	1	0	2	2.1	2	0	3	242	229	274	286
Wisconsin	0	0	0	0	12	7	0	0	255	145	175	225

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended November 25, 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			
	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934–38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934–38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934–38, median
W. NO. CEN.												
Minnesota	0	0	1	1	17	9	1	2	277	143	82	102
Iowa	2	1	1	1	10	5	0	1	186	92	59	80
Missouri	1.3	1	2	2	0	0	2	2	104	81	86	112
North Dakota	0	0	0	0	7	1	0	0	212	29	23	31
South Dakota	0	0	0	0	0	0	0	0	286	38	24	26
Nebraska	0	0	0	0	23	6	0	0	80	21	20	27
Kansas	0	0	1	1	2.8	1	0	1	313	112	119	125
SO. ATL.												
Delaware	20	1	0	0	0	0	0	0	512	26	7	9
Maryland [2]	3	1	0	2	0	0	0	0	105	34	27	62
Dist. of Col	8	1	0	0	0	0	0	0	89	11	14	12
Virginia	1.9	1	2	4	4	2	0	0	148	79	42	51
West Virginia	11	4	3	2	8	3	0	0	306	114	88	104
North Carolina [3]	0	0	1	1	0	0	1	1	181	124	72	76
South Carolina [3]	0	0	2	0	2.7	1	0	0	44	16	14	6
Georgia [3]	1.7	1	1	1	0	0	1	0	61	37	27	23
Florida [3]	0	0	0	0	0	0	0	0	21	7	6	7
E. SO. CEN.												
Kentucky	0	0	3	2	3	2	0	1	167	96	94	75
Tennessee [3]	4	2	1	3	0	0	1	2	173	98	52	70
Alabama [3]	5	3	2	2	4	2	1	2	79	45	34	28
Mississippi [2, 3]	8	3	0	1	2.5	1	0	0	33	13	15	23
W. SO. CEN.												
Arkansas	2.5	1	2	0	5	2	1	1	57	23	13	13
Louisiana [3]	2.4	1	0	0	0	0	0	1	29	12	19	17
Oklahoma	0	0	1	1	2	1	0	0	54	27	27	22
Texas [3]	0.8	1	0	0	2.5	3	1	1	56	68	102	66
MOUNTAIN												
Montana	0	0	0	0	0	0	0	0	346	37	31	31
Idaho	10	1	0	0	41	4	0	0	61	6	15	24
Wyoming	0	0	0	0	0	0	0	0	87	4	3	10
Colorado	5	1	1	1	5	1	0	0	125	26	28	43
New Mexico	12	1	0	0	12	1	0	0	86	7	18	25
Arizona	0	0	1	0	0	0	0	1	98	8	5	14
Utah [2]	10	•1	0	0	30	3	0	0	109	11	18	39
PACIFIC												
Washington	0	0	0	1	6	2	0	0	49	16	45	59
Oregon	5	1	1	0	5	1	0	0	124	25	44	44
California [3]	0	0	0	4	20	24	0	11	139	169	212	212
Total	1.4	35	37	68	5	118	20	61	134	3,363	3,354	4,048
47 weeks	1.5	1,793	2,626	4,998	6	6,920	1,616	7,021	121	143,500	167,502	199,748

