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STUDIES ON OXYURIASIS

XIV. CONTROLLED TESTS WITH VARIOUS METHODS OF THERAPY

By WILLARD H. WRIGHT, *Chief*, FREDERICK J. BRADY, *Passed Assistant Surgeon*, and JOHN BOZICEVICH, *Associate Zoologist, Division of Zoology, National Institute of Health, United States Public Health Service*

This paper represents a further report of the results of experiments designed to develop a satisfactory treatment for oxyuriasis and includes observations on the use of santonin, various preparations of hexylresorcinol, anal ointments, and nonmedicated enemas. The second and fourth papers in this series presented the results of tetrachlorethylene treatment and the eighth paper presented a preliminary report on the use of gentian violet. [1]

The difficulty of eradicating pinworm infection is reflected by the many methods recommended in the literature for the treatment of this condition. However, in our experiments we have endeavored to select for test only those drugs and methods of therapy which seemed most promising from the standpoint of the life cycle of the parasite (*Enterobius vermicularis*) and the location of its various stages within the intestine of the host. In this connection, Wright and Cram (*1*) have reviewed the theoretical considerations involved in the treatment of oxyuriasis and have outlined certain basic principles. One of these principles rests on the fact that pinworm infection is usually a familial condition involving several or all members of the family. In view of this fact, it appears futile from a control standpoint to treat some, but not all, infected individuals in a household, since treated individuals usually become reinfected promptly through ova scattered by nontreated individuals. Consequently, in all of the experiments reported in this paper, diagnostic tests were carried out on all members of each family represented and all infected individuals were treated simultaneously.

Diagnosis was made in all cases by means of the NIH cellophane swab described by Hall (*2*). The efficacy of the treatment was checked by the use of the same swab, it being our goal to obtain seven consecutive daily post-treatment swabs from each case. However, in some cases it was not possible to obtain this number of post-treat-

[1] See list of other papers in this series under References.

ment checks. Cram, Jones, Reardon, and Nolan (*3*) have shown that six NIH swab examinations will detect the great majority of pinworm infections and Sawitz, Odom, and Lincicome (*4*) found that seven swab examinations disclosed over 99 percent of the total infections in their series of cases. It was intended that the patients should use the post-treatment swabs beginning with the fourteenth day or later after termination of the treatment. However, in many cases instructions were not followed to the letter. The reason for selecting this time interval for taking the post-treatment checks has been discussed in detail in a previous paper (*5*) and is based on such facts as are known concerning the life cycle of the parasite.

All of the patients represented in these tests were treated as outpatients, most of them through a clinic for parasitic diseases maintained at Providence Hospital, Washington, D. C.

TESTS WITH SANTONIN

Results obtained in the treatment of 20 cases of oxyuriasis with santonin are given in table 1. Each patient received a single dose of the drug daily over a period of 10 days. The dose rate, as indicated in the table, was based on the age and physical condition of the patient at the time of treatment. Children were treated on the basis of the apparent rather than the chronological age. Since most of the children were undernourished and poorly developed, the dose of the drug in most cases was relatively small.

TABLE 1.—*Results of treatment of cases of oxyuriasis with santonin administered in a single dose daily over a period of 10 days*

Patient	Age	Daily dose for 10 days (grains)	Number of post-treatment swabs	Interval, in days, between end of treatment and first post-treatment swab	Results of post-treatment swab examinations
C. A.	14	¼	3	15	Negative.
K. A.	11	¼	3	15	Do.
J. C.	53	1	7	12	Do.
Mrs. J. C.	49	1	7	13	Do.
A. I.	8	¼	6	27	Do.
Mrs. A. S.	(1)	1	7	10	Do.
Mrs. C. A.	(1)	1	5	13	Do.
Mr. G. A.	(1)	1	5	13	Do.
C. C. A.	11	¼	5	13	Do.
A. A.	8	¼	5	13	Do.
R. A.	5	¼	5	13	Do.
W. R.	9	¼	3	11	Positive.
B. R.	6	¼	3	11	Do.
M. R.	12	½	3	11	Do.
Mrs. A. R.	(1)	1	3	11	Do.
M. S.	8	¼	7	10	Do.
J. H. A.	15	½	5	13	Do.
G. A., Jr.	13	¼	5	13	Do.
J. S.	17	1	3	7	Do.
I. W.	14	1	3	14	Do.

[1] Adult.

Eleven cases were found to be negative on post-treatment swabs. However, only 3 of these cases had 7 post-treatment checks; 1 had 6 swabs; 5 had 5 swabs each; and 2 had only 3 swabs each. There are grave doubts concerning the freedom from infection following the treatment of the patients who furnished only 3 post-treatment swabs. Most of those from whom 5 swabs were obtained were probably free from pinworms after treatment, although 2 additional swabs on these individuals might have disclosed some positive cases. Based on the evidence mentioned above, those patients who furnished 6 or 7 post-treatment swabs may reasonably be regarded as free from infection following the treatment.

Nine individuals were positive on post-treatment swabs. Thus, under the most favorable interpretation of the results, the efficacy of the treatment was at the rate of only 55 percent, and probably the actual efficacy was less than 50 percent, if due allowance is made for the insufficient number of post-treatment swabs on several of the so-called negative individuals. In spite of the fact that santonin has long been recommended as a treatment for pinworm infection, in these tests it was relatively ineffective for that purpose. From these results, the drug would certainly be unsatisfactory for the treatment of familial pinworm infections, since it would leave too many individuals still harboring pinworms the ova from which would probably cause reinfections in those few members of the family freed of infection by the treatment.

TESTS WITH HEXYLRESORCINOL [2]

Brown (*6*), who was the first to use hexylresorcinol in the treatment of oxyuriasis, reported cures in 5 cases following the administration of the drug orally and in a 1:1,000 suspension in enemas over periods varying from 2 to 13 weeks, and cures in 2 patients given hexylresorcinol enemas alone. However, Brown was unsuccessful in attempts to clear up infections by the oral administration of single doses of the drug.

More recently, Spaak (*7*) recommended the hospitalization of patients for 3 days and the use of hexylresorcinol over a period of 2 days, the patient receiving a purgative on the first day, hexylresorcinol both orally and by enema on the second day, and by enema only on the third day. This treatment is repeated in 14 days.

Craig and Faust (*8*) advised giving hexylresorcinol orally in the morning and by enema in the evening of the same day, this course of treatment to be repeated two or three times.

[2] The hexylresorcinol used in these tests was furnished through the courtesy of Sharp and Dohme, Inc., Philadelphia, Pa.

TABLE 2.—*Results of treatment of cases of oxyuriasis with enemas of hexylresorcinol in a dilution of 1:2,000 in water*

Patient	Age	Interval of treatment period, in days; enemas administered on days indicated																										Number of post-treatment swabs	Interval, in days, between end of treatment and first post-treatment swab	Results of post-treatment swab examinations
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27			
B. R.	6	X					X														X				X				5	7	Negative.
L. R.	4	X					X														X				X				5	7	Do.
E. R.	3	X					X														X				X				5	7	Do.
Mrs. S. T.	(1)	X		X		X		X		X		X			X			X				X							6	10	Do.
J. S., Jr.	3	X			X			X			X			X			X												7	14	Do.
P. S.[2]	5	X			X			X			X			X			X												7	16	Do.
B. T.	6	X				X			X							X													3	13	Do.
P. T.	4	X				X			X							X													3	13	Do.
Mrs. P.	(1)	X			X			X			X			X		X													7	12	Do.
Mrs. D.	(1)	X		X		X		X		X		X		X		X		X		X		X		X					6	35	Do.
Mrs. C. H.	(1)	X		X		X		X		X		X			X			X			X		X						14	43	Do.
J. H.	7	X		X		X		X		X		X			X		X			X			X						7	21	Do.
S. K.	6	X		X		X		X		X		X		X			X			X			X						3	7	Do.
M. J.	(2)	X		X		X		X		X		X			X			X			X			X					9	32	Do.
Mrs. S. R.	(1)	X			X			X			X																		3	1	Do.
B. R.	6	X		X		X		X		X		X		X		X			X			X							7	44	Do.
L. R.	4	X		X		X		X		X		X		X		X			X			X							7	44	Do.
E. R.	3	X		X		X		X		X		X		X		X			X			X							7	44	Do.
P. S.	5	X			X			X			X			X			X												7	14	Positive.
G. C.[3]	9	X			X				X			X																	14	7	Do.
L. C.[3]	7	X			X				X			X																	14	7	Do.
D. C.[3]	4	X			X				X			X																	14	7	Do.
A. C.[3]	6	X			X				X			X																	14	7	Do.
M. A.	7	X		X		X			X			X			X			X			X		X						7	18	Do.
Mrs. T.	70	X		X		X		X		X		X		X		X		X		X		X		X					(4)	(4)	Do.
M. S.	14	X		X		X		X		X		X		X			X			X			X			X		X	5	(?)	Do.
D. R.	3	X			X			X			X																		3	1	Do.

