Public Health Reports

Vol. 56 • OCTOBER 31, 1941 • *No. 44*

AN EPIDEMIOLOGICAL STUDY OF CALCIFIED PULMONARY LESIONS IN AN OHIO COUNTY[1]

By B. J. OLSON, *Passed Assistant Surgeon*, W. H. WRIGHT, *Chief of Division of Zoology*, and M. O. NOLAN, *Associate Zoologist, United States Public Health Service*

A high prevalence of pulmonary calcification has been found in certain areas of the United States. This phenomenon has been shown by Gass et al. (*1*) and Lumsden and Dearing (*2*) to be particularly common in, or adjacent to, the Appalachian Plateau. The usual interpretation of the finding of pulmonary calcification has been to consider it evidence of primary or first infection tuberculosis, although the above-mentioned workers have shown that approximately half of the young individuals with pulmonary calcification are tuberculin-negative. This observation has aroused considerable interest and some controversy in the attempt to reconcile the lack of tuberculin-positiveness in a large number of young persons with pulmonary calcification. When it is considered that these same investigators found a prevalence of pulmonary calcification up to 50 percent in the population groups studied, the seriousness of their findings should not be underestimated from a public health standpoint if it is correct to assume that a finding of pulmonary calcification is evidence of tuberculous infection.

A remarkable geographic variation in the occurrence of pulmonary calcification in school children was shown by Lumsden and Dearing (*2*) in a study of selected areas of five States. Great differences in the prevalence of pulmonary calcification were shown to exist between States. Differences of similar magnitude occurred in closely adjacent counties of a State. It was observed that this geographic distribution in pulmonary calcification was associated closely with the occurrence of limestone and chert formations.

The recent observations of Dearing et al. (*3*) in a study in Tennessee and Alabama of attack rates from tuberculosis in persons living in a

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

household with a sputum-positive case of tuberculosis revealed the following occurrence of pulmonary calcification in individuals without apparent tuberculous infiltration:

Household associates of sputum-positive cases

State	Total number X-rayed	Number with pulmonary calcification	Percent with pulmonary calcification
Tennessee	156	98	62.8
Alabama	153	16	10.5

It is obvious from this table that there is not a uniform prevalence of pulmonary calcification in household associates of sputum positive cases of tuberculosis in the two areas studied.

The above-mentioned studies demonstrate the occurrence of pulmonary calcification in many individuals who are tuberculin-negative, show a marked geographic variation of pulmonary calcification, and demonstrate the lack of a uniform occurrence of pulmonary calcification in household associates of sputum-positive cases of tuberculosis in two areas studied. These findings suggested the desirability of studying pulmonary calcification as a distinct problem.

The purpose of our study was to attempt to determine the relationship between the presence of pulmonary calcification and exposure to tuberculosis, ascariasis, and other specific diseases. Particular study of the relationship of *Ascaris* infection to pulmonary calcification seemed indicated from the results of our preliminary surveys in Giles County, Tenn., during the fall of 1939.

SELECTION OF STUDY AREA

An area most desirable for study would be one located in, or adjacent to, the Appalachian Plateau, i. e., an area in which pulmonary calcification was of common occurrence, where tuberculosis mortality was not unusually high, where the geology was known, and the families rural in order to evaluate more reliably household exposure. Ross County, Ohio, seemed to fulfill the basic requisites for study.

Ross County, located in south central Ohio, includes within its limits the junction of the Allegheny Plateau of the Appalachian Highlands and the eastern extension of the Till Plains of the Central Lowlands (*4*). In 1940 it had a population of 52,147 of which 20,129 were urban and 32,018 were rural. The county seat, Chillicothe, is located in the center of the county. The local health department is a combined city and county unit. The average annual death rate from tuberculosis for the 14-year period 1926–39 was 46.3 per 100,000. The death rate for 1939 was 24.6 per 100,000. In the calculation of these rates there were excluded the populations of one intercounty

and two Federal institutions located within the county, and the deaths from tuberculosis of nonresidents of the county occurring in these institutions.

The occurrence of pulmonary calcification in parts of Ross County was studied by Lumsden and Dearing (*2*) by an X-ray survey of three county schools. One, the Clarksburg school, was located in the north-central part of the county, and two, the Londonderry and Harrison schools, were in the southeastern part of the county. The school children came from rural areas with the exception of some pupils in the Clarksburg school who lived in the village of Clarksburg (total population, 1940 Census, 390). All pupils in the schools whose parents signed consent slips were X-rayed. No tuberculin tests were made prior to the X-ray examinations. The results of this survey are given in table 1.

TABLE 1.—*Prevalence of pulmonary calcification, demonstrated by X-ray, in school children 5–19 years of age in 3 schools of Ross County, Ohio* [1]

[From original data of Lumsden and Dearing, 1939]

School	Race	Number examined	Pulmonary calcification	
			Present	Absent
Clarksburg	White	294	91	203
	Colored	18	5	13
Harrison and Londonderry	White	191	38	153
Total	White	485	129	356
	Colored	18	5	13

[1] Nine of the 485 white children reported in this survey had additional X-ray findings as follows: Slight widening of cardiac shadow (2 cases); fine granular lesions not diagnostic (2 cases); odd shadow below diaphragm (1 case); old rib resection (1 case); circumscribed homogeneous shadow in right hilum (1 case); azygous lobe (1 case); and chest deformity (1 case).

These tabulations show that 91, or 30.9 percent, of the 294 white children in the Clarksburg school and 38, or 19.9 percent, of the 191 white children in the Harrison-Londonderry schools had pulmonary calcification. Of the 485 white children examined, 129, or 26.6 percent, had demonstrable pulmonary calcification. The difference of 11 percent in the prevalence of pulmonary calcification between the children of the Clarksburg school and the Harrison-Londonderry schools is statistically significant.[2]

PROCEDURE

The index person in the following study was a pupil found to have a pulmonary calcification in the survey of Lumsden and Dearing (*2*). Nothing further was known about the index person or his or her family.

[2] The evaluation of this difference in the prevalence of calcification will be the subject of a later paper in which the duration of residence in various areas of the county is considered in relation to the local geology.

Only rural households living on farms were studied. This selection was made to rule out as far as possible extra-household contact with tuberculosis. All households were visited in turn, the purpose and procedures of the study explained in detail, and cooperation requested. Sixty-eight households were requested to cooperate in the study, which began in the middle of July and ended December 8, 1940. Of these 68 households, 46, or 67 percent, agreed to cooperate and 22, or 33 percent, refused. The reasons for refusals varied.[3] In no instance did a refusal appear to be based on a prior knowledge of known tuberculosis in the family. Two of the 46 families did not keep their appointments for X-ray and were dropped from the study.

It was interesting that most of the families visited had not been under recent care of a physician, nor, in the past, had they been served by the health department except in regard to quarantine in the common communicable diseases.

All households were seen and studied by one of the authors (B.J.O.). The schedule which was developed and used was based on the technique described by Frost (*5*) for household studies. The date of establishment of the households in this study was the date of marriage of the parents of the index person. Particular attention was paid to the occurrence of tuberculosis in each household member.

The family history included an enumeration of the uncles, aunts, and grandparents of the index person. It was ascertained whether these individuals were living or dead at the time of the study, and whether any member had a history of tuberculosis.

Household members present at the time of study were X-rayed when possible, regardless of their medical history with respect to tuberculosis or other pulmonary disease. All X-rays were taken by Dr. R. Holmes, consultant of the United States Public Health Service at Chillicothe, Ohio. With the exception of small babies, all X-rays were taken at a distance of 6 feet on standard 14 x 17 or 10 x 12 films. Inasmuch as most families had to drive 10 to 35 miles for these X-rays, their cooperation was noteworthy. The final readings of all films were made by Dr. R. A. Brown, supervisor of the tuberculosis control section, Division of Preventive Medicine, Louisiana State Department of Health, New Orleans.

With few exceptions, each present household member was tuberculin tested. An intradermal tuberculin test was done, using a preparation of PPD; except in two households, the same preparation and lot num-

[3] The word tuberculosis was not used in our request for consent to study the household. On the other hand, certain of the families did agree to cooperate after they learned that each member would have a chest X-ray, stating that they were glad of an opportunity to be X-rayed because they had suspected possible chest disease in themselves or some other member of the household. The acceptances or refusals were not limited to any particular economic or social group except for two colored households, both of which refused consent to be studied. No other colored families were approached.

ber was used in the entire study. Tests were read after 48 hours, and, with few exceptions, were made and read by one of us (B.J.O.).

A stool sample was obtained from each member and sent to the Division of Zoology, National Institute of Health, for study. Soil samples were collected from selected areas adjacent to the dwelling.

The investigation in Ross County is divided into two parts:

1. A study of the relationship of pulmonary calcification to exposure to tuberculosis.

2. A study of the relationship of other possible causes, chiefly ascariasis, to pulmonary calcification.

RESULTS

Twenty of the 44 households lived in the southeastern section of the county (Harrison school area), and 24 lived in the north-central area (Clarksburg school). The average size of the households was 9.1 persons, including all present and past members. A total of 101, or 25.1 percent of the individuals, had left the household alive prior to the investigation. In only 3 of the 44 households had more than 50 percent of the total members left prior to the time of the study. In 20 of the households between 25 and 50 percent of the members had left, and in the remaining 21 less than 25 percent of the members had left prior to the investigation. In the latter group it was interesting to note that of 98 persons in 15 households, only 7 had left the household before the study began.

It is seen from table 2 that the sexes are almost equally divided among the 279 present household members. The variations in the proportion of males and females in the various age groups are not considered significant owing to the small numbers involved. The number of males and females leaving the household alive is approximately the same, as is also the age at which they left the household.

TABLE 2.—*Age and sex distribution of all present and past members of households*

Age group	Present members			Past members						Grand total
				Living when left household			Deaths in household			
	Total	Male	Female	Total	Male	Female	Total	Male	Female	
Under 5	27	12	15	3	2	1	[1] 16	11	5	46
5–9	40	23	17	1	1	0	1	1	0	42
10–14	62	27	35	1	0	1	0	0	0	63
15–19	43	27	16	11	2	9	0	0	0	54
20–34	36	15	21	48	24	24	1	1	0	85
35–54	61	31	30	23	14	9	0	0	0	84
55 and over	10	9	1	14	7	7	4	2	2	28
Total	279	144	135	101	50	51	22	15	7	402

[1] Age group 6 months and under—total 12; 9 male, 3 female.

A total of 22 deaths occurred, 16, or 73 percent, in children under 4 years of age. Twelve were in infants 6 months of age or under, which represents 55 percent of all deaths in the households. None of the deaths were believed to have been due to tuberculosis. The causes were given as follows: 6 months and under—4 deaths from unknown cause (the ages at death were 1 day, 2 days, 1 month, and 4 months); pneumonia, 2; malnutrition, 3; pyloric stenosis, 1; cholera infantum, 1; and pertussis, 1; over 6 months—pyloric stenosis, 1; convulsions, 1; post operative, 1; diphtheria, 1; apoplexy, 2; asthma, 1; old age, 1; rheumatic fever, 1; auto accident, 1.

The age distribution among individuals dying from all causes in the households does not resemble the age distribution among persons dying from tuberculosis in the United States. The high proportion of infant deaths is not unusual.

X-ray examination of present members.—Information concerning the presence or absence of tuberculosis in the households under study was obtained by the X-ray examination of the present household members. The results are given in table 3.

TABLE 3.—*Summary of X-ray examinations of present household members*

	Number	Percent
Total members present at time of investigation	279	
Number X-rayed	256	91.7
Number not X-rayed	23	8.2
Poor films	3	1.1
Total number effectively X-rayed	253	90.7
Number effectively X-rayed showing calcified pulmonary lesion	125	49.4
Number effectively X-rayed not showing calcified pulmonary lesion	128	50.6
Total number of significant tuberculous lesions	0	0.0
Total number of other X-ray findings	8	3.2

From this table it is seen that 90.7 percent of the present household members were effectively X-rayed. There was no X-ray evidence of a significant tuberculous lesion in any of these persons. A total of 125, or 49.4 percent, had demonstrable pulmonary calcification. X-ray findings other than pulmonary calcification were present in 8 members, as follows: Irregular diaphragm, 1; interlobar pleural line, 1; irregular pleural cap, 1; pneumoconiosis, 1; cardiovascular lesion, 2; pneumonitis which had disappeared on recheck, 1; and cervical rib, 1.

The age distribution of the persons showing pulmonary calcification is given in table 4. It is seen from this table that over half of the individuals with such calcification were under 20 years of age.

Tuberculin tests.—The recent study by Furcolow et al. (*6*) has re-emphasized the close correlation between a positive reaction to tuberculin and contact with tuberculosis. These workers found that tests with 0.0001 milligram of PPD gave 95.6 percent positive reactions in

institutionalized individuals classified either as having active tuberculosis or as being in contact with active tuberculosis. The dose of PPD used in our study was one-tenth of the second strength dose (0.0005 milligram) or five times the dose used by Furcolow et al.

TABLE 4.—*Occurrence of pulmonary calcification, by age, in 253 household associates*

Age group	Total number X-rayed	Pulmonary calcification			
		Present		Absent	
		Number	Percent	Number	Percent
Under 10	63	9	14.3	54	85.7
10–19	97	59	60.8	38	39.2
20–34	28	16	57.1	12	42.9
35–54	57	35	61.4	22	38.6
55 and over	8	6	75.0	2	25.0
Total	253	125	49.4	128	50.6

A total of 235, or 84.2 percent of the present household members effectively X-rayed, were tuberculin tested.