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended November 25, 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		
	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934–38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934–38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases
NEW ENG.											
Maine	0	0	0	0	6	1	1	1	296	49	29
New Hampshire	0	0	0	0	10	1	0	0	61	6	0
Vermont	0	0	0	0	13	1	0	1	1,046	78	50
Massachusetts	0	0	0	0	1	1	1	1	134	114	179
Rhode Island	0	0	0	0	0	0	2	0	122	16	18
Connecticut	0	0	0	0	6	2	2	2	229	77	78
MID. ATL.											
New York	0	0	0	0	3	7	10	10	134	334	578
New Jersey	0	0	0	0	4	3	2	2	138	116	273
Pennsylvania	0	0	0	0	7	14	9	15	142	279	376
E. NO. CEN.											
Ohio	0	0	2	0	2	2	2	5	75	98	189
Indiana	4	3	22	2	4	3	5	3	83	56	11
Illinois	0	0	0	1	4	6	6	11	82	125	447
Michigan [2]	3	3	3	0	3	3	6	4	115	109	213
Wisconsin	12	7	11	11	0	0	2	2	271	154	372
W. NO. CEN.											
Minnesota	41	21	8	8	0	0	1	0	140	72	23
Iowa	4	2	16	2	0	0	33	3	12	6	29
Missouri	0	0	4	4	8	6	1	13	26	20	10
North Dakota	0	0	16	16	0	0	0	0	44	6	18
South Dakota	15	2	0	6	0	0	0	0	15	2	3
Nebraska	0	0	1	0	8	2	0	0	15	4	5
Kansas	0	0	1	1	8	3	1	4	34	12	20
SO. ATL.											
Delaware	0	0	0	0	59	3	0	0	295	15	1
Maryland [2]	0	0	0	0	9	3	3	7	160	52	31
Dist. of Col	0	0	0	0	0	0	2	0	81	10	12
Virginia	0	0	0	0	17	9	3	13	37	20	13
West Virginia	0	0	0	0	11	4	5	5	35	13	34
North Carolina [3]	0	0	0	0	0	0	2	4	92	63	214
South Carolina [3]	0	0	0	0	0	0	2	2	22	8	19
Georgia [3]	0	0	1	0	15	9	3	3	13	8	5
Florida [3]	0	0	0	0	0	0	0	1	15	5	9
E. SO. CEN.											
Kentucky	0	0	2	0	7	4	15	14	71	41	9
Tennessee [3]	0	0	0	0	5	3	5	5	39	22	27
Alabama [3]	0	0	0	0	5	3	8	6	56	32	66
Mississippi [2] [3]	0	0	0	0	3	1	2	4	------	------	------
W. SO. CEN.											
Arkansas	0	0	2	2	17	7	7	4	7	3	26
Louisiana [3]	0	0	0	0	22	9	4	9	104	43	16
Oklahoma	10	5	5	0	4	2	8	11	14	7	0
Texas [3]	8	10	3	0	15	18	20	31	27	33	41
MOUNTAIN											
Montana	0	0	1	23	0	0	0	0	28	3	46
Idaho	0	0	3	1	10	1	5	2	20	2	1
Wyoming	0	0	0	2	22	1	0	0	175	8	1
Colorado	5	1	12	3	5	1	4	2	53	11	10
New Mexico	0	0	0	0	12	1	1	5	37	3	2
Arizona	0	0	4	0	12	1	2	2	184	15	2
Utah [2]	10	1	0	0	10	1	0	0	864	87	14

Cases of certain diseases reported by telegraph by State health officers for the week ended November 25, 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		
	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934–38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases	1934–38, median	Nov. 25, 1939, rate	Nov. 25, 1939, cases	Nov. 26, 1938, cases
PACIFIC											
Washington	9	3	3	24	6	2	4	2	37	12	12
Oregon	0	0	4	3	10	2	1	1	134	27	16
California [3]	2	2	3	3	12	15	4	7	86	105	123
Total	2	60	127	127	6	155	194	230	96	2,381	3,671
47 weeks	8	9,122	123,522	6,688	10	12,077	13,598	14,321	137	159,786	190,807

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Typhus fever, week ended Nov. 25, 1939, 53 cases as follows: North Carolina, 1; South Carolina, 5; Georgia, 21; Florida, 1; Tennessee, 2; Alabama, 10; Mississippi, 1; Louisiana, 3; Texas, 7; California, 2.

