Public Health Reports

Vol. 58 • **NOVEMBER 26, 1943** • *No. 48*

THE PROMIN TREATMENT OF LEPROSY. A PROGRESS REPORT

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Promin, the sodium salt of p. p. diaminodiphenylsulfone n. n. didextrose sulfonate, has been used in experimental tuberculosis in guinea pigs with remarkable success (*1*). Its clinical trial in human tuberculosis as a chemotherapeutic agent has met with at least promising results (*2*). Its experimental use in the treatment of leprosy was commenced by the writers over 2 years ago, and at present it is felt that promin is a therapeutic agent worthy of further trial in human leprosy. The writers have had no experience with the drug in murine leprosy, but in this type of the disease the reports are suggestive of slight action (*3*).

In our experience promin is the best of all the sulfonamide derivatives, including sulfanilamide, sulfathiazole, sulfapyridine, and sulfadiazine, which have been used in the treatment of leprosy at the National Leprosarium (*4*). It can be regarded as the most encouraging experimental treatment ever undertaken at the National Leprosarium. The writers are not in a position at this time to state that it possesses any specific action upon Hansen's bacillus. They consider it an advance in the right direction in the chemotherapy of leprosy and hope that further synthesis of the sulfa chemicals will produce a product which has specific properties against M. leprae and M. tuberculosis.

Our experimental study was made possible through the cooperation of Parke Davis & Co., the manufacturers of promin, which was generously supplied gratis for this experiment through Dr. E. A. Sharp, the director of the Department of Clinical Investigation of this firm.

TECHNIQUE

Promin can be given orally or intravenously. By oral administration it is more toxic, and much larger doses are tolerated by the intravenous route. In our preliminary studies promin was given by mouth to a group of 10 patients. Small doses of ½ to 1 gm. were

tolerated for such short periods that therapeutic effects seemed unlikely by this method of administration. Severe reactions, particularly hemolysis, were so easily provoked that this mode of medication was soon abandoned. Since then the intravenous injection has been favored in all cases. The great majority of patients under treatment have received from 1 to 5 gm. daily for 6 days a week, Sunday excepted. Most of the patients were given the 5-gm. dose, and the course of treatment was continuous for months with only short intervals of rest of 1 to 2 weeks three times a year. In the case reports, in calculating the average daily dose, these rest periods and Sundays are included.

Studies of the promin concentration in the blood showed a rapid decline. It was found that only traces remained 6 to 8 hours following the intravenous administration of 5 gm. of promin.

TOXIC MANIFESTATIONS

The intravenous administration of promin is not free from toxic reactions. The most important of these is a slow destruction of the erythrocytes. This effect is generally delayed for several weeks, but one must be constantly on the alert for its development. It is our practice to do complete blood counts routinely every 2 weeks on every patient on this treatment.

In the writers' experience, anemia occurs in 46 percent of cases after 6 weeks of intravenous promin therapy. The longer the continuous course of treatment, the greater the number of anemic patients. It was observed that during the complete course of treatment the erythrocytes fell to 3.5 million or less in 71 percent of cases and in 9 percent they fell below 3 million. In the great majority of these cases antianemic therapy, with or without cessations of promin, was successful in raising the red blood cells and hemoglobin to their former levels.

Satisfactory maintenance of blood levels can be attained in several ways. A fall of the red blood cells below 4 million is an indication to start the patient on inorganic iron, ferrous sulfate, or ferrous carbonate, in adequate doses. This usually restores the red blood cell count and hemoglobin level, as occurred in 66 percent of our cases. If the erythrocytes continue to decrease, an oral liver and iron preparation is substituted for the iron. This proved adequate in readjusting the erythrocytes and hemoglobin in 60 percent of cases not responding to iron alone. A certain percentage of patients do not respond to these simple measures. In such instances and whenever the red blood cells decline below 3 million, promin is discontinued temporarily and liver extract is administered parenterally in addition to iron orally. This treatment is continued until the erythrocytes

rise above 3.5 million, when it is considered safe to resume promin therapy at the rate of 2 gm. a day, provided the liver and iron are continued.