The results of the tuberculin testing revealed that 41, or 17.4 percent of the individuals, were tuberculin-positive, and 194, or 82.6 percent, were tuberculin-negative. The low rate of positive reactions in individuals of all ages in this group is most easily explained by the absence of contact with active tuberculosis in the households under study, as indicated by the results of the X-ray examinations.

The relationship of the tuberculin reaction to the occurrence of pulmonary calcification is shown in table 5.

TABLE 5.—*Relationship of tuberculin reaction to pulmonary calcification, by age groups, in 235 individuals who were tuberculin tested and X-rayed* [1]

	(A) Under 20 years			(B) 20 years and over			(C) All ages		
	Pulmonary calcification			Pulmonary calcification			Pulmonary calcification		
	Present	Absent	Total	Present	Absent	Total	Present	Absent	Total
Tuberculin reaction:									
Positive	6	0	6	23	12	35	29	12	41
Negative	56	86	142	30	22	52	86	108	194
Total	62	86	148	53	34	87	115	120	235

[1] Since no implication is intended that calcification in any household associate is "secondary" to that found in the index person, index persons are included in the above and in subsequent tabulations.

Age group under 20.—As shown in table 5 (A), 160 household associates in this age group were X-rayed, 148 of whom were tuberculin tested. Among the 12 individuals not tuberculin tested, 6 had pulmonary calcification and 6 had no demonstrable pulmonary calci-

fication. Of the total number X-rayed and tuberculin tested, with pulmonary calcification, 6, or 9.7 percent, were tuberculin-positive and 56, or 90.3 percent, were tuberculin-negative. The table shows that 86 individuals without pulmonary calcification were 100 percent tuberculin-negative.

The association of a positive reaction to tuberculin and pulmonary calcification is found to be statistically significant. However, if it is assumed that a positive tuberculin reaction is evidence of a possible tuberculous origin of the pulmonary calcification found in 6 individuals, there is no explanation for the occurrence of pulmonary calcification in 56 individuals who were tuberculin-negative.

Age group 20 and over.—Ninety-three household associates in this age group were X-rayed, of whom 87 were tuberculin tested, as shown in table 5 (B). Among the individuals not tuberculin tested, 4 had pulmonary calcification and 2 had no demonstrable pulmonary calcification. It is seen from this table that 53 of the individuals tuberculin tested had pulmonary calcification, and of this number 23, or 43.4 percent, were tuberculin-positive. Of the 34 individuals of this age group without pulmonary calcification 12, or 35.3 percent, were tuberculin-positive. These data show no statistically significant association between a positive tuberculin reaction and the occurrence of pulmonary calcification.

Table 5 (C) gives the combined data for the two age groups discussed. There is a statistically significant association of pulmonary calcification with tuberculin positiveness for the entire group.

It is observed that 90.3 percent of the individuals under 20 years of age showing pulmonary calcification were tuberculin-negative as compared with 56.6 percent of those 20 and over. These data suggest that the individuals under 20 with pulmonary calcification had never been tuberculin-positive, and that with an increase in age half of them become tuberculin-positive. It does not seem logical or necessary to assume that the individuals under 20 years of age either had lost an earlier allergy to tuberculin or were anergic.

From the above data and under the conditions of this study a significant statistical correlation between a positive tuberculin reaction and pulmonary calcification has been demonstrated in the study group. However, applying the tuberculin test as a measure of tuberculous infection, 90.3 percent of the pulmonary calcification in the age group under 20, 56.6 percent in the group 20 years of age and over, and 74.8 percent in the entire group could not be considered as of tuberculous etiology by this criterion.

Household history of tuberculosis.—History of tuberculosis was obtained of all members since the establishment of the households involved. Table 6 shows the relationship of a household history of tuberculosis to the occurrence of pulmonary calcification. It is seen

from this table that only 12, or 4.7 percent, of the 253 household associates studied had a household history of tuberculosis. These individuals were members of only 2 households whose history is as follows:

R–32: The head of the household, present age 45 years, was diagnosed as having tuberculosis in 1918 while in France. In 1920 he was hospitalized for 8 months and was discharged as an arrested case. He married and established the present household in February 1919. The first child, born in December 1919, died of rheumatic heart disease in March 1937. The second child was born in 1922, 2 years after the diagnosis of arrested tuberculosis in the father. Three more children were born later.

At the time of this study the head of the household was X-rayed twice, both films showing no evidence of parenchymal pathology indicative of present or past tuberculosis. The only finding was that of calcified hilar glands. Since his hospitalization in 1920 he has been doing hard manual work and has been in good health. His tuberculin reaction is 1 plus. His wife, present age 44, has a 2 plus tuberculin, X-ray findings of calcification of hilar glands, and one parenchymal calcification. The four surviving children born since 1920 are all tuberculin-negative and only one of the three has a pulmonary calcification. This child, a girl aged 18, born in 1922, has multiple parenchymal calcification and also hilar calcification.

TABLE 6.—*Relationship of household history of tuberculosis to pulmonary calcification in 253 household associates who were X-rayed*

Household history of tuberculosis	Pulmonary calcification		
	Present	Absent	Total
Positive	5	7	12
Negative	120	121	241
Total	125	128	253

The results of our study of the head of this household make us doubt whether this individual ever had tuberculosis. However, if the head of the household had not been available for study, and such a history had been obtained, this would have been considered a case of tuberculosis, i. e., a source of household exposure. Therefore, in these data, it is classified as household exposure in spite of our serious doubts.

R–37: The sister-in-law of the head of the house lived in this family only during the month of January 1928, at which time she was ill with tuberculosis. She left the household in February 1928 and died of the disease in July 1928. This household was established in March 1919. There were four children, born during 1920, 1923, 1925, and 1929. Therefore, three of the children and the husband and wife were considered to have been exposed during the month of January 1928. X-rays during the study of these five individuals revealed that the head of the household, aged 41, had a parenchymal calcification. The wife (sister of the case), aged 38, was negative on X-ray. Three of the four children were negative on X-ray and the remaining child, aged 15, had a hilar calcification. Four of the six members were tuberculin tested and only the head of the house was tuberculin-positive. The children born in 1920 and 1929 were not tested.

There is no question that this family was exposed to manifest tuberculosis for 1 month in 1928 (12 years prior to study). It is interesting to note that only one

of the five exposed members was tuberculin-positive and that only two of the exposed group had positive X-ray findings of calcification. The child born 1 year after the household exposure had a negative X-ray.

Assuming that both families were exposed to tuberculosis, it was found that of a total of 12 present members in both families, 6, or 50 percent, showed calcification; 10 of 12 exposed members were tuberculin tested, only 3 of whom were tuberculin-positive. The incidence of calcification in these 2 families is equal to that found in the study group as a whole.

The low incidence of household exposure to tuberculosis, as determined by the household histories, is supported by the absence of significant tuberculous lesions, demonstrable by X-ray, in household associates present at the time of study and further by the low rate of positive reactions to tuberculin for the study group as previously described. No information was obtained from the household histories to suggest that the high prevalence of pulmonary calcification could be explained by a prior case of tuberculosis in the household.

Family history of tuberculosis.—The occurrence of tuberculosis in any member of a family was specifically investigated. The data obtained are given in table 7.

TABLE 7.—*Age distribution of all grandparents, uncles, and aunts of index cases in 43 rural families in Ross County and history of tuberculosis among them at last observation* [1]

Age group	Living		Dead		Age group	Living		Dead	
	Living	Cases of tuberculosis	All deaths	Deaths from tuberculosis		Living	Cases of tuberculosis	All deaths	Deaths from tuberculosis
Unknown	16	1	27	9	35–44	128	0	17	2
Under 1	1	0	51	1	45–54	93	1	17	2
1–4	3	0	18	0	55–59	37	1	6	1
5–9	4	0	4	0	60–69	61	0	32	3
10–14	5	1	6	1	70 and over	27	0	42	1
15–19	21	0	10	0					
20–24	33	0	11	1	All ages	531	4	256	25
25–34	102	0	15	4					

[1] No history was obtained for 1 family, and for another the husband's family history was unobtainable while the wife's is included.

Table 8 gives detailed data on the cases of and deaths from tuberculosis as given in the family history and the extent of contact of present household members to this source of infection.

TABLE 8.—*Relationship of a case of tuberculosis in an uncle, aunt, or grandparent of the index case to the present household*

Household No.	Familial relationship to household members	Age and date of case or death [1]	Date present household established	Present household member with contact		Tuberculin test	Result of X-ray	Total number in household	Number X-rayed	Number with pulmonary calcification
				Present age	Age at contact					
R-1	Wife's father	D-56, 1921	July 25, 1930	32½	14	Negative	Calcification	8	6	4
R-8	Husband's father	D-37, 1905	Aug. 23, 1921	43½	8	Positive	Negative	16	13	4
R-9	Wife's mother	C-59, 1902	Nov. 10, 1927	29	Before birth	do	Calcification	11	9	4
	Husband's grandmother	D-81, 1921	do	38	19	Negative	do	11	9	4
R-12	Wife's mother	D-31, 1914	Oct. 17, 1925	31½	5	Positive	do	14	8	5
R-13	Husband's mother	D-25, 1898	May 20, 1917	45½	3	Negative	do	14	10	6
R-18	Wife's father	D-66, 1914	Mar. 30, 1911	52	25	Positive	Negative	16	6	1
R-26	Wife's mother	D-28, 1911	Apr. 16, 1924	35½	6	do	do	7	5	1
R-31	Wife's father	C-50, 1936	Apr. 7, 1928	29	25	Negative	Calcification, pleural cap.	4	3	3
R-32	Husband's uncle	D-11, 1918	Feb. 28, 1919	45	23	Positive	Calcification	8	6	3
R-37	Wife's sister	D-20, 1929	Mar. 5, 1919	37½	27	Negative	Negative	7	6	3
	Wife's brother [2]	C-14, 1926								
R-41	Wife's mother	D-28, 1898	Jan. 1, 1919	45	3	do	Calcification	7	6	3
R-40	Wife's father	D-?, 1896	Nov. 2, 1912	50	6	do	Negative	13	6	1
R-27	Husband's father	D-60?, 1910	May 17, 1916	60	36	Positive	Calcification	10	7	5
	3 sisters, 1 brother [3]									
R-29	Wife's mother	D-45, 1893	Jan. 2, 1913	51	At intervals from birth to 49 years.	Positive	Calcification	8	5	4
	Father	D-45, 1889								
	4 brothers	D-Young adults, prior to 1889.								
	1 sister	D-38, 1918								
	do	D-64, 1938								
	do	C-When young.								

[1] C indicates case; D, death.
[2] No known contact with household.
[3] Died as young adults prior to 1916.

NOTES.—
R-9. Wife's mother: Living and well at present (1940).
R-18. Wife's father: Has never lived in present household. Household member with pulmonary calcification, child born 1931.
R-31. Wife's father: Father suspected of having tuberculosis in 1936. Diagnosis not confirmed by X-ray. Living and well now. Only contact with present household is occasional visits.
R-32. Husband's uncle: Tuberculosis of hip given as cause of death.
R-37. Wife's sister: Only contact is occasional visit.
R-37. Wife's brother: In the tuberculosis sanatorium in 1926. Living and well now. No contact with present household.
R-41. Wife's mother: Mother died in 1898 from tuberculosis. An infant daughter also died in 1898 from tuberculosis.
R-27. Husband's father, 3 sisters, and 1 brother all died of tuberculosis prior to the date of establishment of the present household.

From table 8 it is apparent that the contact between a case of tuberculosis in the family of either parent of the index case and the members of the present household is remote. Of the households listed as having a positive family history, it is seen that only four were established at a time when a case of tuberculosis existed in some member of the family other than a member of the present household. In three of these households, the contact between the present household members and the familial case was remote. The remaining family (R–29) had a history of five deaths from tuberculosis and one case on the mother's side of the family. Three of the deaths occurred from 20 to 24 years prior to the establishment of the present household, and one occurred 5 years and one 25 years after the establishment of the household. The case of tuberculosis in this family occurred at an early unspecified age in an individual who later died at the age of 65 from heart disease. The authors doubt the authenticity of this case. The only contact between the present household and the family cases was "visiting" the cases prior to death. This must be considered definite though extra-household contact. It has not resulted in any manifest tuberculosis in the household members as evidenced by X-rays of five of a total of eight members. Four of the five members had pulmonary calcification. Results of tuberculin tests on these five persons revealed that the mother had a 1 plus tuberculin reaction. The other four persons, including the father, were tuberculin-negative. If the pulmonary calcifications found in this family were a result of the contact with tuberculosis, it would seem strange that more members of the family were not tuberculin-positive. It is doubtful whether the loss of allergy to tuberculin would account for their negative reaction when their respective ages are considered, namely, 51, 22, 16, and 14 years. The mother, the household member with the most contact, had a parenchymal calcification on X-ray. It seems probable that contact with familial tuberculosis could explain the finding of calcification only in the mother, who was tuberculin-positive.

In the 14 households with a family history of tuberculosis, a minimum of 15 members of the present household had had contact with the familial case. Among this group 7 were tuberculin-negative, 5 of whom had pulmonary calcification; 2 had negative X-rays. Among these 15 persons the only evidence found on X-ray that might be considered evidence of tuberculosis, other than calcification, was a "pleural cap" occurring in an individual who was tuberculin-negative and who also had a pulmonary calcification.

Table 9 summarizes the relationship of a family history of tuberculosis to the occurrence of pulmonary calcification. It is seen from this table that a positive family history of tuberculosis was obtained in 45, or 36 percent, of 125 individuals with pulmonary calcification. This is not a statistically significant correlation.