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
September 1939										
Puerto Rico	25	17	1,300	45	0	4	0	0	0	31
October 1939										
District of Columbia	40	1		3	1		2	39	0	5
Florida	24	7	50	24	5	7	2	22	0	6
Georgia	229	130	344	12	3	17	8	147	0	45
Hawaii Territory	6	3		2	0		5	2	0	4
Illinois	112	23	37	64	8	1	28	683	2	86
Kansas	23	24	2	156	3	1	10	308	2	20
Louisiana	85	34	37	5	1	9	1	37	0	39
Mississippi	83	2,994	4,727	77	1	303	2	53	0	9
Montana	39	20		152	0		1	110	0	11
Ohio	157	50	1	71	2		33	762	3	49
Oklahoma	42	156	179	9	3	12	11	58	5	50
Rhode Island	1			72	1		0	13	0	6
Washington	9	6		970	8		5	147	3	18

Summary of monthly reports from States—Continued

September 1939

	Cases
Puerto Rico:	
Chickenpox	2
Dysentery	14
Leprosy	3
Mumps	1
Ophthalmia neonatorum	1
Puerperal septicemia	5
Tetanus	13
Tetanus, infantile	13
Whooping cough	59

October 1939

	Cases
Actinomycosis:	
Illinois	2
Chickenpox:	
District of Columbia	39
Florida	9
Georgia	15
Hawaii Territory	26
Illinois	450
Kansas	147
Louisiana	2
Mississippi	168
Montana	129
Ohio	586
Oklahoma	9
Rhode Island	25
Washington	345
Conjunctivitis, infectious:	
Georgia	26
Hawaii Territory	51
Dengue:	
Florida	1
Georgia	5
Diarrhea:	
Ohio (under 2 years; enteritis included)	54
Dysentery:	
Georgia (amoebic)	11
Georgia (bacillary)	9
Georgia (unspecified)	3
Hawaii Territory (amoebic)	5
Illinois (amoebic)	8
Illinois (amoebic carriers)	14
Illinois (bacillary)	29
Kansas (amoebic)	1
Kansas (bacillary)	3
Louisiana (amoebic)	12
Louisiana (bacillary)	1
Mississippi (amoebic)	149
Mississippi (bacillary)	348
Ohio (amoebic)	1
Ohio (bacillary)	17
Oklahoma (amoebic)	2
Oklahoma (bacillary)	44
Rhode Island (bacillary)	8
Washington (bacillary)	3
Encephalitis, epidemic or lethargic:	
Florida	1
Illinois	7
Kansas	14
Montana	1
Ohio	6
Oklahoma	1
Washington	3

October 1939—Continued

	Cases
Favus:	
Georgia	3
Food poisoning:	
Illinois	5
German measles:	
Hawaii Territory	6
Illinois	26
Kansas	2
Ohio	13
Rhode Island	2
Washington	16
Hookworm disease:	
Florida	29
Georgia	2, 503
Hawaii Territory	3
Louisiana	13
Mississippi	604
Impetigo contagiosa:	
Hawaii Territory	34
Illinois	20
Kansas	7
Montana	10
Ohio	57
Oklahoma	10
Washington	4
Jaundice, acute epidemic:	
Hawaii Territory	1
Lead poisoning:	
Ohio	5
Leprosy:	
Hawaii Territory	2
Mumps:	
Florida	9
Georgia	46
Hawaii Territory	33
Illinois	94
Kansas	62
Louisiana	1
Mississippi	150
Montana	49
Ohio	232
Oklahoma	11
Rhode Island	101
Washington	28
Ophthalmia neonatorum:	
Illinois	4
Florida	1
Mississippi	11
Puerperal septicemia:	
Mississippi	26
Ohio	1
Rabies in animals:	
Florida	3
Illinois	20
Louisiana	10
Mississippi	3
Oklahoma	22
Rhode Island	4
Washington	13
Rabies in man:	
Ohio	1
Relapsing fever:	
Kansas	1
Rocky Mountain spotted fever:	
Washington	1
Scabies:	
Kansas	11
Montana	6
Washington	7