[1] Adult.
[2] Hexylresorcinol jelly 1:1,000 used on nights when enemas were not given.
[3] 22 months.
[4] No swabs; continued migrations.

We have used hexylresorcinol in various ways, i. e., in enemas alone, in single doses orally, in repeated doses orally together with enemas, and in the form of a rectal jelly in a dilution of 1:1,000 in a water-soluble base both with and without enema treatment. The number of treatments and the interval between treatments have varied considerably for the reason that many of our tests were in the nature of preliminary trials designed to ascertain the minimum number of treatments needed to effect cures. As earlier attempts disclosed the ineffectiveness of relatively few treatments, we increased the number of treatments as appeared indicated. Relatively few patients were treated with certain methods, since a few tests were sufficient to demonstrate the ineffectiveness of the method.

Hexylresorcinol enemas.—In table 2 are presented the results of the treatment of 27 cases of oxyuriasis with hexylresorcinol enemas. Treatment instructions called for the use of a preliminary soapsuds enema, the expulsion of which was to be followed by an enema consisting of a 1:2,000 solution of hexylresorcinol in water. One quart of this solution was recommended for adults and as much as could be retained for children. The 1:2,000 solution was much more convenient for use by outpatients than was a 1:1,000 suspension, as recommended by Brown (*6*). Since the water-solubility of the drug is approximately 1:2,000, the patient was given a suitable number of vials, each containing 0.5 gram of the drug, with instructions to dissolve the contents of one vial in one quart of water. All enemas were to be taken at bedtime.

Nine of the 27 cases were positive and 18 negative on post-treatment swab examinations. We were unsuccessful in securing an adequate number of post-treatment checks in all cases. Of the negative patients, 1 furnished 14 swabs, 1 furnished 9 swabs, 7 furnished 7 swabs each, 2 furnished 6 swabs each, 3 furnished 5 swabs each, and 4 furnished only 3 swabs each. As stated previously, those patients on whom 6 or more negative post-treatment swabs were obtained may reasonably be considered as free from pinworms. Most of those having 5 negative swabs were probably free from pinworms, but those having only 3 negative swabs were doubtfully negative. Three of the patients, B. R., L. R., and E. R., each of whom received 4 enemas over a period of 24 days followed by negative swabs, had additional migrations several months later and were re-treated.

Five of the 9 positive cases received a total of only 4 enemas each, a number admittedly inadequate to eradicate most pinworm infections. Considering the multiple factors involved in attempting an appraisal of these experimental results, we are of the opinion that the data show hexylresorcinol enemas to be of definite value if used in repeated treatments over a sufficient period of time. For satisfactory results in most cases, it would appear that the use of at least 10 enemas

spaced over a period of 3 weeks is necessary; no doubt more consistent results would follow the application of more treatments over a longer period of time, since 2 of our patients who received 12 enemas were still positive following the treatment. The use of 1 ounce of 1:1,000 hexylresorcinol jelly inserted into the rectum at bedtime on the nights on which enemas were not given probably did not add materially to the efficacy of the treatment.

It is possible that better results might have been secured had we administered hexylresorcinol orally one or more times during the period of treatment with enemas. However, this was not done because of our inability to supervise the treatments closely. Many of the patients were of fairly low intelligence and the simpler the treatment the more likelihood that it would be carried out.

TABLE 3.—*Results of treatment of cases of oxyuriasis with hexylresorcinol (Caprokol) in a single dose orally*

Patient	Age	Dose of drug (grams)	Number of post-treatment swabs	Interval, in days, between end of treatment and first post-treatment swab	Results of post-treatment swab examinations
R. A.	5	0.4	5	17	Positive.
A. A.	8	.6	5	17	Do.
G. A.	13	.8	5	17	Do.
J. A.	15	.8	5	17	Do.

Hexylresorcinol in single doses orally.—Table 3 shows the results of the treatment of 4 cases of oxyuriasis with hexylresorcinol (Caprokol) in single doses orally. The Caprokol pills were administered at the dose rate and in the manner usually recommended. The patients received a light supper the evening before treatment, were given the Caprokol pills with a glass of water on an empty stomach the following morning, and were not allowed food until 4 hours later. A saline purgative was administered 24 hours after treatment.

All 4 of the patients treated in this manner were positive for pinworm ova on the post-treatment swab examinations. It is apparent that single oral doses of Caprokol are not dependably effective for the removal of pinworms.

Hexylresorcinol orally and by enema.—Table 4 records the findings in 3 patients treated with hexylresorcinol orally and by enema. One patient, J. S., was infected with both ascarids and pinworms and was negative for the ova of both parasites after a single dose of Caprokol followed by 4 hexylresorcinol enemas administered at 3-day intervals. Two other patients, treated in accordance with the above-mentioned recommendations of Craig and Faust (*8*), were positive for pinworms on post-treatment swab examinations.

TABLE 4.—*Results of treatment of cases of oxyuriasis with hexylresorcinol orally and by enema in a dilution of 1:2,000 in water*

Patient	Age	Oral dose of drug (grams)	Number of oral doses	Number of enemas	Number of post-treatment swabs	Interval, in days, between end of treatment and first post-treatment swab	Results of post-treatment swab examinations
J. S.	5	0.4	1	[1]4	6	1	Negative.
B. C.	5	.4	[2]3	[2]3	7	8	Positive.
G. C.	8	.8	[2]3	[2]3	7	8	Do.

[1] Administered at 3-day intervals.
[2] Administered at weekly intervals.

It is our impression from these results and those recorded in table 3 that the oral administration of hexylresorcinol in the form of Caprokol pills does not constitute an effective treatment for oxyuriasis even when the oral dose of the drug is supplemented by an enema and repeated weekly for a period of 3 weeks. However, relatively few patients were included in this series and it is possible that additional tests might give more promising results, although we did not feel that our results were sufficiently encouraging to warrant a continuation of the tests.

TABLE 5.—*Results of treatment of cases of oxyuriasis with 1 ounce of 1:1,000 hexylresorcinol (Caprokol) jelly in a water-soluble base inserted into rectum at bedtime*

Patient	Age	Number of treatments administered	Period of treatment (days)	Number of post-treatment swabs	Interval, in days, between end of treatment and first post-treatment swab	Results of post-treatment swab examinations
N. McN.	2½	21	21	7	9	Negative.
M. J. A.	5	7	[1]13	3	22	Do.
A. K.	1½	10	10	6	(?)	Positive.
B. J. T.	3	7	7	4	10	Do.
B. J. T.	3	10	10	7	10	Do.
N. McN.	4	21	21	7	9	Do.
M. P. A.	7	7	[1]13	3	22	Do.
R. H. W.	12	33	38	33	1	Do.

[1] Soapsuds enema given on nights on which jelly was not used.

Hexylresorcinol jelly.—Eight patients were treated with hexylresorcinol jelly without supplementary therapy. The results of these tests are recorded in table 5. Approximately 1 ounce of the jelly containing hexylresorcinol (Caprokol) in a dilution of 1:1,000 was inserted into the rectum at bedtime by means of a metal pile pipe screwed on the head of a collapsible tube containing the material. It was hoped that the use of the jelly in this manner might kill worms coming in contact with it in the rectum, thus preventing the migration of gravid females, and that it might kill ova as well as worms. The jelly was used every night or every other night for varying periods of time, as indicated in the table. Six of the eight patients were positive on post-treatment

swab examinations. Of the 2 negative cases, 1 was doubtfully negative since only 3 post-treatment swabs were furnished. Other patients, not recorded in table 5, were also treated with the jelly. Owing to the fact that migration of gravid female pinworms occurred in these cases, other treatment was substituted. The results are not recorded in the table since the cases were not carried to completion.

Two patients treated with hexylresorcinol jelly were kept under close observation by one or more of us for varying periods of time. In both cases, following the insertion of the jelly into the rectum, gravid female pinworms migrated, sometimes within one-half hour after treatment. Embryonated ova from these worms developed normally when incubated in a moist chamber. From the results recorded in table 5, and from our personal observations on two of the cases, it would seem that hexylresorcinol jelly is not dependably effective for the destruction of gravid females in the rectum; neither will it always prevent the migration of gravid females nor render nonviable the ova deposited by migrating females.

While our tests indicate that hexylresorcinol enemas are of value in the treatment of cases of oxyuriasis when given in repeated treatments over a sufficient period of time, this method of therapy has two disadvantages. The drug is expensive and, in order to be effective in most cases, it must be given over a considerable period of time, this second objection being applicable also to any sort of treatment by enemata alone. Both of these features are particularly disadvantageous in the case of large family groups, since the cost of the treatment would be prohibitive for those in the lower economic brackets, and since few parents have the persistence to carry out repeated enema administrations over a period of 3 or more weeks either on themselves or on a large number of children.