TABLE 9.—*Relationship of a family history of tuberculosis to pulmonary calcification in 253 household associates*

Family history of tuberculosis	Pulmonary calcification		
	Present	Absent	Total
Positive	45	56	101
Negative	80	72	152
Total	125	128	253

OTHER ILLNESSES STUDIED IN THE HOUSEHOLD MEMBERS

Specific inquiry was made in all households as to the occurrence of pertussis, pneumonia, and diarrhea in any of the members. Table 10 summarizes the occurrence of these diseases in the 253 household associates who were effectively X-rayed. It is seen that these diseases have no significant relation to the occurrence of pulmonary calcification.

TABLE 10.—*Relationship of pertussis, pneumonia, and diarrhea to pulmonary calcification in 253 household members effectively X-rayed*

X-ray finding	Total number X-rayed	Pertussis		Pneumonia		Diarrhea	
		Number positive	Percent positive	Number positive	Percent positive	Number positive	Percent positive
Calcification present	125	97	77.6	18	14.4	7	5.6
Calcification absent	128	80	62.5	18	14.1	9	7.0

Certain of the families were studied by Senior Mycologist C. W. Emmons (7) of the National Institute of Health for any evidence of the presence of *Coccidioides* as a possible factor in the etiology of the pulmonary calcification. His results were uniformly negative.

Throughout this study, an effort was made to discover any clinical syndrome or illness in the individuals with pulmonary calcification that might be considered related to the X-ray findings. This was uniformly unsuccessful, even in children where the X-ray evidence indicated that the process of calcification was incomplete. Consultation with family physicians revealed nothing in the way of past clinical illness which could be related to the presence of the pulmonary calcification. The children almost invariably presented the picture of robust health and, with the exception of illnesses listed, had a past history of good health.

DISCUSSION

It is evident from the data given that no significant relationship could be demonstrated between contact with known tuberculosis and the occurrence of pulmonary calcification in the groups studied.

Evidence of absence of household or familial exposure to tuberculosis was supported by the results of four different procedures used to measure tuberculous infection. These results were:

1. X-ray examination of present household members demonstrated the almost complete lack of any lesions which could be considered evidence of tuberculous infection other than pulmonary calcification.
2. Tuberculin tests of household associates resulted in the finding of a very low incidence of positive tuberculin reactions in the entire study group.
3. Detailed histories on the occurrence of tuberculosis in present or past household associates yielded little evidence to indicate that previous members of the household may have been a source of tuberculous infection.
4. Family histories revealed no significant relationship between the pulmonary calcification found in the study group and previous familial cases of tuberculosis.

These findings all indicate that pulmonary calcification as observed in this study has little demonstrable relationship to tuberculosis.

THE POSSIBLE RELATIONSHIP OF *Ascaris* TO PULMONARY CALCIFICATION

Our interest in the possible role of parasites in the production of pulmonary calcification was initiated by the rather close correlation between the distribution of such calcification and the areas of high incidence of *Ascaris lumbricoides* in man. Although available data are limited in nature and there are exceptions to the rule, in general the distribution of pulmonary calcification in the southeastern United States corresponds closely to the area of high *Ascaris* incidence in the Appalachian Plateau and its foothills, the area defined by Otto and Cort (*8*) as the endemic center of *Ascaris*.

It is a fact well known to parasitologists that the death of adult worms and the arrestment of parasite larvae in parenchymatous tissues are frequently followed by the production of a granulomatous type of lesion grossly and sometimes microscopically indistinguishable from the lesions of this type which characterize certain chronic bacterial diseases. For instance, the nodular lesions produced in the lungs of sheep, goats, and some other ruminants by the lungworm, *Muellerius capillaris*, are of the typical granulomatous type and may eventually calcify, at which stage they are easily detectable on X-ray examination of living animals. Similarly, the nodules which occur so frequently in the lungs of swine and which so closely resemble the lesions of tuberculosis are due to the lungworm, *Metastrongylus elongatus*, as pointed out by Day, Bengston, and Raffensperger (*9*). *Capillaria hepatica*, a parasite encountered in the liver of certain rodents and reported at least once from man, commonly is surrounded by a granu-

lomatous reaction in which calcium is rather early deposited. Otto and von Brand (*10*) have shown that such calcification can be materially hastened by the injection into infected animals of parathormone.

Many workers have observed that the larvae of *Ascaris lumbricoides* may become entrapped in the course of their migration through the body of experimental animals and that dead larvae may be found in both the liver and lungs of these animals. One of us (*11*) has frequently noted worm nodules in the lungs, liver, and kidneys of dogs subjected to repeated experimental infections with the dog ascarid, *Toxocara canis*, some of these nodules being caseo-calcareous in nature and containing larvae identified as those of *T. canis*. Such nodules were encountered much more frequently in dogs on a normal diet than in litter mates on a vitamin-A deficient diet. The latter diet apparently lowers the resistance of the animal so that the larvae complete their migration in such cases instead of being retained in the tissues. During recent years, a considerable bulk of evidence has accumulated to indicate that animals acquire a certain amount of resistance as a result of some parasitic infections and that when such animals are exposed to subsequent infections migrating larvae are held in the tissues and are unable to pursue their normal path of migration. Some of the mechanisms of this arrestment have even been elucidated.

Soon after the discovery of the life cycle of *A. lumbricoides* by Stewart (*12*), Ransom (*13*) pointed out the acute manifestations connected with the migration of *Ascaris* larvae through the lungs of susceptible animals and noted that the problem should be carefully investigated in human infections. Since that time various studies have been made to this end.

Scott (*14*) reported on the X-ray examination of 14 cases of *Ascaris* infection. He stated that there was uniform thickening of the hilar shadows but no evidence of definite calcification in the hilum or parenchyma. He concluded that the X-ray findings were similar to those found in any acute respiratory infection.

Wampler and Sutton (*15*) studied a total of 99 individuals repeatedly exposed to *Ascaris* infection and conducted extensive clinical and roentgenographic observations on 9 children from the group. Although no positive evidence was obtained, these authors concluded that some of the bronchitis found may have been due to migrating *Ascaris* larvae.

Several authors have associated *Ascaris* with Löffler's syndrome. Wild and Loertscher (*16*) described two cases of transitory lung infiltration in children infected with *A. lumbricoides* and considered the shadows in the lung fields to be due to migrating larvae of this parasite. Müller (*17*) discussed several similar cases of transitory lung infiltration associated with eosinophilia. He regarded *Ascaris* as the etiolog-

ical agent in these cases and recognized the condition as a definite pathological entity in man.

Keller, Hillstrom, and Gass (*18*) made an X-ray study of the lungs of 80 children with *Ascaris* and 40 children free of *Ascaris* at the time of observation. Children in both groups were negative to the tuberculin test. The studies showed that the widening in the hilar areas, with increase in the bronchovascular markings, was more pronounced in the *Ascaris*-positive children. The authors considered that this condition was due possibly to the repeated migration of larvae of this parasite through the lungs. No pulmonary calcification was encountered in the children positive for *Ascaris* but pulmonary calcification was noted in 8 of the *Ascaris*-negative children, a finding attributed to healed tubercular lesions.

METHODS OF COLLECTION AND EXAMINATION OF SAMPLES FOR PARASITOLOGICAL STUDY

Stool samples.—One-ounce tin containers were distributed to each present member of the households for the collection of fecal samples. The name of each individual and the date of collection of the sample were written on the container and all containers were sent to the laboratory by first-class mail to insure speedy transit and prompt delivery. At the laboratory the containers were kept in an icebox until the samples were examined. For examination, approximately 1 gram of unstrained feces was mixed with tap water in a 50 cc. centrifuge tube, shaken vigorously, and centrifuged at 1,000 revolutions per minute for 2 minutes. The supernatant fluid was poured off, zinc sulfate (specific gravity 1.180, as recommended by Faust et al. (*19*)) was added, the mixture was again shaken vigorously and centrifuged at approximately 2,400 revolutions per minute for 2 minutes. Approximately 0.2 cc. of the top fluid was pipetted onto a slide and examined under the microscope for helminth ova and protozoan cysts. Three slide examinations of each sample were made. No attempt was made to determine in our positive cases the intensity of helminth infection by the dilution egg counting method, partly because of the small size of the fecal sample in most instances and partly because our positive helminth findings were too few to have much significance.

Soil samples.—Soil samples were collected in half-pint cartons, labeled as to location and date of collection, and mailed to the laboratory. The samples were taken from the vicinity of each home in places where human or animal pollution of the soil was seen or suspected. Particular attention was paid to the areas within the fenced-in yard surrounding the homes, in the gardens, and in the play areas of the children, whenever there was evidence of drainage toward these areas from nearby hog lots or pens. A diagram of

drainage for each household area was made at the time of collection of the samples.

In the examination of the soil samples for ova of parasites, the isolation technique described by Spindler (*20*) was used. The sample was thoroughly crushed and mixed, a 10-gram portion was placed in a 50 cc. centrifuge tube, treated for 30 to 40 minutes with 10 cc. of 30 percent antiformin solution, and frequently stirred. The tube was then filled with sodium dichromate (specific gravity 1.35), well shaken, and centrifuged at 1,000 revolutions per minute for 2 minutes. Approximately 0.2 cc. of the top fluid was pipetted onto a slide and examined under the microscope. Three slide examinations of each of the 10-gram portions were made. The different stages of development of the eggs were recorded. The small amount of material examined in each sample almost certainly resulted in failure to pick up very light infections.

RESULTS OF PARASITOLOGICAL EXAMINATIONS

Stool samples.—A total of 253 persons was included in the survey. Of this number 18 failed to submit a stool sample. The positive helminth findings for the 235 individuals who submitted stools were as follows: *Ascaris lumbricoides* 5, or 2 percent; *Trichuris trichiura* 6, or 3 percent; *Enterobius vermicularis* 4, or 2 percent; hookworm 2, or 1 percent; *Strongyloides stercoralis* 2, or 1 percent; and *Hymenolepis nana* 10, or 4 percent.

All of the worm infestations were single with the exception of one case, that of a 15-year old girl who harbored both *Trichuris trichiura* and *Hymenolepis nana.*

The 5 *Ascaris* cases occurred in 2 households, 4 cases in a family of 5 members, and 1 in a family of 7 members. Of the 253 persons included in the study, 31 had a past history of known *Ascaris* infection.

The positive findings of protozoan cysts for the 235 persons examined were as follows: *Endamoeba coli* 122, or 52 percent; *Endamoeba histolytica* 27, or 11 percent; *Chilomastix mesnili* 18, or 8 percent; *Iodamoeba bütschlii* 16, or 7 percent; *Giardia lamblia* 11, or 5 percent; and *Endolimax nana* 11, or 5 percent. Some of these infections were mixed.

The relatively high percentage of individuals harboring cysts of *Endamoeba histolytica* is rather striking in view of the fact that none had any clinical symptoms. Only 16 individuals of the 253 included in the study gave a past history of diarrhea.

The distribution of parasitic infections among individuals, with and without pulmonary calcification, arranged according to age groups, is shown in table 11.

TABLE 11.—*Incidence of parasitic infections and exposure to swine Ascaris in persons (with and without pulmonary calcification) arranged according to age groups*

Age group	Parasitic infections as indicated by stool examinations																Past history of human *Ascaris* infection		Potential exposure to swine *Ascaris* as indicated by—						Total persons
	No sample	*Ascaris lumbricoides* (ova)		*Trichuris trichiura* (ova)		Other worms (ova)		*Endamoeba coli* (cysts)		*Endamoeba histolytica* (cysts)		Other protozoa (cysts)		Worm ova and protozoan cysts				*Ascaris* ova in soil		Hogs on farm		Drainage from hog lots		
		+	−	+	−	+	−	+	−	+	−	+	−	+	−			+	−	+	−	+	−	
With pulmonary calcification																									
Under 5	0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0	1	0	1	0	1
5–9	0	0	8	1	7	0	8	3	5	0	8	1	7	1	7	1	7	5	3	8	0	1	7	8
10–14	1	1	32	0	33	4	29	17	16	4	29	4	29	4	29	3	31	17	17	25	9	11	23	34
15–19	3	0	22	0	22	1	21	13	9	5	17	7	15	1	21	4	21	14	11	22	3	9	16	25
20–34	1	0	15	0	15	0	15	7	8	2	13	4	11	0	15	4	12	9	7	15	1	8	8	16
35–54	1	0	34	0	34	1	33	21	13	4	30	6	28	1	33	6	29	17	18	27	8	13	22	35
55 and over	1	0	5	1	4	0	5	3	2	0	5	1	4	1	4	1	5	1	5	5	1	1	5	6
Total	7	1	117	2	116	6	112	64	54	15	103	23	95	8	110	19	106	64	61	103	22	44	81	125
Without pulmonary calcification																								
Under 5	5	1	16	0	17	1	16	7	10	1	16	4	13	1	16	2	20	8	14	17	5	10	12	22
5–9	5	2	25	0	27	5	22	13	14	3	24	6	21	3	24	2	30	16	16	25	7	12	20	32
10–14	0	0	28	2	26	3	25	16	12	2	26	5	23	4	24	1	27	13	15	25	3	10	18	28
15–19	1	0	9	1	8	2	7	4	5	1	8	2	7	1	8	0	10	3	7	8	2	2	8	10
20–34	0	1	11	0	12	0	12	6	6	1	11	1	11	0	12	3	9	3	9	11	1	3	9	12
35–54	0	0	22	1	21	0	22	11	11	4	18	3	19	0	22	4	18	11	11	18	4	6	16	22
55 and over	0	0	2	0	2	1	1	1	1	0	2	0	2	0	2	0	2	1	1	2	0	0	2	2
Total	11	4	113	4	113	12	105	58	59	12	105	21	96	9	108	12	116	55	73	106	22	43	85	128
Grand total	18	5	230	6	229	18	217	122	113	27	208	44	191	17	218	31	222	119	134	209	44	87	166	253

Soil samples.—Soil samples were collected from all but 2 of the 44 households included in this study and these 2 were omitted because of the short period of residence of the families on these farms. A total of 204 soil samples was collected from the 42 households, an average of nearly 5 per household. Of this total, 28, or 14 percent, were found positive for ova of *Ascaris lumbricoides*, but these positive samples came from 20, or 48 percent, of the households. The majority of the eggs found were in either the embryonated or the developing stage. The positive soil samples were from places where human contact with the soil was most likely, for instance, in the children's play area, around the back door or porch, around the front of the house, and on the floor of or near the entrance to the privy.