October 1939—Continued

	Cases
Screw worm infection:	
Georgia	1
Septic sore throat:	
Florida	3
Georgia	48
Illinois	4
Kansas	11
Louisiana	7
Montana	2
Ohio	12
Oklahoma	28
Rhode Island	11
Washington	5
Tetanus:	
Florida	2
Georgia	1
Hawaii Territory	2
Illinois	5
Louisiana	7
Ohio	2
Trachoma:	
Florida	1
Illinois	40
Kansas	1
Mississippi	11
Ohio	8
Oklahoma	79
Trichinosis:	
Illinois	1
Tularaemia:	
Georgia	1
Illinois	10
Kansas	5
Louisiana	3
Typhus fever:	
Florida	7
Georgia	115
Hawaii Territory	7
Louisiana	15
Mississippi	6
Undulant fever:	
District of Columbia	2
Florida	7
Georgia	3
Illinois	17
Kansas	5
Louisiana	3
Mississippi	1
Ohio	7
Oklahoma	21
Rhode Island	3
Washington	1
Vincent's infection:	
Florida	16
Illinois	34
Kansas	11
Oklahoma	10
Whooping cough:	
District of Columbia	61
Florida	8
Georgia	59
Hawaii Territory	176
Illinois	744
Kansas	24
Louisiana	106
Mississippi	604
Montana	15
Ohio	624
Oklahoma	2
Rhode Island	75
Washington	46

CASES OF VENEREAL DISEASES REPORTED FOR SEPTEMBER 1939

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	1,399	4.83	397	1.37
Arizona	188	4.56	97	2.35
Arkansas	821	4.01	144	.70
California	1,738	2.82	1,467	2.38
Colorado	93	.87	78	.73
Connecticut	168	.96	103	.59
Delaware	203	7.78	56	2.15
District of Columbia	426	6.79	302	4.82
Florida	2,485	14.88	180	1.08
Georgia	2,094	6.79	41	.13
Idaho	30	.61	20	.41
Illinois	2,071	2.63	1,563	1.98
Indiana	559	1.61	109	.31
Iowa	281	1.10	135	.53
Kansas	207	1.11	132	.71
Kentucky	585	2.00	287	.98
Louisiana	892	4.18	89	.42
Maine	36	.42	53	.62
Maryland	934	5.56	325	1.94
Massachusetts	335	.76	419	.95
Michigan	1,076	2.23	680	1.41
Minnesota	236	.89	175	.66
Mississippi	2,272	11.23	2,521	12.46
Missouri	633	1.59	235	.59
Montana	37	.69	19	.35
Nebraska	62	.45	73	.54
Nevada	50	4.95	8	.79
New Hampshire	22	.43	15	.29
New Jersey	979	2.25	302	.70
New Mexico	142	3.36	46	1.09
New York	3,597	2.78	1,602	1.24
North Carolina	2,669	7.64	413	1.18
North Dakota	27	.38	47	.67
Ohio	1,200	1.78	523	.78
Oklahoma	847	3.32	356	1.40
Oregon	89	.87	136	1.32
Pennsylvania	1,257	1.24	142	.14
Rhode Island	131	1.92	76	1.12
South Carolina	1,338	7.14	310	1.65
South Dakota	24	.35	17	.25
Tennessee	1,241	4.29	617	2.13
Texas	4,222	6.84	1,056	1.71
Utah	17	.33	36	.69
Vermont	13	.34	24	.63
Virginia	1,748	6.46	351	1.30
Washington	172	1.04	276	1.66
West Virginia	284	1.52	143	.77
Wisconsin	53	.18	141	.48
Wyoming	18	.77	19	.81
Hawaii	50	1.23	41	1.01
Virgin Islands	43	19.55	23	10.45
Total	40,124	3.09	16,420	1.27

Reports from cities of 200,000 population or over [1]

Akron, Ohio	29	1.05	28	1.02
Atlanta, Ga	378	12.59	108	3.60
Baltimore, Md	569	10.41	214	2.56
Birmingham, Ala	235	7.98	50	1.70
Boston, Mass	121	1.52	127	1.60
Buffalo, N. Y	181	3.01	55	.91
Chicago, Ill	1,242	3.39	1,008	2.75
Cincinnati, Ohio	157	3.32	124	2.62

[1] No reports received from Kansas City, Mo., Los Angeles, Calif., Milwaukee, Wis., Newark, N. J., New Orleans, La., St. Louis, Mo., San Antonio, Tex., or Toledo, Ohio.