THE USE OF ANAL OINTMENTS

The use of anal ointments is recommended frequently in the medical literature as an adjunct to oxyuriasis treatment for the ostensible purpose of inhibiting migration of gravid female worms or of killing ova expelled by migrating worms. Studies indicate that very few of the many ointments recommended in the literature actually have any lethal effect on the ova, even in laboratory tests in which the ova are covered by the ointment. Furthermore, when applied to the anal region, the ointments tested have been of no value in restricting the migration of the gravid females or in killing the ova deposited by them. Some of these ointments appear to be of value in helping to allay the pruritis caused by the migration of the female worms and their movements on the skin, but are of little or no value from the standpoint of controlling the pinworm infection.

TREATMENT WITH NONMEDICATED ENEMAS

The use of nonmedicated enemas has a certain advantage in that the treatment is without cost, provided the necessary apparatus for administering the enemas is at hand. Such enemas are useful in treating pinworm infections in infants and young children too small to take oral therapy satisfactorily. Cram and Nolan (*9*) reported on the incidence of pinworms in pupils in a private nursery school and described measures employed for the control of such infections under the difficult conditions for control existing in an institution of this kind. The major therapeutic measure employed in the case of these children consisted in the frequent use of nonmedicated enemas supplemented by other therapy in a few persistent infections. The marked reduction in the number of pinworm positives in the institution over the period studied gave evidence concerning the usefulness of such enemas. The protocols of these cases are not available since we were unable to secure detailed information concerning the number of enemas given or the frequency of the treatments in the different individuals. However, evidence obtained from other cases substantiates these observations.

In most cases, the minimum routine necessary to bring about cure consists in the administration of an enema every other night at bedtime over a period of at least 3 to 4 weeks. Many cases require more prolonged treatment. The efficacy of any enema treatment is perhaps correlated with the personal habits of the individual and the degree of exposure encountered in the household; some individuals possess habits which are conducive to maintaining a heavy pinworm infection by repeated reinfection through the intake of large numbers of pinworm ova. Cases of this sort are difficult to deal with by means of enemas, and some of them require prolonged enema treatment before a satisfactory result can be obtained. One of the limiting factors in the administration of enemas over relatively long periods of time is the interference with normal evacuations. Consequently, such therapy may be of definite disadvantage in those persons with a tendency to constipation.

SUMMARY AND CONCLUSIONS

In experiments reported in this paper, diagnostic examinations were made on all members of each family represented and all members infected with pinworms were treated at the same time in an effort to eliminate simultaneously all sources of pinworm infection within the household. Diagnosis was made and the efficacy of the treatments was checked by use of the NIH cellophane swab. Effort was made to obtain 7 consecutive daily post-treatment swabs on each patient, evidence indicating that the use of 7 swabs will detect nearly all cases of pinworm infection. However, some patients failed to furnish the necessary number of swabs.

Twenty patients were treated with santonin in a single dose daily over a period of 10 days. Nine of these cases were positive and 11 were negative on post-treatment swab examinations. However, 5 of the patients furnished only 5 post-treatment swabs each, and 2 only 3 swabs each. If due allowance is made for the insufficient number of swabs, the efficacy of the treatment was probably at the rate of less than 50 percent.

Eighteen of 27 cases treated with a varying number of enemas consisting of hexylresorcinol in a dilution of 1:2,000 in water were negative on post-treatment swab examinations. Some of the positive patients received an inadequate number of enemas. Results show that such enemas are of considerable value in the treatment of pinworm infections. Ten enemas spaced over a period of 3 weeks constitute the minimum number necessary usually to eradicate pinworm infections; some cases require more prolonged treatment.

Hexylresorcinol administered in the form of Caprokol pills in a single dose orally failed to eradicate pinworm infections in the 4 cases treated in this manner.

One of three patients treated with hexylresorcinol orally and by enema was negative on post-treatment swab examinations. While relatively few patients were included in our series, the oral administration of hexylresorcinol in the form of Caprokol pills apparently does not constitute an effective treatment for oxyuriasis, even when supplemented by an enema and repeated weekly for a period of 3 weeks.

Eight pinworm patients were treated by the use of 1 ounce of 1:1,000 hexylresorcinol (Caprokol) jelly inserted into the rectum at bedtime over varying periods of time. This treatment was found ineffective in controlling pinworm infections.

Some of the anal ointments recommended in the medical literature appear to be of value in helping to allay the pruritis occasioned by the migration of gravid female pinworms but anal ointments in general are of little or no aid in the control of pinworm infections.

Nonmedicated enemas, including soapsuds and saline enemas, are sometimes of advantage in treating pinworm infections in infants and young children. Satisfactory results are usually not obtained unless enemas are repeated every other night for at least 3 to 4 weeks. Many cases require more prolonged treatment.

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THE SIGNIFICANCE OF THE EXCRETION OF LEAD IN THE URINE[1]

By Lawrence T. Fairhall, *Principal Industrial Toxicologist*, and R. R. Sayers, *Senior Surgeon, United States Public Health Service*

The excretion of lead which has entered the body either by the inhalation of gaseous or of solid compounds (dust), or by the ingestion of various lead-containing substances, occurs chiefly through either the gastrointestinal tract or the kidneys. Such other avenues of excretion as saliva, perspiration, milk, or nasal or lachrymal secretions are apparently of negligible importance.

Since lead was first found to occur in the excretions in lead poisoning by Devergie (*1*), attention has been increasingly directed towards the amount of excreted lead as an index of lead poisoning. Following Devergie's investigation a great deal of literature has accumulated dealing with the fecal and urinary excretion of lead.

Abdominal colic has been one of the important early symptoms of lead poisoning, and it was natural that the earlier investigators of lead poisoning turned their attention to the gastrointestinal tract in an effort to ascertain the cause of the colic. The irregular contraction of the intestine noted by Oliver (*2*) led him to ascribe the colic to interference with the rhythmic contractility of the smooth muscle owing to the local action of lead. Mann (*3*) found that most of the lead ingested orally by man was excreted in the feces, and more recent work (*4*) has shown that, in one case where lead arsenate was used, this excretion may reach as high as 97.5 percent of the total amount ingested. Lead has long been known to have a cumulative action, and amounts ingested or inhaled, which would be insignificant in themselves, may eventually cause lead poisoning. The threshold quantity necessary to bring about poisoning is thought to vary somewhat with individuals, and according to age and sex. When lead is

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

ingested beyond the capacity of the body to eliminate it in the excretions, the further protective mechanism of the organism as a whole is that of storage. The lead is immobilized to an extent by storage in the bone tissue (*5*). It is incorrect, however, to consider that all the lead which enters the gastrointestinal tract or the respiratory tract is stored. While the extent to which storage occurs in man at different levels of lead intake is still unknown, minute quantities of lead are apparently efficiently removed from the body by the excretory processes (*6*).

Because of the occurrence of relatively large amounts of lead in the feces of lead-exposed individuals, fecal lead for a time assumed some importance as an aid in diagnosis.

The significance to be attached to fecal lead is still, however, somewhat in doubt. How much of it represents lead that has simply passed through the gastrointestinal tract completely unabsorbed is not known. Mann (*7*), in his study of the excretion of lead in individuals ingesting lead acetate administered therapeutically, found that soluble lead salts were converted into an insoluble form and eliminated in the feces. Numerous investigators have found lead in the bile in acute and chronic poisoning and the assumption has been made that lead passing through the gastrointestinal tract is absorbed, removed from the circulation by the liver, and re-excreted in the bile. Behrens and Baumann (*8*) found that the intravenous injection of radioactive lead in rats was quickly followed by the appearance of lead in the bile, and that the bile lead reached a maximum after 14 minutes. The form in which lead is excreted in the bile is unknown, and, indeed, the proportion of lead absorbed in the alimentary tract to the total amount of lead ingested still awaits determination.

In view of our lack of knowledge of what happens to lead in its passage through the gastrointestinal tract, the lead content of the feces is of no practical significance at the present time, beyond indicating a certain degree of lead exposure.

More weight can be attached to the urinary excretion of lead. Following the ingestion of lead, the proportion that is excreted in the urine is small compared to that excreted through the gastrointestinal tract, but much more importance can be attached to urinary lead values. Urinary lead definitely indicates absorbed lead, that is, lead that has passed into the blood stream and which has finally been removed from the blood and excreted by the kidneys. This lead has presumably entered most intimately into the structure of the body and has in turn bathed all the tissues and cells comprising the organism as a whole. Some significance can be attached, therefore, to the amount of lead excreted by the kidneys. The quantity of output can be affected by varying the physiological condition, i. e., by the production of an acidosis (*9*) or by the feeding of parathyroid extract

(*10*). On the other hand Litzner, Weyrauch, and Barth (*11*) made the interesting observation that output of lead is independent of diuresis.

However, the output of urinary lead in individuals exposed to lead in one form or another does vary somewhat and is probably affected by the physiological condition of the individual. There apparently exists some confusion of thought with regard to the significance to be attached to the presence of lead in the urine. Since the presence of lead in any quantity in the urine has been used as a diagnostic aid in lead poisoning some have concluded that the presence of lead is evidence *per se* of lead poisoning. Other investigators have stated that there is a "normal" figure above which the amount of lead may have clinical significance and below which it is of no consequence. The concept of "normal lead" is not new, for Devergie, in 1836, objected to the term as conveying the idea of an indispensable, or physiologically essential, substance; and shortly afterward Orfila, Devergie, Flandin, and Danger made it the subject of active investigation.