There were only 2 positive soil samples in which the *Ascaris* eggs were undoubtedly of human origin. Both of these samples were from households with members found positive for *Ascaris lumbricoides* on stool examination. In the household with 1 individual positive for *Ascaris* infection, *Ascaris* eggs, mostly embryonated, were found in the soil taken from the floor of an old garage in which numerous soiled papers were seen, and we consider them beyond doubt human *Ascaris*. The only other positive soil sample from this farm was collected along the side of the barn near the entrance to the section housing hogs and the latter are considered the source of the *Ascaris* ova. In the other household with 4 members positive for *Ascaris* infection, 3 soil samples were found positive. In only 1, collected from the floor of the privy near stools on floor, were the eggs, most of them dead, undoubtedly from a human source. There was no evidence of human soil pollution anywhere in the yard or in the play area where 44 hogs maintained on this farm were allowed to roam at will. Consequently, the eggs found in the soil from around the back steps and in the play area where both pigs and children's toys were observed are considered of suilline origin.

It is probable that the *Ascaris* eggs in the soil samples from the remaining 18 positive households came from hogs. Only 1 farm was without hogs at the time the samples were collected. The hogs had been sold the previous fall but the family had always had hogs and when the children were young they played with hogs. A 19-year-old boy in this family had pulmonary calcification. On 8 of the farms there were anywhere from 50 to 300 hogs; on 1 there were between 25 and 50; and on the remaining farms there were 12 hogs or less.

The number of hogs on a farm does not necessarily determine the intensity of exposure to hog parasites. It was often observed that a family with one or two hogs would keep them in the yard around the house or in a pen very close to the house. This must have resulted in certain instances in a very heavy exposure of the household members to hog parasites.

Other helminth eggs were found in the soil samples, as follows: *Ascaridia galli* in 48; degenerated ascarid eggs in 7; *Parascaris equorum* in 1; *Toxocara* in 22; *Toxascaris* in 1; *Capillaria* spp. in 11; *Trichuris* spp. in 16; trichurid-like[4] eggs in 35; *Hymenolepis diminuta* in 1.

DISCUSSION OF PARASITOLOGICAL OBSERVATIONS

From the foregoing data and table 11 it is apparent that the incidence of parasites both in human beings and in soil samples near homes is so similar for the groups with and without pulmonary calcification that no significant conclusion can be drawn. The marked difference in age distribution between these two groups is striking. Only 7 percent of the group with pulmonary calcification, were under 10 years of age and 34 percent were under 14, as compared to 42 and 64 percent, respectively, in the group without pulmonary calcification. If *Ascaris* is involved in the development of pulmonary calcification, the lower incidence of such calcification in young children, as shown by our findings, may be explained by the assumption that this calcification develops only after a considerable lapse of time following initial infection, or after repeated exposure.

While no information was obtainable from State or local health authorities, it was assumed that there would be little or no infection with human *Ascaris* in Ross County, Ohio, and the results of our study support this assumption. The incidence of swine *Ascaris* was not known, but the parasite may be assumed to be endemic throughout the State. Our data show that *Ascaris* infection in hogs is prevalent in Ross County, as might be expected, that *Ascaris* eggs are more or less widespread in the soil, and that there was ample opportunity for human infection from contact with contaminated soil.

It is difficult to evaluate the exact role of swine *Ascaris* in human lung infections. Even though the parasite does not complete its development in man, there is evidence that the larvae penetrate to the lung during the course of their migration and that very definite lung symptoms may occur as a result of this invasion. There is no doubt that many of these larvae may be trapped in the lungs.

The classical experiment of Koino (*21*) offers direct evidence concerning the pathogenicity of the migrating larvae of the swine ascarid in man. Koino himself swallowed 2,000 infective ova of the human *Ascaris* and experimentally infected his brother with 500 ova of swine *Ascaris*. Both individuals developed the same symptoms of bronchopneumonia, including fever, difficulty in breathing, pain in the chest, and pulmonary infiltration, except that the author himself suffered more severely because of the larger number of ova swallowed. Koino recovered many larvae from his own sputum and 50 days after in-

[4] It was not possible to make a generic determination of these eggs.

fection 667 immature ascarids were passed following anthelmintic treatment. In the case of the brother, no larvae were found in the sputum and no worms were recovered from the intestine.

At the time the present investigation was started it was not anticipated that results of work based on epidemiological studies alone would have a decisive bearing on delineating the role of *Ascaris* in pulmonary calcification. In the first place, it is not possible in a study of this sort to measure the extent of exposure, to delimit the period of *Ascaris* intake, to gauge the degree of pulmonary damage, or even to guess as to the length of time needed for the appearance of calcification in any lesions which might possibly be due to parasite larvae. It is considered that the results of the present study neither prove nor disprove the hypothesis upon which the work was predicated. Undoubtedly additional field observations are in order, supplemented by suitable experimental work on the effects of long-continued exposure to *Ascaris* larvae. Experiments to date certainly throw little light on the problem because they have been concerned almost entirely with the acute manifestations of pulmonary damage. However, until additional evidence is available, it is believed that the parasite in question should not be ruled out as a possible etiological agent in pulmonary calcification.

CONCLUSIONS

1. A high incidence of pulmonary calcification which could not be related to tuberculosis has been observed in household associates in a group of families in Ross County, Ohio.

2. This pulmonary calcification appears to result from an as yet unrecognized disease of very common occurrence which produces pulmonary lesions closely simulating the X-ray picture of primary tuberculosis.

3. The finding of pulmonary calcification, particularly in tuberculin-negative individuals, should not be assumed to be evidence of infection with tuberculosis.

4. On the basis of the data furnished by this epidemiological study, we were unable either to prove or disprove the possible role of *Ascaris* as a causative agent in pulmonary calcification.

ACKNOWLEDGMENTS

The authors wish to acknowledge gratefully the assistance received in various phases of this investigation from several individuals and groups. Dr. R. Markwith, State health officer, lent encouragement to the study and kindly detailed special nurse Miss F. Glenn to aid in the work in Ross County; Dr. R. Bower, health commissioner of Ross County, manifested a keen personal interest and freely gave his

cooperation at all times; Mr. H. Boecher, sanitation officer, and Miss L. Thornton, tuberculosis nurse, of Ross County, also cooperated. The Tuberculosis Study Group, State of Tennessee, and particularly Dr. R. S. Gass and Dr. W. Murphy, were consulted in regard to certain techniques used.

REFERENCES

(1) Gass, R. S., Gauld, R. L., Harrison, E. F., Stewart, H. C., and Williams, W. C.: Tuberculosis studies in Tennessee. Roentgenological evidence of tuberculosis infection in relation to tuberculin sensitivity in school children. Am. Rev. Tuberc., **38**: 441–447 (October 1938).

(2) Lumsden, L. L., and Dearing, W. P.: Epidemiological studies of tuberculosis. Am. J. Pub. Health, **30**: 219–228 (March 1940).

(3) Dearing, W. P., Olson, B. J., Self, L. R. W., and Baggett, M. W.: A comparison of household attack rates in regions with high and low mortality. (In press.)

(4) Keeler, F. R.: The geology of Ross County. (Unpublished.)

(5) Frost, W. H.: Risk of persons in familial contact with pulmonary tuberculosis. Am. J. Pub. Health, **23**: 426–432 (May 1933).

(6) Furcolow, M. L., Hewell, B., Nelson, W. E., and Palmer, C. E.: Quantitative studies of the tuberculin reaction. I. Titration of tuberculin sensitivity and its relation to tuberculous infection. Pub. Health Rep., **56**: 1082–1100 (May 23, 1941).

(7) Emmons, C. W.: (Unpublished data).

(8) Otto, G. F., and Cort, W. W.: The distribution and epidemiology of human ascariasis in the United States. Am. J. Hyg., **19**: 657–712 (May 1934).

(9) Day, L. E., Bengston, J. S., and Raffensperger, H. B.: Parasitic nodules resembling tuberculosis in the lungs of swine. J. Am. Vet. Med. Assoc., **71**: 39–51 (April 1927).

(10) Otto, G. F., and von Brand, Th.: Natural and experimental calcification in *Capillaria hepatica* infection. Am. J. Hyg., **34**: (D) 13–17 (July 1941).

(11) Wright, W. H.: (Unpublished data).

(12) Stewart, F. H.: On the life-history of *Ascaris lumbricoides*. Brit. Med. J., **2**: 5–7, 753–754 (1916).

(13) Ransom, B. H.: A newly recognized cause of pulmonary disease—*Ascaris lumbricoides*. J. Am. Med. Assoc., **73**: 1210–1212 (Oct. 18, 1919).

(14) Scott, C. W.: Pulmonary findings in a clinical study of *Ascaris* infection in children. Virginia Med. Monthly, **57**: 34–37 (April 1930).

(15) Wampler, F. J., and Sutton, L. E., Jr.: A study of the lung involvement in human ascariasis. Virginia Med. Monthly, **59**: 65–72 (May 1932).

(16) Wild, O., and Loertscher, M.: Zur Aetiologie der flüchtigen Lungeninfiltrierungen. Schweiz. Med. Wchnsch., **64**: 829–830 (September 1934).

(17) Müller, R. W.: Über die flüchtigen eosinophilen Lungeninfiltrate zur Frage der Lungenentzündungen durch Spulwurmlarven. Beitr. Klin. Tuberk., **92**: 254–274 (1938).

(18) Keller, A. E., Hillstrom, H. T., and Gass, R. S.: The lungs of children with *Ascaris*. A roentgenologic study. J. Am. Med. Assoc., **99**: 1249–1251 (Oct. 8, 1932).

(19) Faust, E. C., D'Antoni, J. S., Odom, V., Miller, M. J., Peres, C., Sawitz, W., Thomen, L. F., Tobie, J., and Walker, J. H.: A critical study of clinical laboratory technics for the diagnosis of protozoan cysts and helminth eggs in feces. I. Preliminary communication. Am. J. Trop. Med., **18**: 169–183 (March 1938).

(20) Spindler, L. A.: On the use of a method for the isolation of *Ascaris* eggs from soil. Am. J. Hyg., **10**: 157–164 (July 1929).

(21) Koino, S.: Experimental infections on human body with ascarides. Japan Med. World, **2**: 317–320 (Nov. 15, 1922).

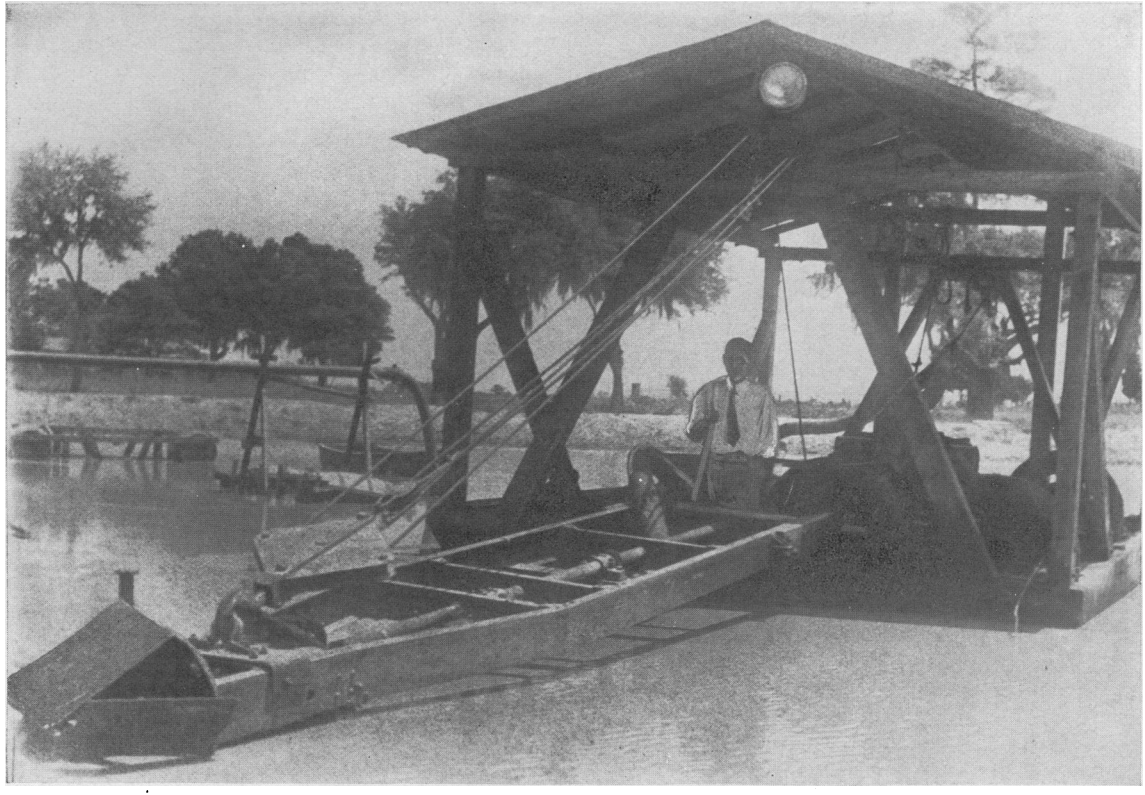


FIGURE 1.—Home-made hydraulic dredge.