Reports from cities of 200,000 population or over—Continued

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Cleveland, Ohio	269	2.85	102	1.08
Columbus, Ohio	73	2.33	39	1.24
Dallas, Tex	197	6.48	125	4.11
Dayton, Ohio	79	3.56	38	1.71
Denver, Colo	59	1.96	46	1.53
Detroit, Mich	556	3.06	341	1.88
Houston, Tex	308	8.59	118	3.29
Indianapolis, Ind	12	.31	34	.88
Jersey City, N. J	44	1.36	16	.49
Louisville, Ky	183	5.40	70	2.07
Memphis, Tenn	281	9.62	197	6.75
Minneapolis, Minn	48	.96	36	.72
New York, N. Y	2,461	4.00	1,166	1.56
Oakland, Calif	67	2.14	35	1.12
Omaha, Nebr	25	1.12	31	1.39
Philadelphia, Pa	538	2.68	-------	-------
Pittsburgh, Pa	256	3.63	19	.27
Portland, Oreg	87	2.71	94	2.93
Providence, R. I	85	3.27	45	1.73
Rochester, N. Y	24	.70	38	1.11
St. Paul, Minn	29	1.01	27	.94
San Francisco, Calif	104	1.51	146	2.12
Seattle, Wash	76	1.96	90	2.32
Syracuse, N. Y	69	3.06	7	.31
Washington, D. C	426	6.79	302	4.82

WEEKLY REPORTS FROM CITIES

City reports for week ended Nov. 18, 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	236	124	36	607	518	1,110	7	334	34	1,050	-------
Current week [1]	158	134	20	511	416	790	1	307	28	753	-------
Maine:											
Portland	0	-------	0	14	0	3	0	2	0	3	23
New Hampshire:											
Concord	0	-------	0	3	0	0	0	0	0	0	13
Manchester	0	-------	1	0	0	0	0	0	0	0	19
Nashua	0	-------	0	0	0	0	0	0	0	0	4
Vermont:											
Barre	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Burlington	0	-------	0	0	0	0	0	0	0	8	11
Rutland	0	-------	0	0	1	0	0	0	0	0	5
Massachusetts:											
Boston	2	-------	0	23	15	19	0	5	0	19	197
Fall River	1	-------	0	0	4	0	0	3	0	11	34
Springfield	0	-------	0	0	2	0	1	2	0	7	35
Worcester	0	-------	0	4	6	5	0	0	1	5	36
Rhode Island:											
Pawtucket	0	-------	0	0	0	1	0	0	0	1	21
Providence	0	-------	0	58	2	2	0	1	0	18	55
Connecticut:											
Bridgeport	0	-------	0	0	0	2	0	0	1	1	40
Hartford	0	-------	0	0	2	3	0	0	0	28	40
NewHaven	0	-------	0	6	1	6	0	0	0	2	41
New York:											
Buffalo	1	-------	0	3	9	6	0	4	0	4	136
New York	18	11	1	13	61	70	0	84	1	89	1,441
Rochester	0	-------	0	4	3	2	0	1	0	5	53
Syracuse	0	-------	0	0	4	3	0	0	0	21	50

[1] Figures for Barre estimated; report not received.