While no one questions the fact that traces of lead may occur in the urine, the actual amounts are generally low, below those found in groups of individuals who are definitely exposed to lead. The question then is not so much the amount, but rather the significance of urinary lead output taken in relation to other clinical findings.

In brief, the excretion of a tenth or even of several tenths of a milligram of lead in the urine per day does not necessarily indicate that the individual has lead poisoning, any more than the absence or presence of only a few micrograms of urinary lead per day in a case of lead poisoning (which not infrequently occurs) is an indication that the individual does not have lead poisoning.

In other words the presence of urinary lead merely indicates that the individual has been exposed to lead in some form and that absorption of lead has occurred. It is necessary, therefore, to consider the excretion of lead and particularly that of urinary lead only in connection with other diagnostic findings in relation to lead poisoning. It should be emphasized that the presence of lead in the urine indicates lead absorption only, and in the absence of other signs and symptoms is of itself insufficient diagnostic evidence of lead poisoning.

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SIPHONAPTERA: NOTES ON SYNONYMY OF NORTH AMERICAN SPECIES OF THE GENUS *HOPLOPSYLLUS* BAKER[1]

By Glen M. Kohls, *Assistant Entomologist, United States Public Health Service*

Several species of the flea genus *Hoplopsyllus* infest wild hares and rabbits in North America. The following have been described: *H. glacialis glacialis* (Tasch.) 1880, *H. glacialis lynx* (Baker) 1904, *H. affinis* (Baker) 1904, *H. foxi* Ewing 1924, *H. powersi* Fox 1926, and *H. minutus* Fox 1926. Incident to a study of these fleas it has been apparent that the validity of some of the species is questionable, and available materials and data appear to warrant the following notes.

H. glacialis glacialis and *H. glacialis lynx* are morphologically very similar. On the basis of the few specimens of the former available for examination (received from Dr. Karl Jordan) the only difference between the two appears to be in size, *glacialis lynx* being notably smaller. However, on the grounds of host relationships and geographical distribution, it is probably desirable for the present, at least, to retain the subspecific distinction. *H. glacialis glacialis* is regarded as being restricted to the arctic hares (*Lepus arcticus* subspp.) and their predators, while *H. glacialis lynx* is restricted to the varying hares (*Lepus americanus* subspp.) and their predators, principally *Lynx* spp.

H. affinis is unquestionably distinct and valid. Remaining to be considered are *H. foxi*, *powersi*, and *minutus*, all described from California, the brush rabbit, *Sylvilagus bachmani*, being the type host.

As to *H. foxi* and *H. powersi* there is at hand a male flea forwarded by Mr. Benjamin J. Collins, formerly of the Division of Zoology of the National Institute of Health, with the statement that it appeared to have been of the same lot as the type specimen of *foxi*, a male, with which it agreed, and like the type it bore the determination of "*H. affinis*" in the handwriting of Dr. Fox. Also, host, locality, and date of collection are the same as for the type. The writer has not seen the types of *powersi*, but has examined a series of determined speci-

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

mens which Mr. Collins compared with the types. When compared with the *foxi* specimen, this material shows some variation in the number of spines in the thoracic ctenidium and in the relative length of the spined and bristled processes of the male clasper, but these differences are not sufficient to permit its separation from *foxi*. Since *H. foxi* has priority, *powersi* becomes a synonym. Ewing (1924) pointed out distinguishing characteristics of *foxi* and *affinis*. *Foxi* is most closely related to *glacialis lynx*.

Only the female of *H. minutus* is known, and its description is inadequate. The spermatheca, as figured by Fox, is indistinguishable from that of *foxi*. The type specimen, the only one known, is in the United States National Museum. Collins, in correspondence, stated, "With the exception of its small size and the reduction in the number of spines in the thoracic ctenidium, I was unable to find any differences." It appears certain that the description was based on a dwarfed specimen of *foxi*. *H. minutus* then becomes a synonym.

SIPHONAPTERA: A LIST OF ALASKAN FLEAS[1]

By WILLIAM L. JELLISON, *Assistant Parasitologist*, and GLEN M. KOHLS, *Assistant Entomologist, United States Public Health Service*

Few records of fleas in Alaska have appeared in the literature. Prior to 1938 only four species were known. In that year Medical Entomologist C. B. Philip (*1*), of the Rocky Mountain Laboratory, reported 12 species collected during the summer of 1937, 10 of which had not been previously reported. The accompanying list, which includes hitherto unreported collections and more detailed data on the specimens collected by Dr. Philip, comprises, we believe, a complete list of the Alaskan records up to the present time. Determinations were made by the authors unless otherwise stated.

The geographical proximity of northwestern North America of the Nearctic region to northeastern Asia of the Palearctic region, as well as the recognized close relationship of their respective vertebrate fauna, suggests the possibility of a similar relationship of their parasitic fauna. Such a relationship of the flea fauna was definitely shown by Wagner (*2*) incident to a study of fleas of western Canada, and further evidence is afforded by the accompanying Alaskan records. Although only about one-third of the North American genera of Siphonaptera are common to the Old World (*3*), yet 9 of the 11 genera reported for Alaska are also Palearctic. Five of the species listed, *Ceratophyllus garei*, *C. vagabunda*, *Mioctenopsylla arctica*, *Malaraeus penicilliger*, and *Hoplopsyllus glacialis*, are also Asiatic species, although

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

the Nearctic representatives of the last two have been assigned to distinct subspecies. Typical *H. glacialis*, which infests the arctic hare, *Lepus arcticus*, has not been reported for Alaska but is known to be circumpolar in distribution and probably does occur on the two Alaskan subspecies of arctic hare.

Nearctic distribution of the known Alaskan genera and species is also of interest. *Mioctenopsylla* so far appears limited to the arctic or subarctic region. The other 10 genera extend southward into the United States, 7 occurring in both eastern and western States, while 3, namely, *Arctopsylla*, *Thrassis*, and *Malaraeus*, have been found only in the West. Four of the species, namely, *H. glacialis lynx*, of the varying hare, *Orchopeas caedens durus* and *Monopsyllus vison*, of the red squirrel, and *Oropsylla arctomys*, of the marmot, extend into both eastern and western States and are probably continuous in their distribution across northern North America, coincidental with the occurrence of their hosts.

SPECIES LIST

1. *Arctopsylla ursi* (Rothschild) 1902.
   Black bear, *Ursus americanus*, Funny River, Anchorage, September 3, 1935.
   23 ♂♂, 33 ♀♀. Collected by Jack O'Connor.
2. *Ceratophyllus garei* Rothschild 1902.
   Ptarmigan, *Lagopus leucurus*, Mills Creek, June 28, 1937.
   3 ♂♂, 6 ♀♀ from nest.
3. *Ceratophyllus niger* Fox 1908.
   Herring gull, *Larus argentatus*, Skilak Lake, June 25, 1937.
   54 ♂♂, 87 ♀♀. Collected and reared from 3 nests.
   Double-crested cormorant, *Phalacrocorax auritus*, Skilak Lake, June 25, 1937.
   21 ♂♂, 16 ♀♀. Collected and reared from 3 nests.
4. *Ceratophyllus vagabunda* (Boheman) 1865.
   Golden eagle, *Aquila chrysaetos*, Bear Creek, Rapids, July 15, 1937.
   1 ♂, 2 ♀♀. From fledglings and nest. Determined by Dr. Karl Jordan.
5. *Hoplopsyllus glacialis lynx* (Baker) 1904.
   Varying hare, *Lepus americanus*, Circle, July 7, 1937 (3 hosts).
   3 ♂♂, 5 ♀♀.
   Rapids, July 19, 1937 (2 hosts).
   1 ♂, 1 ♀.
   Gulkana, July 21, 1937 (2 hosts).
   1 ♂, 8 ♀♀.
   Chitina, July 23, 1937 (10 hosts).
   13 ♂♂, 24 ♀♀.
   Killey River, Kenai Peninsula, September 26, 1938. 3 ♂♂, 3 ♀♀. Collected by Jack Warwick.
   Lynx sp. Dahl River, Yukon, Alaska, December 25, 1935. 9 ♂♂, 20 ♀♀.
6. *Leptopsylla* sp. (probably *hamifer* (Rothschild) 1906).
   Field vole, *Microtus* sp., Valdez Creek, September 23, 1937.
   1 ♀.
   Varying hare, *Lepus americanus*, Fairbanks, September 11, 1937.
   1 ♀ (accidental host).