HOME-MADE SUCTION DREDGE

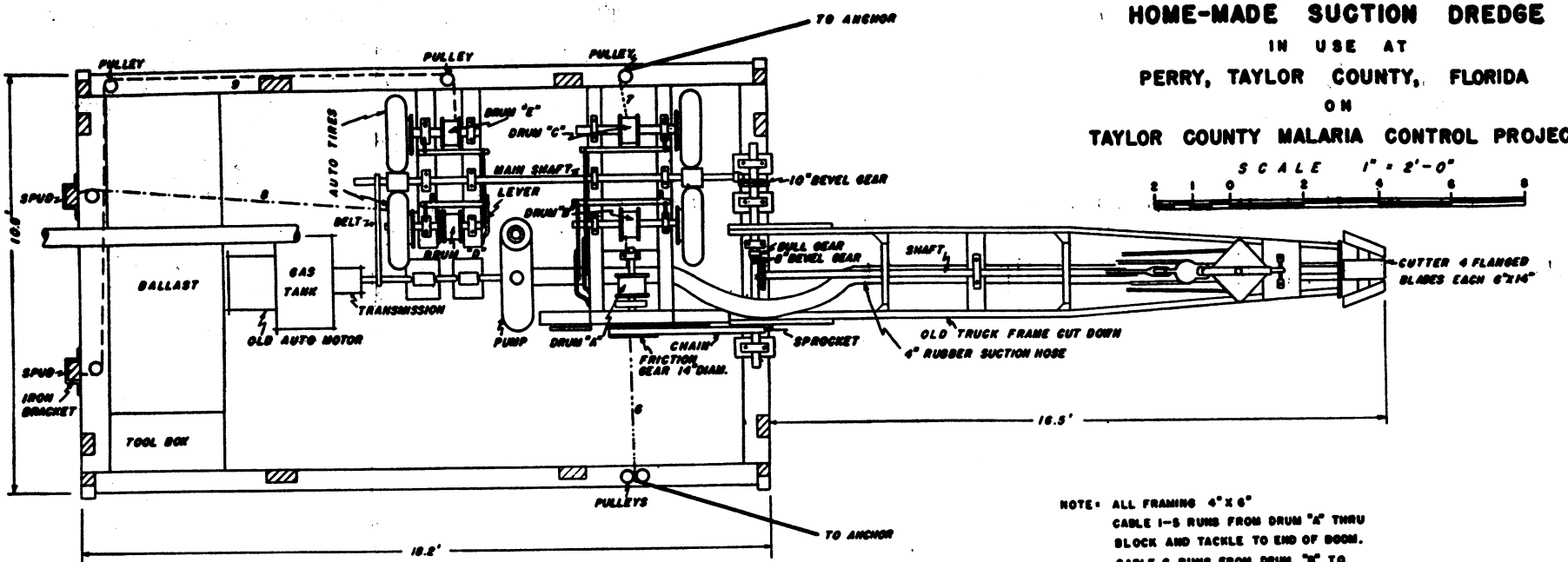
IN USE AT

PERRY, TAYLOR COUNTY, FLORIDA

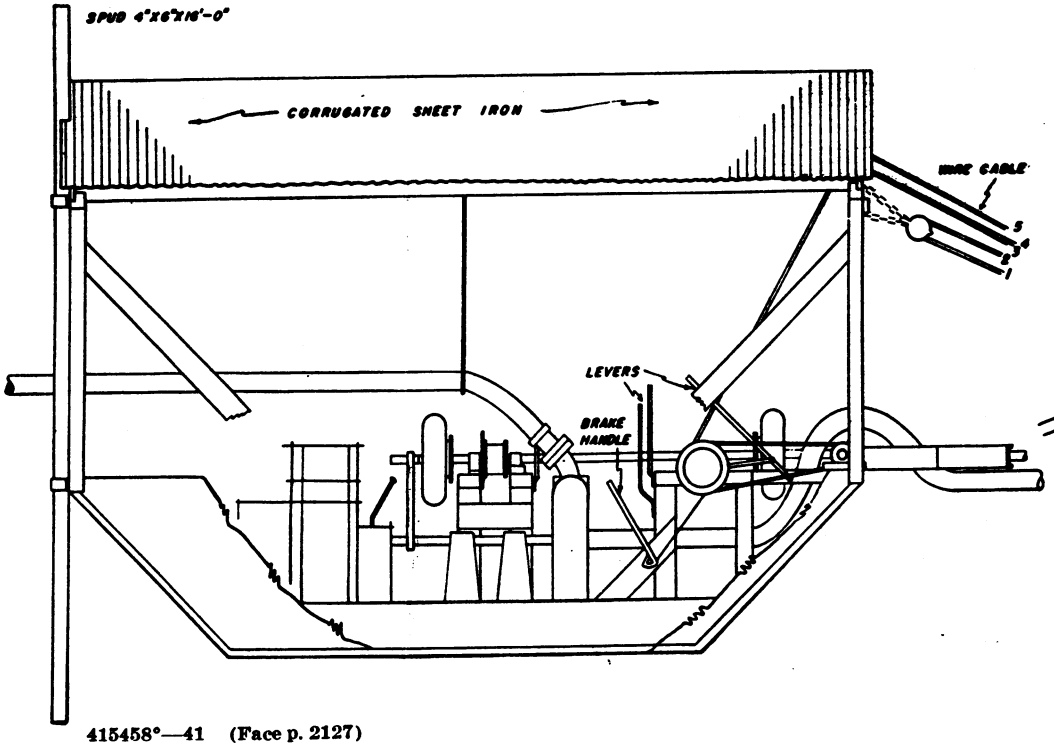
ON

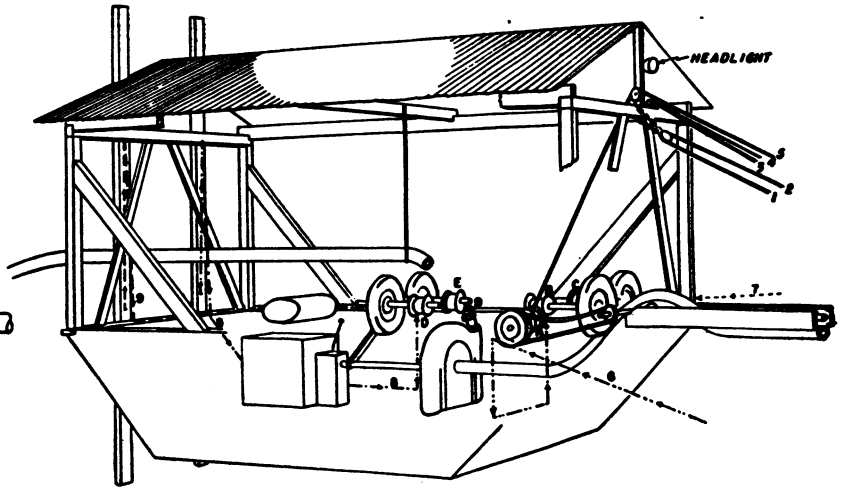
TAYLOR COUNTY MALARIA CONTROL PROJECT

SCALE 1" = 2'-0"



NOTE: ALL FRAMING 4" X 6"
CABLE 1-5 RUNS FROM DRUM "A" THRU BLOCK AND TACKLE TO END OF BOOM.
CABLE 6 RUNS FROM DRUM "B" TO ANCHOR ON RIGHT.
CABLE 7 RUNS FROM DRUM "C" TO ANCHOR ON LEFT.
CABLE 8 RUNS FROM DRUM "D" TO SPUD ON LEFT.
CABLE 9 RUNS FROM DRUM "E" TO SPUD ON RIGHT.





PERSPECTIVE VIEW
SHOWING LOCATION OF CABLES

DESCRIPTION OF HOME-MADE HYDRAULIC DREDGE EMPLOYED IN MALARIA CONTROL AT PERRY, FLORIDA

By A. C. NEWMAN, *Assistant Engineer, Florida State Board of Health*

A shallow pond and a "boil" at the head of Spring Creek, both located within the town limits of Perry, Florida, were sources of prolific production of *Anopheles quadrimaculatus*. The pond was practically undrainable. It was considered desirable, therefore, to deepen both the pond and the "boil" and to steepen their banks, the "spoil" to be used to fill in shallow areas along the shore lines. To accomplish these aims a home-made hydraulic dredge was designed and constructed through the ingenuity of the county sanitary officer and two interested citizens.

The dredge cost slightly over $500, aside from the pump which cost $191.50 when new. This pump was originally purchased by the city for other purposes and was not used; it therefore entailed no cash outlay for this project. Much material from auto junk yards was used in the construction of the dredge, as may be seen from the drawing and photographs, and this was a factor in its low cost. Labor of construction amounted to $217.65, hardware $61.33, lumber $161.75, boom and cutter bar $75, and miscellaneous items $23. These items, totaling $538.73, constitute the cash outlay.

A used automobile engine, including the transmission, serves as the source of power. The pump (rated at 750 G. P. M., 16 feet head, 20 H. P.) is in line with and is driven by this engine. A belt from the pump drive shaft turns the main shaft from which, through gears, power is taken off to drive the cutter shaft. The spuds are operated by means of cables from drums which are driven by old automobile wheels equipped with discarded outer casings; these in turn are driven by friction from the main shaft. The front end anchorages are controlled in the same manner. The boom is an old truck frame cut down. It is controlled vertically by cables from a drum driven by a sprocket and chain power take-off from the forward shaft. "Spoil" is sucked into a 4-inch suction hose behind the cutter blades. The discharge line from the pump is floated ashore on barrels. The hand levers are merely 1½-inch by ¼-inch iron bars.[1]

Work with the dredge was first started at the "boil" at the head of Spring Creek, where approximately 700 cubic yards of excavation and hydraulic fill were handled at a cost of 23 cents per cubic yard. Next, the pond was conditioned by dredging in a circle approximately 200 feet in diameter. Thirty-five hundred cubic yards of fill were made at this site at a cost of 16 cents per cubic yard. The difference in unit cost of hydraulic fill at the "boil" and at the pond is explained by the fact that limestone rock was encountered in the dredging operations at the former location.

DEATHS DURING WEEK ENDED OCTOBER 18, 1941

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

	Week ended Oct. 18, 1941	Corresponding week, 1940
Data from 88 large cities of the United States:		
Total deaths	7,509	7,549
Average for 3 prior years	7,813	
Total deaths, first 42 weeks of year	351,752	352,863
Deaths per 1,000 population, first 42 weeks of year, annual rate	11.7	11.7
Deaths under 1 year of age	541	496
Average for 3 prior years	475	
Deaths under 1 year of age, first 42 weeks of year	22,089	21,064
Data from industrial insurance companies:		
Policies in force	64,546,105	64,784,337
Number of death claims	9,186	10,765
Death claims per 1,000 policies in force, annual rate	7.4	8.7
Death claims per 1,000 policies, first 42 weeks of year, annual rate	9.5	9.7

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

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 25, 1941

Summary

The total number of cases of poliomyelitis decreased from 312 to 294 during the current week although slight increases were recorded for several States. The following-named 6 States reported 15 or more cases (last week's figures in parentheses): New York 57 (55); Tennessee 22 (17); Ohio 17 (14); Pennsylvania 16 (30); New Jersey 15 (12); and Minnesota 15 (11).

The incidence for the country as a whole is still above the 5-year (1936–40) median (197 cases), but has been continuously below the 1940 weekly figures since the latter part of August. The total cases reported to date this year, 7,885, is below the number reported for both 1940 (8,383 cases) and 1937 (8,853), the two years of highest incidence during the past 5 years.

The number of reported cases of influenza increased from 1,131 to 1,330, of which 543 cases were reported in Texas, 177 in Virginia, and 162 in South Carolina; these 3 States reported two-thirds of the total. The current incidence and the cumulative total to date are above the figures for the corresponding periods of each of the past 5 years. The sharp rise in the incidence of influenza last year occurred about the middle of November, when the disease began to assume epidemic proportions on the Pacific Coast.

Of the 9 communicable diseases included in the following table, only influenza, measles, and poliomyelitis were above the median expectancy during the current week. One-third of the cases of whooping cough were reported from the East North Central States, and almost one-half of the diphtheria cases were reported from the South Atlantic States.

Of 69 cases of endemic typhus fever, 27 occurred in Georgia, 16 in Texas, and 10 each in Alabama and Louisiana.

The death rate for the current week for 88 large cities in the United States is 11.0 per 1,000 population, as compared with 10.6 for the preceding week and 11.1 for the 3-year (1938–40) average for the corresponding week.