City reports for week ended Nov. 18, 1939—Continued

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								
New Jersey:											
Camden	4		0	0	0	2	0	1	0	0	27
Newark	0	2	0	3	5	15	0	6	2	20	117
Trenton	0		0	0	2	0	0	2	0	1	27
Pennsylvania:											
Philadelphia	5	2	0	4	23	20	0	23	1	92	462
Pittsburgh	2	1	3	2	13	18	0	7	0	13	160
Reading	0		0	1	1	1	0	0	0	0	19
Scranton	0			0		1	0		0	3	
Ohio:											
Cincinnati	10		0	1	4	14	0	9	0	4	145
Cleveland	3	20	2	3	20	42	0	10	0	35	205
Columbus	7	1	1	2	4	5	0	1	0	2	78
Toledo	0		0	7	0	14	0	3	0	15	69
Indiana:											
Anderson	0		0	0	1	2	1	0	0	7	7
Fort Wayne	0		0	0	0	5	0	0	0	0	27
Indianapolis	5		0	6	7	18	0	5	1	13	96
Muncie	0		0	1	0	3	0	0	0	0	10
South Bend	0		0	2	1	1	0	0	0	5	15
Terre Haute	1		0	0	1	1	0	0	0	0	21
Illinois:											
Alton	0		0	0	3	0	0	0	0	0	10
Chicago	21	8	0	8	25	134	0	37	1	55	679
Elgin	0		0	0	1	1	0	1	0	5	6
Moline	0		0	0	0	2	0	0	0	1	7
Springfield	0		0	0	9	0	0	0	0	5	36
Michigan:											
Detroit	6		0	9	11	59	0	8	0	28	211
Flint	0		0	1	2	5	0	2	0	15	28
Grand Rapids	0		0	3	0	18	0	1	0	2	32
Wisconsin:											
Kenosha	0		0	1	0	1	0	0	0	4	12
Madison	0		0	0	2	0	0	0	0	11	18
Milwaukee	0	1	1	2	3	45	0	0	0	18	83
Racine	0		0	3	0	1	0	0	0	2	11
Superior	0		0	0	0	3	0	0	0	0	5
Minnesota:											
Duluth	0		0	39	0	4	0	0	0	0	20
Minneapolis	0		0	2	5	27	0	1	0	7	95
St. Paul	0		0	2	8	11	0	2	0	27	59
Iowa:											
Cedar Rapids	0			0		0	0		0	0	
Davenport	3			0		7	0		0	0	
Des Moines	0		0	1	0	16	0	0	0	1	36
Sioux City	0			0		8	0		0	0	
Waterloo	1			2		5	0		0	1	
Missouri:											
Kansas City	0		1	0	4	9	0	4	0	1	93
St. Joseph	0		0	0	1	2	0	0	1	0	16
St. Louis	11		0	3	7	16	0	2	0	10	187
North Dakota:											
Fargo	0		0	0	3	3	0	0	0	1	9
Grand Forks	0			1		0	0		0	1	
Minot	1		0	0	0	2	0	0	0	0	8
South Dakota:											
Aberdeen	0			0		3	0		0	0	
Sioux Falls	0		0	0	0	12	0	0	0	0	9
Nebraska:											
Lincoln	0			0		1	0		0	3	
Omaha	0		0	1	7	3	0	0	0	2	63
Kansas:											
Lawrence	0		0	0	0	0	0	0	0	0	7
Topeka	0		0	2	2	7	0	1	0	0	29
Wichita	2		1	41	8	0	0	0	1	0	37
Delaware:											
Wilmington	1		0	0	3	1	0	0	0	7	35
Maryland:											
Baltimore	2	5	1	1	12	8	0	8	0	44	206
Cumberland	0		0	1	0	6	0	0	0	0	11
Frederick	1		0	0	2	3	0	0	0	0	2
Dist. of Col.:											
Washington	2		0	1	3	6	0	11	2	11	160
Virginia:											
Lynchburg	2		0	0	0	2	0	0	1	4	12
Norfolk	0		0	1	0	2	0	0	0	0	16
Richmond	5		2	4	5	6	0	1	0	2	62
Roanoke	0		0	0	0	1	0	0	0	5	14