7. *Malaraeus penicilliger dissimilis* Jordan 1938.
   Field vole, *Microtus* sp., Flat, March 1925. Recorded by Jordan (1929).
   Red-backed mouse, *Evotomys dawsoni*, Rapids, July 1937.
   3 ♂♂, 3 ♀♀. Determined by Dr. Karl Jordan.
   Field vole, *Microtus* sp., Fairbanks, July 1937.
   2 ♂♂.
   Cantwell, 1937.
   1 ♂. Collected by D. G. Nichols.
   Varying hare, *Lepus americanus*, Rapids, July 19, 1937.
   1 ♂ (accidental host).
8. *Megabothris quirini* (Rothschild) 1905.
   Red-backed mouse, *Evotomys dawsoni*, Rapids, July 13, 1937.
   1 ♂, 1 ♀.
   Field vole, *Microtus* sp., Fairbanks, July 13, 1937.
   3 ♂♂, 1 ♀. Determined by Dr. Karl Jordan.
9. *Monopsyllus ciliatus protinus* (Jordan) 1929.
   Pine squirrel, *Sciurus hudsonicus*, Seward, June 18–20, 1937.
   3 ♂♂, 4 ♀♀.
10. *Monopsyllus vison* (Baker) 1904.
   Pine squirrel, *Sciurus hudsonicus*, Lake Bennet, Yukon Territory, Alaska, June 19, 1937.
   4 ♂♂, 7 ♀♀. (This series shows much variation in shape of sternite VII.)
   Seward, June 18–20, 1937.
   9 ♂♂, 3 ♀♀.
   Skilak Lake, June 25, 1937.
   7 ♂♂, 9 ♀♀.
   Marmot, *Marmota monax*, Fairbanks, July 17, 1937.
   1 ♂ (accidental host).
11. *Orchopeas caedens caedens* (Jordan) 1925.
   Pine squirrel, *Sciurus hudsonicus*, Lake Bennet, July 19, 1937.
   3 ♂♂, 3 ♀♀.
12. *Orchopeas caedens durus* (Jordan) 1929.
   Pine squirrel, *Sciurus hudsonicus*, Seward, June 18–20, 1937.
   5 ♂♂, 15 ♀♀.
   Skilak Lake, June 25, 1937.
   2 ♂♂, 1 ♀.
   Ground squirrel, *Citellus* sp., Cantwell, July 10, 1937.
   2 ♀♀ (accidental host).
13. *Oropsylla arctomys* (Baker) 1904.
   Marmot, *Marmota monax*, Fairbanks, July 17, 1937.
   4 ♂♂, 6 ♀♀.
14. *Mioctenopsylla arctica* Rothschild 1922 (=*Boreopsyllus hadweni* (Ewing) 1927, fide Jordan, 1932).
   Sabins gull, *Xema sabini*, Puffin Island, Alaska (recorded by Ewing, 1927).
15. *Oropsylla alaskensis* (Baker) 1904.
   Ground squirrel, *Citellus barrowensis*, Point Barrow (recorded by Baker 1904.)
16. *Oropsylla idahoensis* (Baker) 1904 (=*O. bertholfi* (Fox) 1927 fide Jordan, 1933).
   Ground squirrel, *Citellus nebulicola*, Nagai Island, Alaska, 1909 (recorded by Fox, 1927).
   Ground squirrel, *Citellus plesius*, Rapids, July 16, 1937.
   26 ♂♂, 41 ♀♀. (These specimens were reported as *Oropsylla* n. sp. by Phillip (1938). They differ slightly from topotypes of *O. idahoensis*, but these differences are not considered sufficient to establish a new species.)

Ground squirrel, *Citellus* sp., Cantwell, July 1937.
9♂♂, 17♀♀.
Wolverine, *Gulo luscus*, Bear Creek, Rapids, July 18, 1937.
1♂ (accidental host).

17. *Thrassis acamantis* (Rothschild) 1905.
Marmot, *Marmota caligata*, Seward, June 15, 1937.
10♂♂, 11♀♀.

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DEATHS DURING WEEK ENDED OCTOBER 21, 1939

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

	Week ended Oct. 21, 1939	Corresponding week, 1938
Data from 88 large cities of the United States:		
Total deaths	7,851	7,973
Average for 3 prior years	[1] 8,068	
Total deaths, first 42 weeks of year	346,902	340,704
Deaths under 1 year of age	447	478
Average for 3 prior years	[1] 513	
Deaths under 1 year of age, first 42 weeks of year	21,000	22,109
Data from industrial insurance companies:		
Policies in force	66,567,106	68,263,546
Number of death claims	11,720	13,245
Death claims per 1,000 policies in force, annual rate	9.2	10.1
Death claims per 1,000 policies, first 42 weeks of year, annual rate	10.0	9.3

[1] Data for 86 cities.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

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

Cases of certain diseases reported by telegraph by State health officers for the week ended October 28, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median

Division and State	Diphtheria				Influenza				Measles			
	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median
NEW ENG.												
Maine	12	2	3	2	------	------	2	------	12	2	5	14
New Hampshire	0	0	0	0	------	------	1	------	41	4	1	1
Vermont	0	0	0	0	------	------	------	------	268	20	4	4
Massachusetts	8	7	7	7	------	------	------	------	86	73	78	47
Rhode Island	8	1	1	0	------	------	------	------	153	20	0	3
Connecticut	0	0	0	2	3	1	5	1	24	8	29	29
MID. ATL.												
New York	7	18	29	30	[1]6	[1]18	[1]17	[1]7	36	89	135	122
New Jersey [2]	11	9	7	10	4	3	5	7	8	7	16	23
Pennsylvania	17	34	22	25	------	------	------	------	19	38	46	53
E. NO. CEN.												
Ohio	26	34	70	70	14	18	------	9	13	17	24	58
Indiana [2]	46	31	28	35	4	3	10	27	21	14	5	6
Illinois	21	32	35	42	7	11	8	8	9	13	15	20
Michigan [2]	3	3	20	20	5	5	------	2	71	67	44	24
Wisconsin	0	0	3	5	26	15	37	26	25	14	67	55
W. NO. CEN.												
Minnesota	6	3	2	6	6	3	2	1	23	12	82	14
Iowa	22	11	25	18	2	1	2	------	10	5	9	5
Missouri	18	14	21	62	------	------	15	35	5	4	9	26
North Dakota	0	0	14	4	29	4	6	2	51	7	107	3
South Dakota	38	5	2	2	------	------	5	------	210	28	26	3
Nebraska	4	1	2	2	------	------	------	------	8	2	1	1
Kansas	8	3	4	12	20	7	1	2	120	43	2	3

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended October 28, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Diphtheria				Influenza				Measles			
	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median
SO. ATL.												
Delaware	0	0	1	1	----	----	----	----	20	1	1	1
Maryland [3]	34	11	1	10	28	9	6	6	15	5	37	7
Dist. of Col.	8	1	6	8	----	----	1	1	16	2	1	1
Virginia	172	92	77	77	88	47	60	----	11	6	9	15
West Virginia	75	28	28	42	----	----	10	16	5	2	7	7
North Carolina [4]	267	183	142	138	7	5	----	8	99	68	51	30
South Carolina [4]	85	31	41	14	604	221	358	185	3	1	2	6
Georgia [4]	101	61	61	57	53	32	36	----	3	2	2	0
Florida [4]	24	8	11	18	6	2	1	1	3	1	23	2
E. SO. CEN.												
Kentucky	38	22	50	50	2	1	34	11	5	3	17	35
Tennessee [4]	51	29	58	68	9	5	25	22	4	2	1	2
Alabama [4]	77	44	53	45	93	53	33	33	4	2	6	6
Mississippi [3]	43	17	18	18	----	----	----	----	----	----	----	0
W. SO. CEN.												
Arkansas	60	24	34	23	60	24	41	12	10	4	8	2
Louisiana [4]	51	21	25	28	60	25	1	10	2	1	1	2
Oklahoma	24	12	26	25	141	70	33	32	4	2	13	1
Texas [4]	15	18	77	75	161	194	189	134	6	7	19	8
MOUNTAIN												
Montana	9	1	1	1	37	4	10	10	477	51	91	34
Idaho	0	0	0	0	----	----	----	3	92	9	18	4
Wyoming	65	3	1	1	44	2	----	----	764	35	2	2
Colorado	43	9	11	11	29	6	14	----	87	18	0	6
New Mexico	12	1	3	3	12	1	13	2	12	1	19	19
Arizona	61	5	3	8	712	58	66	22	25	2	2	3
Utah [3]	0	0	1	1	20	2	17	----	70	7	29	8
PACIFIC												
Washington	6	2	1	2	----	----	----	----	706	229	11	11
Oregon	5	1	4	3	40	8	21	21	85	17	5	7
California [4]	7	8	24	42	11	13	8	19	45	55	279	137
Total	33	840	1,053	1,053	41	861	1,093	698	41	1,020	1,359	1,359
43 weeks	17	17,893	22,487	22,487	172	156,891	52,719	108,928	333	354,791	769,163	678,037