Telegraphic morbidity reports from State health officers for the week ended October 25, 1941, and comparison with corresponding week of 1940 and 5-year median

In these tables a zero indicates a definite report while leaders imply that, although none were reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended		Median 1936–40	Week ended		Median 1936–40	Week ended		Median 1936–40	Week ended		Median 1936–40
	Oct. 25, 1941	Oct. 26, 1940		Oct. 25, 1941	Oct. 26, 1940		Oct. 25, 1941	Oct. 26, 1940		Oct. 25, 1941	Oct. 26, 1940	
NEW ENG.												
Maine	0	1	2	-------	1	-------	62	71	14	2	0	0
New Hampshire	0	0	0	-------	-------	-------	1	0	1	0	0	0
Vermont	4	0	0	-------	-------	-------	1	6	6	0	0	0
Massachusetts	2	5	5	-------	-------	-------	101	159	73	2	1	1
Rhode Island	0	0	0	-------	-------	-------	9	0	3	0	0	0
Connecticut	0	1	1	-------	-------	1	21	3	8	0	0	0
MID. ATL.												
New York [2]	16	16	18	[1]4	[1]3	[1]7	71	157	89	0	1	3
New Jersey	9	8	9	3	1	5	40	74	41	0	0	1
Pennsylvania	8	6	23	1	-------	-------	123	369	46	5	2	3
E. NO. CEN.												
Ohio	20	9	34	6	15	15	63	11	17	0	0	2
Indiana	17	8	28	29	9	10	1	16	11	0	3	3
Illinois	12	12	32	8	5	8	32	135	17	2	2	2
Michigan [3]	9	6	20	-------	-------	1	38	168	44	2	1	2
Wisconsin	2	1	3	18	25	25	53	131	33	1	0	1
W. NO. CEN.												
Minnesota	2	1	3	1	2	2	4	0	8	0	1	1
Iowa	2	9	9	-------	4	1	28	55	5	1	0	0
Missouri	10	13	14	10	1	15	7	7	7	0	0	0
North Dakota	0	4	3	1	-------	4	86	0	0	0	1	0
South Dakota	3	1	2	-------	-------	-------	2	2	2	0	0	0
Nebraska	3	5	2	-------	-------	-------	4	8	2	0	0	0
Kansas	3	6	-------	1	7	6	18	6	6	1	0	0
SO. ATL.												
Delaware	2	0	0	-------	-------	-------	0	1	1	0	0	0
Maryland [3]	7	5	11	4	2	6	11	2	5	3	1	1
Dist. of Col.	1	0	6	1	-------	-------	1	2	2	0	0	1
Virginia [3]	49	27	67	177	56	47	37	29	9	1	0	2
West Virginia	15	4	28	14	2	10	61	1	2	0	2	2
North Carolina [4]	125	85	142	-------	3	3	115	6	51	3	0	2
South Carolina [3]	41	27	29	162	198	221	6	2	2	0	2	1
Georgia [3]	53	28	42	30	19	19	11	3	2	0	0	0
Florida	5	5	11	34	-------	2	1	2	2	1	0	0
E. SO. CEN.												
Kentucky	11	20	37	-------	-------	5	11	51	35	2	2	2
Tennessee	24	16	43	8	19	19	13	16	2	3	2	2
Alabama [3]	44	31	40	21	24	33	27	3	2	1	1	2
Mississippi [2 3]	14	11	17	-------	-------	-------	-------	-------	-------	0	1	1
W. SO. CEN.												
Arkansas	[5]14	12	24	[5]27	35	24	13	0	4	0	0	0
Louisiana [3]	5	20	23	6	4	10	0	1	1	0	0	1
Oklahoma [4]	11	24	24	51	18	33	35	6	2	0	0	0
Texas [3]	82	47	39	543	217	189	17	17	8	0	0	1
MOUNTAIN												
Montana	2	2	1	-------	16	12	5	7	34	0	0	0
Idaho	0	0	0	-------	5	4	9	0	9	0	0	0
Wyoming	0	1	1	9	-------	-------	1	4	2	0	1	0
Colorado	9	7	9	28	6	6	61	16	16	0	1	1
New Mexico	0	0	2	-------	-------	1	6	25	24	0	0	0
Arizona	3	5	5	65	112	58	74	14	3	0	0	0
Utah [3]	0	1	1	1	12	2	6	1	8	0	0	0
Nevada	0	0	-------	-------	-------	-------	0	0	-------	0	0	-------
PACIFIC												
Washington	1	7	2	3	-------	-------	3	5	9	1	0	0
Oregon	12	1	3	18	7	15	18	9	9	0	1	1
California	16	23	24	46	28	17	128	73	55	1	2	2
Total	668	521	926	1,330	856	856	1,435	1,674	1,359	32	28	49
43 weeks	[5]12,029	[5]12,218	20,576	[5]575,776	174,921	156,891	839,759	237,570	273,979	1,705	1,419	2,499

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended October 25, 1941, and comparison with corresponding week of 1940 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended		Median 1936–40	Week ended		Median 1936–40	Week ended		Median 1936–40	Week ended		Median 1936–40
	Oct. 25, 1941	Oct. 26, 1940		Oct. 25, 1941	Oct. 26, 1940		Oct. 25, 1941	Oct. 26, 1940		Oct. 25, 1941	Oct. 26, 1940	
NEW ENG.												
Maine	0	0	0	6	14	10	0	0	0	0	1	2
New Hampshire	0	0	0	2	8	3	0	0	0	1	0	0
Vermont	1	0	0	5	12	11	0	0	0	0	1	1
Massachusetts	11	0	2	108	61	73	0	0	0	6	3	1
Rhode Island	0	0	0	4	3	3	0	0	0	0	1	1
Connecticut	6	2	2	21	7	30	0	0	0	1	5	3
MID. ATL.												
New York [3]	57	12	12	107	163	176	0	0	0	14	4	14
New Jersey	15	3	3	51	66	59	0	0	0	7	1	4
Pennsylvania	16	5	5	102	111	192	0	0	0	10	7	20
E. NO. CEN.												
Ohio	17	33	7	171	156	156	0	0	0	4	5	13
Indiana	5	14	4	51	47	101	0	1	1	0	1	3
Illinois	12	38	16	135	178	209	1	13	2	7	18	18
Michigan [3]	8	45	15	122	119	178	6	0	0	4	2	7
Wisconsin	4	52	3	96	104	104	0	6	0	2	0	0
W. NO. CEN.												
Minnesota	15	13	12	31	57	77	0	0	2	1	1	1
Iowa	2	48	4	35	58	62	1	1	2	0	2	2
Missouri	2	10	3	34	44	66	0	0	0	2	8	12
North Dakota	1	2	1	6	4	16	0	0	0	0	2	1
South Dakota	1	4	2	20	23	23	0	0	0	2	1	1
Nebraska	0	7	1	6	22	22	0	1	1	0	0	0
Kansas	1	20	3	44	59	71	0	0	0	1	1	3
SO. ATL.												
Delaware	3	0	0	8	3	5	0	0	0	2	3	3
Maryland [3]	4	1	1	21	20	35	0	0	0	6	6	9
Dist. of Col	5	0	0	13	8	11	0	0	0	0	0	1
Virginia [3]	6	12	2	52	49	49	0	0	0	11	10	10
West Virginia	3	31	1	51	34	86	0	0	0	4	5	8
North Carolina [4]	5	1	1	85	128	92	0	0	0	2	3	9
South Carolina [3]	5	0	0	12	39	17	0	0	0	8	11	11
Georgia [3]	6	1	1	35	38	33	0	0	0	8	21	15
Florida	1	2	1	8	4	4	0	0	0	0	3	3
E. SO. CEN.												
Kentucky	5	13	5	78	56	73	0	0	0	12	23	13
Tennessee	22	4	4	80	81	66	0	1	0	6	7	7
Alabama [3]	12	4	3	36	40	39	1	0	0	7	11	11
Mississippi [2 3]	7	3	3	13	21	17	1	0	0	4	2	5
W. SO. CEN.												
Arkansas	3	3	3	5	7	10	0	0	0	5	7	7
Louisiana [3]	1	3	1	4	10	13	0	0	0	6	7	9
Oklahoma [4]	5	0	0	18	23	23	1	2	2	4	15	13
Texas [3]	7	2	3	30	38	48	0	1	1	14	12	14
MOUNTAIN												
Montana	2	4	0	18	11	23	0	0	9	0	0	3
Idaho	0	4	1	14	13	13	0	1	2	2	0	3
Wyoming	0	9	0	3	11	9	0	0	0	0	1	0
Colorado	2	2	2	18	26	26	0	0	3	1	5	5
New Mexico	0	0	0	6	4	14	1	0	0	1	2	8
Arizona	0	0	0	1	3	3	0	0	0	0	0	1
Utah [3]	0	7	2	8	8	11	0	0	0	1	1	0
Nevada	0	0	------	0	1	------	0	0	------	5	0	------
PACIFIC												
Washington	6	13	3	28	27	27	0	0	1	1	6	3
Oregon	5	0	1	3	13	17	2	1	1	1	7	3
California	5	7	8	97	97	152	0	0	1	5	7	9
Total	294	434	197	1,902	2,129	2,756	14	28	38	178	239	325
43 weeks	7,885	8,383	6,245	103,238	131,380	154,452	1,244	2,089	8,662	7,419	8,399	12,303

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended October 25, 1941, and comparison with corresponding week of 1940—Continued

Division and State	Whooping cough	
	Week ended—	
	Oct. 25, 1941	Oct. 26, 1940
NEW ENG.		
Maine	29	9
New Hampshire	16	13
Vermont	17	14
Massachusetts	134	142
Rhode Island	31	4
Connecticut	49	81
MID. ATL.		
New York [1]	387	405
New Jersey	173	131
Pennsylvania	219	556
E. NO. CEN.		
Ohio	152	254
Indiana	14	19
Illinois	266	192
Michigan [3]	343	322
Wisconsin	260	168
W. NO. CEN.		
Minnesota	70	52
Iowa	20	6
Missouri	22	57
North Dakota	24	27
South Dakota	0	2
Nebraska	5	9
Kansas	35	54
SO. ATL.		
Delaware	2	24
Maryland [3]	41	81
District of Columbia	14	7
Virginia [3]	43	35
West Virginia	36	25
North Carolina [4]	91	61
South Carolina [3]	38	21
SO. ATL.—continued		
Georgia [3]	3	11
Florida	9	6
E. SO. CEN.		
Kentucky	81	88
Tennessee	36	35
Alabama [3]	26	28
Mississippi [2 3]	----------	----------
W. SO. CEN.		
Arkansas	10	14
Louisiana [3]	5	7
Oklahoma [4]	5	12
Texas [3]	72	96
MOUNTAIN		
Montana	31	0
Idaho	2	8
Wyoming	9	3
Colorado	44	27
New Mexico	13	19
Arizona	3	11
Utah [3]	10	27
Nevada	1	0
PACIFIC		
Washington	63	56
Oregon	14	10
California	155	263
Total	3,123	3,492
43 weeks	177,643	134,993

[1] New York City only.

[2] Typhus fever, week ended Oct. 18, 1941, 69 cases, as follows: New York, 1; Virginia, 1; South Carolina, 3; Georgia, 27; Alabama, 10; Mississippi, 1; Louisiana, 10; Texas, 16.

[3] Period ended earlier than Saturday.

[4] Rocky Mountain spotted fever, week ended Oct. 18, 1941, 2 cases, as follows: North Carolina, 1; Oklahoma, 1.

[5] Corrected figures for Arkansas indicate 15 cases of diphtheria and 23 cases of influenza for the week ended Sept. 27, instead of 21 and 17 cases, respectively, as shown in the Public Health Reports of Oct. 3, p. 1972.

WEEKLY REPORTS FROM CITIES

City reports for week ended October 11, 1941

This table lists the reports from 131 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included 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								
Maine:											
Portland	0	------	0	0	0	3	0	0	2	2	19
New Hampshire:											
Concord	0	------	0	0	0	2	0	1	0	0	8
Nashua	0	------	0	0	0	0	0	0	0	1	7
Vermont:											
Barre	0	------	--------	0	-------	0	0	-------	0	0	--------
Burlington	0	------	0	0	0	0	0	0	0	0	10
Rutland	0	------	0	0	1	0	0	0	0	0	4
Massachusetts:											
Boston	1	------	0	2	9	19	0	2	1	19	187
Fall River	0	------	0	0	0	12	0	1	1	1	30
Springfield	0	------	0	14	0	14	0	0	1	5	35
Worcester	0	------	0	0	3	4	0	1	0	1	49
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	11
Providence	0	------	0	4	3	5	0	1	0	18	59
Connecticut:											
Bridgeport	0	1	1	0	0	0	0	0	0	1	26
Hartford	0	------	0	0	1	5	0	0	0	1	43
New Haven	0	------	0	13	1	3	0	0	1	3	33
New York:											
Buffalo	0	------	0	4	13	7	0	5	0	15	136
New York	16	3	0	17	51	30	0	78	6	158	1,354
Rochester	0	------	0	2	1	1	0	1	0	0	75
Syracuse	0	------	0	0	1	3	0	1	0	22	51
New Jersey:											
Camden	1	------	0	0	1	0	0	1	0	10	29
Newark	0	1	0	4	0	10	0	1	1	43	101
Trenton	0	------	0	1	1	5	0	4	0	0	46
Pennsylvania:											
Philadelphia	1	1	1	2	10	21	0	28	2	57	433
Pittsburgh	1	1	0	1	4	10	0	6	0	27	148
Reading	0	------	0	1	2	0	0	0	0	5	42
Scranton	0	------	--------	1	-------	0	0	-------	0	0	--------
Ohio:											
Cincinnati	0	------	1	0	1	7	0	8	0	10	144
Cleveland	0	7	2	2	2	13	0	7	6	42	163
Columbus	0	------	0	1	2	5	0	3	0	11	71
Toledo	0	------	0	0	1	1	0	4	0	19	60
Indiana:											
Anderson	0	------	0	0	1	0	0	0	0	0	15
Fort Wayne	0	------	0	0	2	0	0	0	0	0	21
Indianapolis	0	------	1	3	8	9	0	2	0	2	108
Muncie	0	------	0	0	2	1	0	0	0	1	9
South Bend	1	------	0	0	1	0	0	0	0	0	18
Terre Haute	0	------	0	0	0	0	0	2	0	0	25
Illinois:											
Alton	0	------	0	0	0	0	0	0	0	0	9
Chicago	9	6	3	7	20	33	0	21	1	108	603
Elgin	0	------	0	0	0	1	0	0	0	4	11
Moline	0	------	0	0	0	0	0	0	0	15	12
Springfield	0	------	0	0	0	0	0	0	0	0	21
Michigan:											
Detroit	1	------	0	17	6	32	0	7	1	60	219
Flint	0	------	0	0	3	1	0	0	0	4	21
Grand Rapids	0	------	1	0	1	1	0	1	1	4	38
Wisconsin:											
Kenosha	0	------	0	0	0	4	0	0	0	6	8
Madison	0	------	0	1	0	3	0	0	0	2	3
Milwaukee	0	------	0	4	10	12	0	2	0	99	97
Racine	0	------	0	0	0	1	0	0	0	1	6
Superior	0	------	0	1	0	0	0	0	0	0	7
Minnesota:											
Duluth	0	------	0	0	1	0	0	0	0	4	25
Minneapolis	0	------	0	0	2	13	0	0	1	16	86
St. Paul	0	------	0	0	2	5	0	2	0	22	50
Iowa:											
Cedar Rapids	0	------	--------	0	-------	0	0	-------	0	0	--------
Des Moines	0	------	0	0	0	2	0	0	0	1	24
Sioux City	0	------	--------	0	-------	1	0	-------	0	2	--------
Waterloo	0	------	--------	0	-------	1	0	-------	0	0	--------
Missouri:											
Kansas City	0	------	0	0	5	10	0	5	1	3	100
St. Joseph	0	------	0	9	3	1	0	0	0	0	23
St. Louis	3	------	0	1	5	8	0	8	2	5	168