City reports for week ended Nov. 18, 1939—Continued

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								
West Virginia:											
Charleston	2	1	0	0	0	4	0	1	1	0	10
Huntington	0			0		0	0		0	0	
Wheeling	1		0	0	0	0	0	1	0	0	25
North Carolina:											
Gastonia	1			0		0	0		0	0	
Raleigh	0		0	1	3	2	0	0	0	0	22
Wilmington	2		0	0	0	0	0	1	0	0	17
Winston-Salem	2		0	0	2	4	0	0	0	0	23
South Carolina:											
Charleston	0	23	0	0	2	0	0	0	2	0	16
Florence	0	7	0	1	4	1	0	0	0	0	15
Greenville	0		1	0	1	0	0	0	0	0	19
Georgia:											
Atlanta	2	6	1	0	6	11	0	6	1	0	108
Brunswick	0		0	0	1	1	0	0	0	0	5
Savannah	3	9	0	0	1	3	0	0	0	2	26
Florida:											
Miami	0	1	0	0	3	1	0	1	0	1	35
Tampa	0		0	0	0	0	0	1	0	0	23
Kentucky:											
Ashland	0	2	0	0	2	1	0	0	0	0	8
Covington	0		0	0	1	2	0	2	0	0	11
Lexington	0		0	0	2	2	0	1	0	0	12
Louisville	0	1	0	1	4	17	0	3	0	24	85
Tennessee:											
Knoxville	1	1	0	0	3	11	0	0	0	0	18
Memphis	0	1	0	1	2	5	0	6	0	17	64
Nashville	3		0	0	3	2	0	2	0	8	43
Alabama:											
Birmingham	5	14	0	1	4	5	0	4	0	0	78
Mobile	2	1	0	0	2	8	0	0	0	0	15
Arkansas:											
Fort Smith	0	1		0		1	0		0	0	
Little Rock	0	1	0	0	3	1	0	1	0	0	
Louisiana:											
Lake Charles	0		0	0	0	2	0	0	0	0	3
New Orleans	2	1	0	1	17	5	0	8	2	1	172
Shreveport	2		0	1	3	2	0	0	0	0	31
Oklahoma:											
Oklahoma City	0	4	0	3	2	4	0	2	0	0	43
Tulsa	0			0		3	0		0	0	
Texas:											
Dallas	1	2	2	0	5	5	0	1	0	2	58
Galveston	0		0	0	1	0	0	1	0	0	17
Houston	10		0	0	11	6	0	6	0	1	81
San Antonio	1	2	1	13	1	0	0	7	2	0	59
Montana:											
Billings	0		1	0	2	0	0	1	0	0	9
Great Falls	0		0	1	1	2	0	0	0	0	11
Helena	0	1	1	0	0	0	0	0	0	0	6
Missoula	0		0	0	1	0	0	0	0	2	3
Idaho:											
Boise	0		0	0	1	0	0	0	0	0	7
Colorado:											
Colorado Springs	0		1	1	2	3	0	3	0	4	16
Denver	3		0	4	8	7	0	3	1	4	96
Pueblo	0		0	0	1	1	0	1	1	0	11
New Mexico:											
Albuquerque	0		0	1	0	1	0	1	0	4	6
Utah:											
Salt Lake City	0		0	21	3	7	0	2	0	35	36
Washington:											
Seattle	0		0	11	3	1	0	4	0	2	103
Spokane	0	1	1	3	1	6	0	0	1	0	32
Tacoma	0		0	167	1	2	0	0	0	0	24
Oregon:											
Portland	1		1	2	3	4	0	1	0	3	86
Salem	0			3		0	0		0	0	
California:											
Los Angeles	1	13	0	8	7	45	0	0	4	14	355
Sacramento	0		0	0	3	2	0	0	0	0	34
San Francisco	4		0	1	8	8	0	6	0	17	160

City reports for week ended Nov. 18, 1939—Continued

State and city	Meningitis, meningococcus		Polio-mye-litis cases	State and city	Meningitis, meningococcus		Polio-mye-litis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				North Dakota:			
Worcester	0	0	1	Fargo	0	0	1
New York:				Maryland:			
Buffalo	0	0	2	Baltimore	0	0	2
New York	0	0	3	District of Columbia:			
Rochester	0	0	1	Washington	0	0	3
Pennsylvania:				West Virginia:			
Philadelphia	0	0	2	Wheeling	1	0	0
Ohio:				Alabama:			
Cincinnati	0	0	2	Mobile	0	1	1
Cleveland	0	0	1	Arkansas:			
Indiana:				Little Rock	0	0	2
Indianapolis	0	0	1	Louisiana:			
Illinois:				New Orleans	1	1	0
Chicago	0	0	1	Colorado:			
Michigan:				Denver	0	0	2
Detroit	0	0	2	Pueblo	0	0	3
Wisconsin:				Utah:			
Milwaukee	0	0	1	Salt Lake City	0	0	3
Minnesota:				California:			
Minneapolis	0	0	1	Los Angeles	0	0	2
St. Paul	0	0	1	Sacramento	0	0	1
Iowa:				San Francisco	1	0	2
Des Moines	0	0	7				

Pellagra.—Cases: Philadelphia, 1; Lynchburg, 1; Savannah, 1; Louisville, 1.