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median
NEW ENG.												
Maine	0	0	0	0	0	0	0	2	54	9	7	10
New Hampshire	0	0	0	0	0	0	0	0	30	3	3	3
Vermont	0	0	0	0	40	3	0	0	147	11	0	5
Massachusetts	1.2	1	1	2	6	5	2	2	38	32	73	109
Rhode Island	0	0	0	0	0	0	0	0	23	3	2	10
Connecticut	0	0	0	0	0	0	0	2	89	30	23	34
MID. ATL.												
New York	0.4	1	3	6	17	42	1	10	52	130	176	237
New Jersey [3]	1.2	1	0	0	6	5	0	1	70	59	42	62
Pennsylvania	2	4	3	3	8	16	2	4	95	187	192	233

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended October 28, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median
E. NO. CEN.												
Ohio	0.8	1	3	3	6	8	2	6	130	169	287	287
Indiana [2]	0	0	3	3	10	7	0	3	150	101	110	121
Illinois	2	3	2	3	5	8	1	15	137	209	213	273
Michigan [3]	2.1	2	2	2	26	25	1	9	188	178	305	196
Wisconsin	1.8	1	0	1	5	3	0	1	172	98	137	150
W. NO. CEN.												
Minnesota	1.9	1	0	1	25	13	0	1	149	77	56	78
Iowa	2	1	0	1	34	17	2	2	138	68	62	62
Missouri	0	0	0	0	1.3	1	0	1	82	64	66	70
North Dakota	7	1	0	0	7	1	0	0	226	31	10	28
South Dakota	0	0	0	0	30	4	1	1	105	14	33	33
Nebraska	0	0	0	0	4	1	0	0	92	24	15	21
Kansas	0	0	1	0	2.8	1	0	3	187	67	96	88
SO. ATL.												
Delaware	0	0	0	0	0	0	0	0	138	7	5	5
Maryland [2]	0	0	3	2	6	2	2	1	108	35	8	52
Dist. of Col.	0	0	1	1	0	0	3	1	89	11	13	13
Virginia	1.9	1	2	3	4	2	4	4	126	67	49	65
West Virginia	0	0	4	2	2.7	1	0	1	231	86	90	110
North Carolina [4]	2.9	2	2	2	1.5	1	0	2	180	123	92	92
South Carolina [4]	2.7	1	1	1	2.7	1	0	0	74	27	17	14
Georgia [4]	1.7	1	0	0	3	2	0	1	63	38	25	33
Florida [4]	0	0	1	0	3	1	0	0	9	3	2	5
E. SO. CEN.												
Kentucky	3	2	2	2	9	5	1	3	127	73	94	77
Tennessee [4]	1.8	1	3	3	0	0	1	1	125	71	66	66
Alabama [4]	1.8	1	6	2	1.8	1	3	3	90	51	39	27
Mississippi [3]	2.5	1	2	0	0	0	3	2	41	16	15	17
W. SO. CEN.												
Arkansas	2.5	1	0	0	5	2	0	0	40	16	10	10
Louisiana [4]	2.4	1	0	1	2.4	1	0	1	29	12	13	15
Oklahoma	0	0	0	2	0	0	0	0	40	20	30	21
Texas [4]	0.8	1	1	1	2.5	3	1	4	40	48	84	56
MOUNTAIN												
Montana	0	0	0	0	0	0	0	0	290	31	23	38
Idaho	0	0	0	1	31	3	1	0	31	3	12	18
Wyoming	0	0	0	0	0	0	0	0	109	5	7	9
Colorado	0	0	0	2	43	9	1	0	111	23	26	27
New Mexico	0	0	1	0	86	7	0	0	86	7	14	15
Arizona	12	1	0	0	12	1	1	0	0	0	3	11
Utah [3]	0	0	0	0	70	7	0	0	99	10	11	17
PACIFIC												
Washington	0	0	1	1	3	1	0	4	126	41	21	34
Oregon	5	1	0	1	10	2	1	2	85	17	37	30
California [4]	2.5	3	1	2	29	35	0	14	87	106	168	168
Total	1.4	35	49	60	10	247	34	178	100	2,511	2,882	3,153
43 weeks	1.5	1,661	2,499	4,732	6	6,255	1,514	6,650	121	131,066	154,452	183,639

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended October, 28, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases	1934–38, median	Oct. 28, 1939, rate	Oct. 28, 1939, cases	Oct. 29, 1938, cases
NEW ENG.											
Maine	0	0	0	0	6	1	4	4	115	19	71
New Hampshire	0	0	0	0	0	0	1	0	0	0	4
Vermont	0	0	0	0	0	0	1	1	322	24	66
Massachusetts	0	0	0	0	1	1	1	2	113	96	81
Rhode Island	0	0	0	0	0	0	1	1	229	30	41
Connecticut	0	0	0	0	9	3	1	2	160	54	69
MID. ATL.											
New York	0	0	0	0	7	18	14	14	109	272	461
New Jersey [2]	0	0	0	0	6	5	2	4	136	114	145
Pennsylvania	0	0	0	0	8	15	36	20	124	245	209
E. NO. CEN.											
Ohio	0	0	0	0	5	6	13	18	130	169	153
Indiana [3]	1	1	4	3	4	3	3	7	46	31	10
Illinois	1	1	2	3	10	15	17	20	112	171	490
Michigan [3]	0	0	14	0	20	19	5	9	117	111	228
Wisconsin	0	0	0	0	2	1	0	4	278	158	336
W. NO. CEN.											
Minnesota	2	1	7	3	2	1	1	1	124	64	18
Iowa	12	6	1	3	4	2	2	6	36	18	9
Missouri	0	0	1	0	15	12	5	17	31	24	21
North Dakota	0	0	0	0	7	1	6	4	29	4	18
South Dakota	0	0	0	0	8	1	0	0	0	0	0
Nebraska	0	0	1	2	0	0	0	0	4	1	3
Kansas	0	0	0	1	8	3	0	4	6	2	21
SO. ATL.											
Delaware	0	0	0	0	59	3	0	4	79	4	4
Maryland [3]	0	0	0	0	31	10	9	9	173	56	21
District of Columbia	0	0	0	0	8	1	3	3	97	12	3
Virginia	0	0	0	0	11	6	14	22	45	24	49
West Virginia	0	0	0	0	8	3	8	11	22	8	20
North Carolina [4]	0	0	0	0	4	3	28	9	89	61	126
South Carolina [4]	0	0	0	0	36	13	8	8	19	7	35
Georgia [4]	0	0	0	0	25	15	9	9	7	4	12
Florida [4]	0	0	0	0	3	1	0	3	0	0	11
E. SO. CEN.											
Kentucky	0	0	0	0	9	5	13	13	101	58	54
Tennessee [4]	0	0	0	0	9	5	6	17	63	36	66
Alabama [4]	0	0	0	0	23	13	13	11	86	49	12
Mississippi [3]	0	0	0	0	13	5	4	6			
W. SO. CEN.											
Arkansas	0	0	0	0	32	13	6	6	12	5	33
Louisiana [4]	0	0	0	0	22	9	8	15	82	34	1
Oklahoma	6	3	2	0	10	5	8	18	0	0	12
Texas [4]	1	1	6	1	12	14	50	35	12	14	47
MOUNTAIN											
Montana	0	0	9	10	56	6	3	3	47	5	17
Idaho	10	1	2	2	10	1	4	3	20	2	1
Wyoming	0	0	1	1	0	0	0	0	175	8	6
Colorado	34	7	7	1	29	6	3	3	63	13	20
New Mexico	0	0	0	0	99	8	5	26	99	8	20
Arizona	0	0	1	0	12	1	2	2	123	10	3
Utah [3]	0	0	0	0	0	0	0	0	387	39	15
PACIFIC											
Washington	6	2	1	8	9	3	4	4	37	12	43
Oregon	5	1	7	0	15	3	0	2	134	27	4
California [4]	1	1	10	0	7	9	10	12	110	134	139
Total	1	25	76	76	11	268	331	420	90	2,237	3,228
43 weeks	8	8,910	13,136	6,425	10	11,271	12,671	13,291	141	150,098	176,266

[1] New York City only.
[2] Rocky Mountain spotted fever, week ended Oct. 28, 1939, 2 cases as follows: New Jersey, 1; Indiana, 1.
[3] Period ended earlier than Saturday.
[4] Typhus fever, week ended Oct. 28, 1939, 83 cases as follows: North Carolina, 4; South Carolina, 7; Georgia, 36; Florida, 3; Tennessee, 6; Alabama, 9; Louisiana, 4; Texas, 13; California, 1.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Diphtheria	Influenza	Malaria	Measles	Meningitis, meningococcus	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid and paratyphoid fever
August 1939										
Puerto Rico	49	19	1,241	24	2	----	1	0	0	21
September 1939										
Arizona	8	121	5	6	5	3	18	4	0	31
Florida	40	14	62	7	1	12	14	16	0	12
Georgia	175	90	445	9	0	26	6	96	0	49
Hawaii Territory	6	4	----	1	0	----	4	0	0	1
Kansas	18	5	13	47	8	----	11	160	1	14
Montana	4	30	----	52	1	----	2	40	4	8
Oregon	10	24	3	48	0	----	12	33	2	27
Washington	7	5	----	314	0	----	3	74	0	35
Wisconsin	1	----	----	109	4	----	26	----	1	11