City reports for week ended October 11, 1941— 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								
North Dakota:											
Fargo	0	------	0	0	0	0	0	0	0	3	8
Grand Forks	0	------	------	0	------	1	0	------	0	0	------
Minot	0	------	0	6	0	0	0	0	0	1	8
South Dakota:											
Sioux Falls	0	------	0	0	0	0	0	0	0	0	12
Nebraska:											
Lincoln	0	------	------	0	------	0	0	------	0	1	------
Omaha	0	------	0	1	1	4	0	1	0	0	47
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	0	9
Topeka	0	------	0	0	0	3	0	0	0	1	3
Wichita	1	------	0	2	1	0	0	1	0	2	27
Delaware:											
Wilmington	0	------	0	0	1	4	0	1	0	0	32
Maryland:											
Baltimore	0	1	0	8	8	15	0	12	0	34	247
Cumberland	0	------	0	0	0	2	0	0	0	0	11
Frederick	0	------	0	0	1	0	0	0	0	0	7
District of Columbia:											
Washington	2	2	0	7	5	11	0	11	0	17	121
Virginia:											
Lynchburg	2	------	0	1	0	0	0	0	1	1	6
Norfolk	2	------	0	0	1	1	0	0	0	2	19
Richmond	0	------	0	0	1	2	0	3	0	0	51
Roanoke	0	------	0	0	0	1	0	0	0	1	14
West Virginia:											
Charleston	0	1	0	0	0	0	0	0	0	2	41
Huntington	0	------	------	1	------	0	0	------	0	1	------
Wheeling	0	------	0	9	2	0	0	1	0	1	16
North Carolina:											
Gastonia	0	------	------	0	------	0	0	------	0	0	------
Raleigh	2	------	0	0	1	2	0	0	0	3	13
Wilmington	0	------	0	0	2	0	0	0	0	9	14
Winston-Salem	0	1	0	0	2	1	0	3	0	0	18
South Carolina:											
Charleston	0	4	0	0	3	0	0	1	1	0	25
Florence	0	------	0	0	0	1	0	0	0	0	7
Greenville	1	------	0	0	0	3	0	0	0	2	6
Georgia:											
Atlanta	0	3	0	0	0	8	0	5	0	0	58
Brunswick	0	------	0	0	0	0	0	0	0	0	1
Savannah	0	------	0	0	1	2	0	1	0	0	22
Florida:											
Miami	0	------	0	1	4	0	0	1	0	0	46
St. Petersburg	0	------	0	0	2	0	0	0	0	0	15
Kentucky:											
Ashland	1	------	0	0	0	0	0	0	0	1	4
Covington	1	------	0	0	2	3	0	0	0	0	11
Lexington	0	------	0	0	0	0	0	0	0	2	11
Tennessee:											
Knoxville	1	------	0	0	1	1	0	2	0	0	23
Memphis	1	------	0	1	0	0	0	1	0	10	68
Nashville	0	------	0	0	3	3	0	2	0	13	44
Alabama:											
Birmingham	0	2	1	2	1	6	0	6	1	1	71
Mobile	0	------	0	0	0	0	0	0	0	0	28
Montgomery	1	------	------	0	------	3	0	------	0	0	------
Arkansas:											
Fort Smith	1	------	------	0	------	2	0	------	0	0	------
Little Rock	0	------	0	0	2	0	0	1	0	0	24
Louisiana:											
Lake Charles	0	------	0	0	0	0	0	1	0	0	2
New Orleans	3	1	0	0	11	3	0	4	2	3	133
Shreveport	2	------	0	0	3	2	0	4	0	0	40
Oklahoma:											
Oklahoma City	0	------	0	0	3	1	0	2	0	0	45
Tulsa	2	------	0	8	0	1	0	0	0	0	20
Texas:											
Dallas	4	------	0	1	0	6	0	2	1	5	54
Fort Worth	5	------	0	0	1	2	0	1	1	6	22
Galveston	0	------	0	0	1	0	0	1	0	0	14
Houston	0	------	0	0	3	2	0	2	0	1	79
San Antonio	0	------	0	0	4	1	0	5	0	0	48

City reports for week ended October 11, 1941—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								
Montana:											
Billings	0	------	0	0	0	0	0	0	0	0	8
Great Falls	0	------	0	0	1	0	0	0	0	1	8
Helena	0	------	0	1	0	0	0	0	0	0	4
Missoula	0	------	0	0	3	0	0	0	0	0	10
Colorado:											
Colorado Springs	0	------	0	0	1	4	0	0	1	5	14
Denver	2	19	0	4	5	1	0	9	0	26	97
Pueblo	0	------	0	8	1	2	0	0	0	0	7
New Mexico:											
Albuquerque	0	------	0	1	0	1	0	1	0	0	9
Arizona:											
Phoenix	0	1	--------	2	-------	0	0	-------	0	1	--------
Utah:											
Salt Lake City	0	------	0	2	1	2	0	0	0	7	32
Washington:											
Seattle	1	------	0	1	4	5	0	0	1	11	80
Spokane	0	------	0	0	3	2	0	0	0	4	30
Tacoma	0	------	0	0	0	1	0	0	0	2	17
Oregon:											
Portland	0	------	0	1	3	2	0	0	0	2	97
Salem	0	------	--------	0	-------	0	0	-------	0	0	--------
California:											
Los Angeles	0	3	2	5	5	14	0	21	3	34	372
Sacramento	3	------	0	0	2	0	0	2	0	2	46
San Francisco	0	7	0	2	5	3	0	9	0	11	134

State and city	Meningitis, meningococcus		Poliomyelitis cases	State and city	Meningitis, meningococcus		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Maine:				North Dakota:			
Portland	0	0	2	Fargo	0	0	1
New Hampshire:				Delaware:			
Concord	0	0	1	Wilmington	0	0	2
Massachusetts:				Maryland:			
Boston	3	1	2	Baltimore	2	0	2
Fall River	0	0	1	District of Columbia:			
Rhode Island:				Washington	0	0	3
Providence	0	0	1	Virginia:			
Connecticut:				Norfolk	0	0	2
Bridgeport	0	0	1	Richmond	1	0	0
New York:				South Carolina:			
New York	1	1	24	Charleston	1	0	0
Rochester	0	0	7	Greenville	1	0	0
Syracuse	0	0	3	Georgia:			
New Jersey:				Atlanta	0	0	1
Newark	0	0	1	Tennessee:			
Pennsylvania:				Knoxville	0	0	1
Philadelphia	1	1	4	Nashville	0	0	5
Pittsburgh	0	0	1	Alabama:			
Scranton	0	0	1	Birmingham	0	0	2
Ohio:				Montgomery	0	0	2
Cincinnati	0	0	1	Louisiana:			
Cleveland	0	0	8	New Orleans	0	0	3
Illinois:				Texas:			
Chicago	1	0	15	Fort Worth	0	0	1
Michigan:				Houston	0	1	0
Detroit	0	0	6	San Antonio	0	0	2
Grand Rapids	0	0	1	Utah:			
Minnesota:				Salt Lake City	0	0	2
Duluth	0	0	2	Washington:			
Minneapolis	0	0	1	Seattle	0	0	4
St. Paul	0	0	13	California:			
Missouri:				Los Angeles	0	0	2
St. Louis	1	0	0	San Francisco	0	0	1

Encephalitis, epidemic or lethargic.—Cases: Minneapolis, 1; Denver, 1. Deaths: Duluth, 1; Minneapolis, 1; Omaha, 2.

Pellagra.—Cases: Savannah, 7; New Orleans, 2; Oklahoma City, 1; Phoenix, 2.

Typhus fever.—Cases: Norfolk, 1; Winston-Salem, 1; Atlanta, 2; Savannah, 1; Miami, 2; Memphis, 1; Birmingham, 1; Mobile, 1; New Orleans, 6; Fort Worth, 4; Houston, 1. Deaths: Miami, 1.

Rates (annual basis) per 100,000 population for a group of 88 selected cities (population, 1940, 33,794,591)

Period	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet-fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases
		Cases	Deaths							
Week ended Oct. 11, 1941	8.79	9.87	2.01	25.46	40.42	64.34	0.00	47.37	5.86	222.03
Average for week, 1936–40	19.80	9.67	3.12	42.42	56.29	81.46	0.47	49.43	7.49	147.67

PLAGUE INFECTION IN FLEAS FROM GROUND SQUIRRELS AND CHIPMUNKS IN SISKIYOU COUNTY, CALIF.

Under date of October 16, 1941, Dr. Bertram P. Brown, Director of Public Health of California, reported plague infection proved, by animal inoculation and cultures, in a pool of 4 fleas from 12 chipmunks shot September 5 in Shasta National Forest, 5 miles east and 1 mile north of Mount Shasta City, and in 3 pools of fleas from ground squirrels, *C. douglasii*, as follows: In a pool of 103 fleas from 4 ground squirrels submitted to the laboratory on September 3 from a ranch 1½ miles east of Yreka; in a pool of 86 fleas from 5 ground squirrels shot September 3 at a ranch 4 miles north of Montague; in a pool of 100 fleas from 5 ground squirrels submitted to the laboratory on September 13 from property of the Southern Pacific Railway inside the city limits of Mount Shasta City. All of the localities are in Siskiyou County, Calif.

TERRITORIES AND POSSESSIONS

HAWAII TERRITORY

Plague (rodent).—A rat found on September 26, 1941, in Paauhau, Hamakua District, Island of Hawaii, T. H., has been proved positive for plague.

FOREIGN REPORTS

BERMUDA

Dengue—Influenza.—According to information received through official sources from the American Consul at Hamilton, Bermuda, under date of October 29, 1941, the medical officer of health of Bermuda reported 92 cases of dengue fever and 58 cases of influenza. It was stated that the type of dengue fever was causing the medical officers some concern and that the Colonial Secretary had requested aid from the Rockefeller Institute in New York.

CANADA

Provinces—Communicable diseases—Week ended September 20, 1941.—During the week ended September 20, 1941, 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	3					13
Chickenpox		5		22	59	10	5		22	114
Diphtheria		10	2	42	1	2				57
Dysentery				4	1					5
Influenza		11				1			3	15
Lethargic encephalitis						1	[1] 42	1		44
Measles			2	212	19	6	2	1	46	288
Mumps				82	38	15	8	2	27	172
Pneumonia	4	12			1				1	18
Poliomyelitis		1	27	10	3	28	7	16	6	98
Scarlet fever		10	4	63	90	10	7	7	16	207
Trachoma								1		1
Tuberculosis	2	5	6	63	56	2	19	2		155
Typhoid and paratyphoid fever		7	4	11	5	1	9	2	4	43
Whooping cough	3	5	2	123	141		5	3	6	288

[1] Encephalomyelitis.

Manitoba—Winnipeg—Poliomyelitis.—From the week ended June 21 to the week ended September 27, 1941, a total of 247 cases of poliomyelitis was reported in Winnipeg. Most of the cases occurred in children. Approximately 1 in 3 (87, or 35 percent) developed some degree of paralysis, while 7 died (a case fatality rate of about 3 percent). The incidence rate for the period of the epidemic is given as 105 per 100,000 population.

CUBA

Provinces—Notifiable diseases—4 weeks ended September 13, 1941.—During the 4 weeks ended September 13, 1941, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1		2	9		8	20
Chickenpox						1	1
Diphtheria		12	1	3		3	19
Hookworm disease		36		1			37
Leprosy		2					2
Malaria	144	17		51	2	39	253
Measles		5	1	2	1		9
Poliomyelitis		2				1	3
Tuberculosis	9	33	17	75	25	45	204
Typhoid fever	24	52	14	45	12	24	171
Undulant fever				1			1
Whooping cough				2			2
Yaws						4	4

[1] Includes the city of Habana.