Typhus fever.—Cases: New York, 3; Charleston, S. C., 2; Atlanta, 6; Savannah, 1; Tampa, 2; Mobile, 1; Dallas, 1; Los Angeles, 2.

FOREIGN REPORTS

BRAZIL

Rio de Janeiro—Poliomyelitis.—According to a report dated November 6, 1939, an epidemic of poliomyelitis was present in Rio de Janeiro, Brazil, where a total of 89 cases with 5 deaths occurred during the first 4 weeks of October, as follows:

Week ended—	*Cases*	*Deaths*
Oct. 7	9	0
Oct. 14	6	1
Oct. 21	39	2
Oct. 28	35	2

CANADA

Provinces—Communicable diseases—Week ended November 11, 1939.—During the week ended November 11, 1939, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					5					5
Chickenpox		12	2	142	281	36	53	51	50	627
Diphtheria		3	3	60	1	6				73
Dysentery					3				1	4
Influenza		48			13	2			3	66
Measles		7		154	251	17	31	2	42	504
Mumps				65	68	4	6		3	146
Pneumonia		7			34	2			7	50
Poliomyelitis				3	5					8
Scarlet fever	12	21	14	88	152	21	15	14	19	356
Trachoma						6				6
Tuberculosis	1	9	5	32	37	26		2		112
Typhoid and paratyphoid fever				23	2	1	1	2	1	30
Whooping cough		27		45	54	28	8	14	4	180

IRAQ

Anthrax.—According to a report dated November 22, 1939, 11 cases of human anthrax were reported in Iraq during the first 3 weeks of October 1939.

ITALY

Communicable diseases—4 weeks ended August 13, 1939.—During the 4 weeks ended August 13, 1939, cases of certain communicable diseases were reported in Italy as follows:

Disease	July 17–23	July 24–30	July 31–Aug. 6	Aug. 7–13
Anthrax	29	25	32	37
Cerebrospinal meningitis	19	14	15	17
Chickenpox	244	226	133	101
Diphtheria	396	377	428	415
Dysentery (amoebic)	44	31	29	15
Dysentery (bacillary)	5	9	24	49
Hookworm disease	10	23	23	24
Lethargic encephalitis		1	2	1
Measles	839	692	519	459
Mumps	155	135	105	108
Paratyphoid fever	81	112	177	148
Pellagra	11	13	6	11
Poliomyelitis	259	208	221	202
Puerperal fever	25	27	20	22
Rabies	1			
Scarlet fever	169	170	196	169
Typhoid fever	595	677	793	867
Undulant fever	113	92	102	82
Whooping cough	615	607	567	471

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 November 24, 1939, pages 2106–2119. A similar cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

Cholera

China—Tientsin.—A report dated November 10, 1939, states that since September 27, 1939, 33 cases of cholera with 14 deaths had been reported in Tientsin, China.

Plague

Hawaii Territory—Island of Hawaii—Hamakua District—Hamakua Mill area.—A rat found on October 31, 1939, in Hamakua Mill area, about 2 miles from Paauilo village, Hamakua District, Island of Hawaii, T. H., has been proved positive for plague.

Peru.—During the month of September 1939, plague has been reported in the following Departments of Peru: Cajamarca, 4 cases, 1 death; Libertad, 1 case, 1 death; Lima, 1 case, 1 death; Piura, 5 cases.

Smallpox

Venezuela.—For the period October 16–31, 1939, smallpox (alastrim) was reported in Venezuela as follows: Caracas, 4 cases; Puerto Cabello, 5 cases.

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