August 1939

Puerto Rico:	Cases
Chickenpox	9
Dysentery	15
Leprosy	2
Mumps	1
Ophthalmia neonatorum	6
Puerperal septicemia	11
Tetanus	20
Tetanus, infantile	4
Whooping cough	72

September 1939

Chickenpox:	
Arizona	8
Florida	2
Georgia	13
Hawaii Territory	9
Kansas	23
Montana	59
Oregon	33
Washington	96
Wisconsin	219
Conjunctivitis, infectious:	
Georgia	11
Hawaii Territory	22
Dengue:	
Florida	1
Diarrhea, infectious:	
Kansas	1
Dysentery:	
Arizona	97
Florida (amoebic)	4
Georgia (amoebic)	11
Georgia (bacillary)	5
Georgia (unspecified)	3
Hawaii Territory (amoebic)	1
Kansas (bacillary)	2
Washington (bacillary)	1
Encephalitis, epidemic or lethargic:	
Arizona	1
Kansas	18
Montana	3
Washington	7
Wisconsin	1

September 1939—Continued

German measles:	Cases
Arizona	1
Kansas	4
Montana	1
Washington	5
Wisconsin	13
Glanders:	
Kansas	1
Hookworm disease:	
Georgia	1,375
Hawaii Territory	16
Impetigo contagiosa:	
Hawaii Territory	20
Kansas	16
Montana	1
Oregon	64
Washington	10
Leprosy:	
Hawaii Territory	2
Mumps:	
Arizona	17
Florida	5
Georgia	48
Hawaii Territory	60
Kansas	94
Montana	53
Oregon	41
Washington	41
Wisconsin	183
Ophthalmia neonatorum:	
Hawaii Territory	1
Montana	1
Wisconsin	1
Rabies in animals:	
Florida	2
Oregon	1
Washington	14
Relapsing fever:	
Arizona	1
Rocky Mountain spotted fever:	
Kansas	1
Scabies:	
Kansas	11
Oregon	33
Septic sore throat:	
Florida	5
Georgia	42

September 1939—Continued

Septic sore throat—Con.	Cases
Kansas	4
Montana	3
Oregon	4
Washington	9
Wisconsin	5
Tetanus:	
Georgia	1
Hawaii Territory	1
Kansas	2
Washington	1
Trachoma:	
Arizona	40
Georgia	2
Hawaii Territory	3
Washington	4
Tularaemia:	
Georgia	9
Kansas	2
Montana	1
Typhus fever:	
Florida	28
Georgia	137
Hawaii Territory	14
Undulant fever:	
Arizona	4
Florida	2
Georgia	6
Kansas	7
Oregon	2
Washington	2
Wisconsin	16
Vincent's infection:	
Kansas	17
Oregon	7
Washington	2
Whooping cough:	
Arizona	80
Florida	17
Georgia	89
Hawaii Territory	203
Kansas	56
Montana	29
Oregon	106
Washington	76
Wisconsin	528

WEEKLY REPORTS FROM CITIES

City reports for week ended October 21, 1939

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

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	208	89	26	270	442	798	5	339	53	896	----
Current week [1]	103	88	15	281	279	502	1	291	32	710	----
Maine:											
Portland	0	1	1	0	2	2	0	0	0	4	18
New Hampshire:											
Concord	0	----	0	4	0	0	0	0	0	0	11
Manchester	0	----	0	0	1	3	0	0	0	0	13
Nashua	0	----	0	0	0	0	0	0	0	0	9
Vermont:											
Barre	----	----	----	----	----	----	----	----	----	----	----
Burlington	0	----	0	0	0	0	0	0	0	4	10
Rutland	0	----	0	0	0	0	0	0	0	0	4
Massachusetts:											
Boston	1	----	0	10	11	20	0	6	1	16	196
Fall River	0	----	0	0	1	0	0	2	0	0	22
Springfield	0	----	0	0	0	2	0	1	0	7	30
Worcester	0	----	0	0	1	2	0	3	0	8	41
Rhode Island:											
Pawtucket	0	----	0	0	0	0	0	0	0	0	15
Providence	0	----	0	29	0	1	0	0	4	18	46
Connecticut:											
Bridgeport	0	----	0	0	0	1	0	2	0	0	29
Hartford	0	----	0	0	2	2	0	1	1	36	40
New Haven	0	----	0	4	2	1	0	2	0	3	49
New York:											
Buffalo	0	----	0	0	5	5	0	3	0	1	107
New York	14	11	1	16	42	31	0	61	6	89	1,351
Rochester	0	----	0	0	0	1	0	3	0	10	56
Syracuse	0	----	0	0	2	5	0	2	0	12	56
New Jersey:											
Camden	0	----	0	0	0	1	0	0	0	1	28
Newark	0	----	0	2	2	5	0	3	0	11	61
Trenton	0	----	0	0	0	2	0	1	0	2	35
Pennsylvania:											
Philadelphia	1	2	1	1	8	13	0	19	0	69	479
Pittsburgh	3	1	3	2	13	14	0	9	0	10	161
Reading	1	----	0	3	1	0	0	1	0	1	24
Scranton	0	----	----	0	----	2	0	----	0	1	----
Ohio:											
Cincinnati	7	----	1	2	6	18	0	1	0	6	123
Cleveland	1	5	0	5	9	13	0	5	1	56	183
Columbus	5	1	1	0	2	6	0	3	0	2	85
Toledo	0	----	0	2	1	9	0	2	0	5	64
Indiana:											
Anderson	0	----	0	0	0	0	0	0	0	0	9
Fort Wayne	0	----	0	0	1	6	0	0	0	0	22
Indianapolis	0	----	0	1	4	17	0	1	0	14	78
Muncie	0	----	0	0	5	2	0	1	0	0	16
South Bend	0	----	0	0	0	2	0	1	0	3	15
Terre Haute	3	----	0	1	0	2	0	1	0	0	18
Illinois:											
Alton	0	----	0	0	0	2	0	0	0	3	10
Chicago	10	5	1	5	24	67	0	34	0	66	663
Elgin	0	----	0	0	1	0	0	0	0	1	4
Moline	0	----	0	0	0	0	0	0	0	0	3
Springfield	0	----	0	1	5	1	0	1	0	2	23
Michigan:											
Detroit	1	----	0	5	5	57	0	16	2	30	247
Flint	0	----	0	2	0	3	0	1	0	2	22
Grand Rapids	0	----	0	1	0	5	0	0	1	3	43
Wisconsin:											
Kenosha	0	----	0	1	0	9	0	1	0	1	8
Madison	0	----	0	0	0	7	0	0	0	3	8
Milwaukee	2	----	0	3	3	26	0	4	0	22	90
Racine	0	----	0	0	0	0	0	0	0	2	10
Superior	0	----	0	0	0	0	0	0	0	0	8

[1] Figures for Barre, Vt., and Los Angeles, Calif., estimated, report not received.