ITALY

Notifiable diseases—1939–40.—During the years 1939 and 1940 cases of certain notifiable diseases were reported in Italy as follows:

Disease	1939	1940	Disease	1939	1940
Anthrax	890	710	Mumps	10,279	18,190
Cerebrospinal meningitis	1,451	3,023	Paratyphoid fever	4,271	4,797
Chickenpox	16,136	15,946	Pellagra	699	540
Diphtheria	28,478	26,354	Poliomyelitis	6,007	2,407
Dysentery (amoebic)	937	893	Puerperal fever	1,359	1,080
Dysentery (bacillary)	645	1,191	Scarlet fever	12,185	11,010
German measles	58,619	59,954	Smallpox	4	
Hookworm disease	2,003	1,708	Syphilis	621	918
Influenza	66,885	16,881	Typhoid fever	25,981	26,103
Leprosy	24	32	Undulant fever	4,627	4,615
Lethargic encephalitis	69	81	Whooping cough	22,025	24,881
Malaria	55,453	60,708			

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

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

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–July 1941	August 1941	September 1941—week ended—			
				6	13	20	27
ASIA							
Ceylon	C		1				
China:							
Canton	C	329	77			4	
Hong Kong	C	1,303	244	27			
Macao	C	541	239	126		75	106
Shanghai	C	[1] 36	450		83	40	28
India:							
Bombay	C	[2] 11					
Calcutta	C	1,826					
Rangoon	C	69	6				
India (French)	C	34					
Japan: Taiwan	C	2					

[1] For July.

[2] For 2 weeks only.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE

[C indicates cases]

Place		January–July 1941	August 1941	September 1941—week ended—			
				6	13	20	27
AFRICA							
Belgian Congo	C	6					
British East Africa:							
Kenya	C	138					
Uganda	C	73					
Egypt: Port Said	C	8					
Madagascar	C	194	8	2		3	
Morocco	C	1,762	244	22	14	11	12
Casablanca.[1]							
Tunisia: Tunis	C	2					
Union of South Africa	C	68					
ASIA							
China: Foochow	C	3					
Dutch East Indies:							
Java and Madura	C	396					
West Java	C	292					
India:							
Calcutta	C	3					
Rangoon	C	6					
Indochina (French)	C	18	1	2			1
Palestine: Haifa	C	2					
Plague-infected rats		10					
Thailand: Lampang Province	C	1					
EUROPE							
Portugal: Azores Islands	C		1				
NORTH AMERICA							
Canada—Alberta—Plague-infected ground squirrel		1					
SOUTH AMERICA							
Argentina:							
Cordoba Province	C	[2] 21					
Santa Fe Province—Plague-infected rats		67					
Chile: Valparaiso.[3]							
Ecuador	C	33					
Peru:							
Ancash Department	C	1					
Lambayeque Department	C	2					
Libertad Department	C	6					
Lima Department	C	6	2				
Moquegua Department—Ilo	C	7					
Piura Department	C	2					
OCEANIA							
Hawaii Territory: [4] Plague-infected rats		47	1	1	1	1	1
New Caledonia	C	9					

[1] A report dated June 23, 1941, stated that an outbreak of plague had occurred in Casablanca, Morocco, where several deaths had been reported.
[2] Includes 3 cases of pneumonic plague.
[3] A report dated October 13, states that 1 case of plague occurred in Valparaiso, Chile.
[4] During April and May, 4 lots of plague-infected fleas were reported in Hawaii Territory.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases]

Place		January–July 1941	August 1941	September 1941—week ended—			
				6	13	20	27
AFRICA							
Algeria	C	220	91	11	------	36	------
Angola	C	[1] 29	------	------	------	------	------
Belgian Congo	C	333	------	------	------	------	------
British East Africa	C	22	------	------	------	------	------
Dahomey	C	464	------	------	------	------	------
French Guinea	C	45	------	------	------	------	------
Ivory Coast	C	39	------	------	------	------	------
Morocco	C	155	------	------	------	------	------
Nigeria	C	677	------	------	------	------	------
Niger Territory	C	258	6	------	------	------	------
Portuguese East Africa	C	9	------	------	------	------	------
Rhodesia: Southern	C	86	------	------	------	------	------
Senegal	C	56	------	------	------	------	------
Sierra Leone	C	15	------	------	------	------	------
Sudan (Anglo-Egyptian)	C	7	------	------	------	------	------
Sudan (French)	C	19	------	------	------	------	------
Union of South Africa	C	370	------	------	------	------	------
ASIA							
Ceylon	C	108	6	------	------	------	------
China	C	237	6	------	------	1	------
Chosen	C	696	------	------	------	------	------
Dutch East Indies—Bali Island	C	3	------	------	------	------	------
India	C	11,898	------	------	------	------	------
India (French)	C	9	------	------	------	------	------
India (Portuguese)	C	70	------	------	------	------	------
Indochina (French)	C	895	43	------	------	------	[2] 96
Iran	C	8	------	------	------	------	------
Iraq	C	1,036	24	19	------	------	------
Japan	C	200	------	------	------	------	------
Straits Settlements	C	1	------	------	------	------	------
Syria	C	1	------	------	------	------	------
Thailand	C	234	------	------	------	------	------
EUROPE							
France	C	1	------	------	------	------	------
Portugal	C	31	3	1	------	------	------
Spain	C	186	53	13	13	13	------
NORTH AMERICA							
Canada	C	22	1	------	------	------	------
Dominican Republic	C	2	------	------	------	------	------
Guatemala	C	5	------	------	------	------	------
Mexico	C	27	------	------	------	------	------
SOUTH AMERICA							
Bolivia	C	[3] 18	------	------	------	------	------
Brazil	C	1	------	------	------	------	------
Colombia	C	527	2	------	------	------	------
Paraguay	C	[2] 8	------	------	------	------	------
Peru	C	778	------	------	------	------	------
Uruguay	C	7	------	------	------	------	------
Venezuela (alastrim)	C	163	18	------	10	------	------

[1] For June.
[2] For September.
[3] For January, February, and March.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases]

Place		January–July 1941	August 1941	September 1941—week ended—			
				6	13	20	27
AFRICA							
Algeria	C	8,894	647	102	------	50	------
British East Africa: Kenya	C	[1] 2	------	------	------	------	------
Egypt	C	4,581	------	------	------	------	------
Morocco	C	770	88	5	7	7	7
Sierra Leone	C	5	------	------	------	------	------
Tunisia	C	4,358	435	34	62	53	16
Union of South Africa	C	274	------	------	------	------	------
ASIA							
China	C	198	24	1	------	------	------
Chosen	C	397	------	------	------	------	------
Iran	C	105	------	------	------	------	------
Iraq	C	36	3	------	------	------	------
Japan	C	840	------	------	------	------	------
Malaya: Unfederated States	C	------	1	------	------	------	------
Palestine	C	41	------	------	------	------	------
Straits Settlements	C	6	1	------	------	------	------
Trans-Jordan	C	6	------	------	------	------	------
EUROPE							
Bulgaria	C	214	8	------	2	------	------
France (unoccupied zone)	C	[2] 2	------	------	------	------	------
Germany	C	1,406	125	27	45	56	------
Gibraltar	C	2	------	------	------	------	------
Greece	C	7	------	------	------	------	------
Hungary	C	355	15	------	17	21	------
Irish Free State	C	26	------	------	------	------	------
Poland	C	700	5	------	------	------	------
Portugal	C	5	------	------	------	------	------
Rumania	C	687	31	------	2	16	11
Spain	C	[3] 8,906	------	73	48	37	------
Switzerland	C	5	------	------	------	------	------
Turkey	C	623	------	------	------	------	------
Yugoslavia	C	78	------	------	------	------	------
NORTH AMERICA							
Guatemala	C	125	20	------	------	------	------
Mexico	C	95	------	------	------	------	------
Panama Canal Zone	C	3	------	------	------	------	------
Puerto Rico	C	[4] 3	------	------	1	------	------
SOUTH AMERICA							
Bolivia	C	75	------	------	------	------	------
Brazil	C	1	------	------	------	------	------
Chile	C	120	------	------	------	------	------
Colombia	C	[5] 1	------	------	------	------	------
Ecuador	C	65	30	------	------	------	------
Peru	C	1,079	------	------	------	------	------
Venezuela	C	35	3	------	------	------	------
OCEANIA							
Australia	C	11	1	------	------	------	------
Hawaii Territory	C	17	3	------	7	5	2

[1] For April.
[2] For June.
[3] For the period January to August inclusive.
[4] For July.
[5] For January, February, and March.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January–July 1941	August 1941	September 1941—week ended—			
				6	13	20	27
AFRICA							
Belgian Congo:							
Kimvulu	C	1					
Libengo	C	1					
French Equatorial Africa:							
Gabon	C	2					
Mayumba	C	4					
Gold Coast: Accra	C	1					
Ivory Coast [1]	C	[2] 4	1				
Nigeria	C		[3] 1				
Spanish Guinea	D	4					
SOUTH AMERICA [4]							
Brazil:							
Amazonas State	D	2					
Bahia State	D	2					
Para State	D	2	1				
Colombia:							
Antioquia Department	D	2					
Boyaca Department	D	8					
Intendencia of Meta	D	4	1	1			
Santander Department	D	5	7				
Tolima Department	D	1					
Peru: Junin Department	C	5					
Venezuela: Bolivar State	C		1				

[1] During the week ended October 11, 1 death from yellow fever was reported in Bouake, Ivory Coast.
[2] Includes 2 suspected cases.
[3] Suspected.
[4] All yellow fever reported in South America is of the jungle type unless otherwise specified.

COURT DECISION ON PUBLIC HEALTH

Possession of unwholesome poultry held violative of sanitary code.—(New York Court of Appeals; *People* v. *Swift & Co.*, 35 N.E.2d 652; decided June 12, 1941.) In November 1939, inspectors of the New York City Health Department made a routine visit to a place of business maintained by the defendant company in Brooklyn. After finding the food on the main floor, the salesroom, to be in satisfactory condition, they went to the cooler in the basement where poultry was kept awaiting removal to the salesroom and there found at least twenty-two pieces of poultry, weighing approximately 120 pounds, which were unwholesome. This poultry had not undergone all of the three inspections which the defendant conducted before selling or offering for sale.

The witnesses for the defendant testified that poultry was inspected when it was delivered to the defendant and again when it was sent from the basement cooling room to the main floor for sale. Both of these inspections were merely on a sampling basis, that being the custom of the trade. Three to five boxes were examined out of a lot which might range from twenty-five to four hundred boxes, the examination consisting of removing the top cover of the box and looking at the breast of the chicken. Only if the breast revealed a condition which aroused suspicion did the examination go beyond this. Mold on the backs or sides of the poultry would escape detection. The defendant explained that the unwholesome condition of the poultry condemned escaped its attention because the mold was on the so-called hips of the chickens. The third and last inspection was made by the customer at the time that he bought the poultry, this inspection involving the opening of all boxes. However, at times—although the defendant insisted that such occasions were rare—this final examination was omitted and, according to the court, apparently depended entirely upon the wishes of the customer, when present, rather than the protection of the public.

The city sanitary code provided, among other things, that no poultry which was not healthy, wholesome, or safe for human food, or that died by disease or accident, should be brought into the city or held, kept, offered for sale, or sold as food (sec. 163). There were other provisions that food in the possession of a dealer in food should, prima facie, be deemed to be held, kept, or offered for sale as food (sec. 138), that the presence of food in any part of the establishment should be deemed prima facie evidence of its use for human food (sec. 148, reg. 23), and that food which had become unfit for human consumption should be kept separate from other foodstuffs which were held, kept, and offered for sale, marked "condemned," and removed daily (sec. 148, reg. 27).

In the trial court there had been a judgment of conviction for violation of section 163 of the sanitary code. The appellate division of the State supreme court had reversed this judgment, dismissed the information, and remitted the fine.[1] On appeal by the people the court of appeals said that the trial court had pointed out that the inspections employed were inadequate to reveal unwholesomeness, while the appellate division had reversed upon the ground that, while it was true that the poultry was intended to be sold, it was also equally true that it was not to be sold if it had been found by the defendant or the customer to be unwholesome. The question presented to the court of appeals was whether a judgment of conviction for the possession for sale of decomposed and unhealthy food kept in a storeroom from which salesmen replenished stock for sale in New York City could be reversed solely on the ground that the defendant had acted in good faith.

In concluding that the order of the appellate division should be reversed and the judgment of the trial court affirmed, it was stated that the method of inspection employed by the defendant would not necessarily have revealed the unhealthy condition of the poultry and that in such case there was a violation by the mere holding for sale of the food upon the premises even though it might be that a buyer would inspect before buying or that the poultry would be reinspected by the defendant. "We have here, therefore, a clear violation of the sanitary code, secs. 163, 138, 148, reg. 27." The concluding portion of the opinion read as follows:

> The danger to human life and health from unwholesome food is so great that the courts generally have treated food differently from most other products. It has been placed in the same category as drugs, poisons, and other instrumentalities which, if they are negligently dealt with, are ordinarily certain to affect seriously the public health and safety. The good intentions of the defendant would matter very little to consumers who might consume this poultry. Food laws are designed primarily, not for the punishment of the dealer, but for the protection of the consumer. In this field of law, the obligation to beware is on the seller rather than the buyer. Lack of proof of guilty intent does not satisfy that obligation.

[1] See Public Health Reports, April 18, 1941, p. 858.

×