City reports for week ended October 21, 1939—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Minnesota:											
Duluth	0	------	0	0	1	0	0	0	0	4	20
Minneapolis	0	------	0	1	6	16	0	1	0	5	103
St. Paul	0	------	0	1	2	10	0	1	0	31	56
Iowa:											
Cedar Rapids	0	------	--------	0	-------	1	0	-------	2	1	--------
Davenport	0	------	--------	0	-------	4	0	-------	0	0	--------
Des Moines	0	------	0	3	0	14	0	0	0	0	29
Sioux City	0	------	--------	0	-------	5	0	-------	0	1	--------
Waterloo	4	------	--------	2	-------	3	0	-------	0	3	--------
Missouri:											
Kansas City	1	------	0	1	5	17	0	5	2	0	78
St. Joseph	0	------	0	1	4	2	0	0	0	0	35
St. Louis	3	------	0	0	6	9	0	7	0	13	189
North Dakota:											
Fargo	0	------	0	0	0	0	0	1	0	2	8
Grand Forks	0	------	--------	0	-------	0	0	-------	0	0	--------
Minot	0	------	0	0	0	1	0	0	0	0	1
South Dakota:											
Aberdeen	0	------	--------	0	-------	1	0	-------	0	0	--------
Sioux Falls	0	------	0	0	0	10	0	0	0	0	9
Nebraska:											
Lincoln	0	------	--------	0	-------	0	0	-------	0	4	--------
Omaha	1	------	0	1	1	1	0	1	0	2	62
Kansas:											
Lawrence	1	3	0	0	1	0	0	0	0	0	7
Topeka	2	2	2	1	3	5	0	2	0	0	28
Wichita	1	1	0	9	1	3	0	0	0	0	25
Delaware:											
Wilmington	0	------	0	0	1	0	0	0	0	0	30
Maryland:											
Baltimore	1	4	1	0	11	6	0	11	0	34	205
Cumberland	0	------	0	0	0	1	0	1	0	0	18
Frederick	0	------	0	0	0	0	0	0	0	0	4
Dist. of Col.:											
Washington	4	------	0	1	11	12	0	3	1	7	142
Virginia:											
Lynchburg	6	------	0	0	0	2	0	0	0	15	11
Norfolk	3	8	0	0	2	2	0	0	0	0	21
Richmond	1	------	1	0	2	2	0	2	0	4	60
Roanoke	1	------	0	0	0	0	0	0	1	0	13
West Virginia:											
Charleston	0	------	0	0	0	0	0	0	1	0	3
Huntington	2	------	--------	0	-------	0	0	-------	1	0	--------
Wheeling	0	------	0	0	1	2	0	0	0	2	16
North Carolina:											
Gastonia	2	------	--------	0	-------	0	0	-------	0	0	--------
Raleigh	1	------	0	0	1	0	0	1	0	0	21
Wilmington	1	------	0	0	0	0	0	0	0	0	15
Winston-Salem	1	------	0	1	1	3	0	0	0	0	16
South Carolina:											
Charleston	3	5	0	0	1	0	0	2	1	0	13
Florence	2	29	0	0	1	2	0	0	0	2	11
Greenville	0	------	0	0	0	0	0	0	0	0	8
Georgia:											
Atlanta	4	16	0	0	1	3	0	5	0	0	78
Brunswick	0	1	1	0	0	0	0	0	0	0	3
Savannah	0	7	1	1	4	2	0	0	0	1	27
Florida:											
Miami	0	------	0	0	0	3	0	2	1	0	33
Tampa	2	1	1	0	1	0	0	0	1	0	33
Kentucky:											
Ashland	0	1	0	0	0	0	0	0	0	0	4
Covington	0	------	1	0	2	3	0	0	0	0	15
Lexington	0	------	0	0	0	0	0	1	1	0	17
Louisville	0	------	0	0	4	10	0	3	0	13	74
Tennessee:											
Knoxville	0	------	0	0	0	3	0	0	0	0	31
Memphis	0	------	0	0	0	4	0	5	0	15	63
Nashville	1	------	0	1	3	3	0	4	0	0	49
Alabama:											
Birmingham	2	------	0	0	2	2	0	2	0	0	55
Mobile	1	6	0	0	1	2	0	0	0	0	19
Montgomery	4	1	--------	0	-------	3	8	-------	0	0	--------
Arkansas:											
Fort Smith	0	------	--------	0	-------	1	0	-------		0	--------
Little Rock	0	------	0	0	0	3	0	2	0	0	--------

City reports for week ended October 21, 1939—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Louisiana:											
Lake Charles	0	------	0	0	0	0	0	0	0	0	4
New Orleans	4	1	0	1	9	5	0	7	3	2	131
Shreveport	2	------	1	0	5	0	0	0	1	0	43
Oklahoma:											
Oklahoma City	0	2	0	0	3	1	0	1	1	0	41
Tulsa	0	------	--------	0	-------	1	0	-------	0	0	--------
Texas:											
Dallas	3	------	0	0	3	1	0	3	0	0	55
Fort Worth	1	------	0	0	3	5	0	2	0	2	33
Galveston	0	------	0	0	3	1	0	0	0	0	13
Houston	0	------	0	0	1	4	0	3	0	2	68
San Antonio	1	------	0	0	2	2	0	0	5	0	57
Montana:											
Billings	0	------	0	1	1	1	0	0	0	0	6
Great Falls	1	------	0	1	0	0	0	0	0	2	10
Helena	0	------	0	0	0	1	0	0	0	0	1
Missoula	0	11	0	0	0	0	0	0	0	2	3
Idaho:											
Boise	0	------	0	0	1	0	0	0	0	0	6
Colorado:											
Colorado Springs	0	------	0	0	0	1	0	2	0	0	15
Denver	0	------	0	0	8	0	0	6	0	0	87
Pueblo	1	------	0	0	2	2	0	2	0	0	12
Utah:											
Salt Lake City	0	------	0	3	1	4	0	0	0	33	31
Washington:											
Seattle	0	------	0	13	4	2	1	4	0	2	93
Spokane	0	------	0	1	0	5	0	0	0	1	19
Tacoma	1	------	0	129	0	1	0	1	0	0	31
Oregon:											
Portland	1	------	0	0	3	10	0	2	0	0	77
Salem	0	------	--------	5	-------	0	0	-------	0	0	--------
California:											
Los Angeles	------	------	--------	------	-------	------	------	-------	------	------	--------
Sacramento	0	------	0	1	1	1	0	0	0	0	22
San Francisco	1	1	0	7	6	6	0	7	0	5	145

State and city	Meningitis meningococcus		Poliomyelitis cases
	Cases	Deaths	
Maine:			
Portland	0	0	1
Massachusetts:			
Boston	0	0	1
New York:			
Buffalo	0	0	17
New York	0	0	9
Rochester	0	0	5
Syracuse	0	0	1
New Jersey:			
Trenton	0	0	2
Pennsylvania:			
Philadelphia	0	0	11
Pittsburgh	0	0	3
Scranton	0	0	3
Ohio:			
Cleveland	0	0	3
Toledo	0	0	1
Illinois:			
Chicago	3	0	3
Michigan:			
Detroit	0	0	9
Flint	0	1	0
Grand Rapids	0	0	1
Wisconsin:			
Madison	1	0	0
Milwaukee	0	0	1
Minnesota:			
Minneapolis	0	0	7
St. Paul	0	0	3
Iowa:			
Des Moines	0	0	6
Missouri:			
St Louis	0	0	1
Kansas:			
Topeka	0	0	2
Wichita	0	0	1
Delaware:			
Wilmington	0	0	1
Maryland:			
Baltimore	0	0	2
District of Columbia:			
Washington	0	0	1
Alabama:			
Montgomery	0	0	1
Colorado:			
Colorado Springs	0	0	1
Pueblo	0	0	3
Utah:			
Salt Lake City	0	0	2
Washington:			
Seattle	0	0	1
Oregon:			
Portland	0	0	2
California:			
Sacramento	1	0	1
San Francisco	0	0	3

Encephalitis, epidemic or lethargic.—Cases: New York, 4; Wheeling, 1; Louisville, 1; Missoula, 1.
Pellagra.—Cases: Wichita, 1; Baltimore, 1; Charleston, S. C., 4; Florence, 3; Atlanta, 1; Savannah, 2; Birmingham, 1; Montgomery, 1; New Orleans, 2.
Typhus fever.—Cases: New York, 2; Charleston, S. C., 4; Savannah, 5; Tampa, 1; Dallas, 2; Houston, 2; San Antonio, 1.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Weeks ended October 7 and 14, 1939.—During the weeks ended October 7 and 14, 1939, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Week ended October 7, 1939

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1	1					2
Chickenpox			2	41	84	6	33	38	27	231
Diphtheria		2	3	39	1	3	11			59
Dysentery				3	1				5	9
Influenza		10			65	2				77
Lethargic encephalitis							1			1
Measles				39	31	3	2		9	84
Mumps				6	24	3	1	4	11	49
Pneumonia	1	4			8	1			9	23
Poliomyelitis				2	14			1		17
Scarlet fever		13	3	57	89	17	10	17	13	219
Trachoma									1	1
Tuberculosis	1	6	7	68	45	1	12			140
Typhoid and paratyphoid fever			3	19	5		2	5		34
Whooping cough		4		52	35	24	22	1	8	146

Week ended October 14, 1939

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1					2	3
Chickenpox		4	1	67	136	14	31	26	71	350
Diphtheria			2	28	1	2				33
Dysentery				12	12				6	30
Influenza		33			9				3	45
Measles		2		120	124	6		2	63	317
Mumps				16	48	1		1	11	77
Pneumonia		1			19		2		4	26
Poliomyelitis		1		3	12		2			18
Scarlet fever		7	8	65	105	24	4	30	18	261
Trachoma						5				5
Tuberculosis		3	8	94	48	39	1	2		195
Typhoid and paratyphoid fever		1	2	21	7	1	3	4	1	40
Whooping cough		22		33	41	48	83	16	22	265

NOTE.—No cases of the above diseases were reported from Prince Edward Island for the week ended October 14, 1939.

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

NOTE.—A cumulative table giving current information regarding the world prevalence of quarantinable diseases for a six-month period appeared in the PUBLIC HEALTH REPORTS of October 27, 1939, pages 1950-1963. A similar cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

Plague

Argentina—Tucuman.—During the period October 1 to 15, 1939, 1 case of plague was reported in the vicinity of Tucuman, Argentina.

Hawaii Territory—Island of Hawaii—Hamakua District—Hamakua Mill Sector.—A rat found on October 4, 1939, in Hamakua Mill Sector, Hamakua District, Island of Hawaii, T. H., has been proved positive for plague.

Smallpox

Venezuela—Tachira State—San Cristobal.—During the period September 1 to 15, 1939, 17 cases of smallpox (alastrim) were reported in San Cristobal, Tachira State, Venezuela.

Yellow Fever

Togo (French mandate)—Anecho.—On October 19, 1939, 1 case of yellow fever was reported in Anecho, Togo (French mandate).

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