According to Higgins (*5*) promin in guinea pigs exerts a direct toxic effect on the erythrocytes, leading to their destruction and removal from the blood by the spleen. He found that promin did not permanently damage the bone marrow and regeneration of erythrocytes proceeded during continuous administration of the drug.

The writers have observed that in some cases the institution of promin therapy actually resulted in an increase in the red blood cell count and the hemoglobin percentage. It is believed that in such cases the healing of secondary infections results in a general improvement in the patient's health, one of the manifestations of which is the lessening of secondary anemia.

Besides a decrease in the red blood cells, leucopenia has been encountered. It occurred in 3 percent of the cases under treatment. Severe agranulocytosis did not develop, but it was thought best to discontinue promin promptly whenever the white blood cells fell below 3,000. In one case promin treatment was abandoned because the response to injections of pentnucleotide and liver extract was unsatisfactory.

A routine bimonthly urinalysis is another precautionary measure instituted in this experimental study, since other sulfonamides are known to cause renal impairment. So far, no evidence of kidney irritation or damage has been demonstrated by the routine urinalyses, which are supplemented by occasional renal function tests whenever deemed indicated. Toomey and Tokacs (*6*) were not successful in attempts to produce urinary concretion in monkeys by intravenous injections of promin doses six times as large as those recommended for human beings.

After hemolysis, the most important toxic reaction was the development of an allergic dermatitis. This generally manifested itself as a diffuse maculopapular eruption which was accompanied by intense itching. Dermatitis medicamentosa is, of course, a cause for temporarily discontinuing promin therapy. In the majority of these allergic patients, desensitization is feasible. After the eruption has completely disappeared, promin is resumed in minute doses, 0.1 gm., intravenously. By gradually increasing the dose over a period of approximately one month, it is possible to arrive at therapeutic doses of 2 gm. daily without further allergic reactions. In some cases full doses of 5 gm. are eventually reached without a recurrence of dermatitis.

Allergic dermatitis occurred in 16 percent of the patients under study. Two-thirds of these have been desensitized at present. In

only 3 percent of cases the procedure proved entirely unsuccessful; the others are in the process of desensitization.

Another manifestation is allergic rhinitis, which developed in one patient. After several months the sneezing episodes following each injection of promin ceased.

Other untoward reactions, headaches and nausea, are generally mild and ephemeral. Nausea occurred in 35 percent of cases. It is transitory in nature and can be prevented by injecting the drug more slowly. Vomiting followed nausea in only 7 percent of cases. It also responds to slower injection, up to 1 minute being required to administer 5 gm. of promin intravenously. Several patients complained of headaches, which were never severe.

An increase in erythema of leprous plaques was noted in 3 percent of the cases. This accompanied the first few weeks of treatment and gradually subsided. Its cause is unknown. Acute leprae reactions with fever and the appearance of erythema nodosum occurs less frequently with promin than with most previous experimental treatments or than with the routine chaulmoogra oil injections. It was the cause of discontinuing promin therapy in only four cases.

An exacerbation of an iridocyclitis occurred in 10 percent of cases. In all of them the patient had experienced frequent previous attacks of iridocyclitis. This drug seems temporarily to increase the severity of the ocular inflammation, which is generally followed by improvement. In only one patient the exacerbation of iridocyclitis initiated by promin persisted longer than 1 month.

A generalized lymphadenitis was another unusual toxic manifestation which occurred in one patient. Reduction of the dose of promin to 1 gm. resulted in the subsidence of the glandular enlargement.

CLINICAL MATERIAL

No attempt was made to select minimal or moderately advanced cases with favorable prognosis. Thus only a few cases of neural and maculoanesthetic types are included in the study. All patients treated were bacterioscopically positive at onset and many had never had a negative bacteriologic report during the entire previous period of hospitalization. Many patients volunteering for treatment had far advanced lepromatous and mixed types of leprosy with poor prognosis. The disease in the majority of cases was showing a definite trend toward aggravation before the institution of promin therapy. Several cases were selected because of certain complications which it was thought might be favorably influenced by the promin. Among these important complications were: Leprous keratitis and iridocyclitis, with pending loss of vision in some cases; leprous rhinitis with ulcerations, repeated epistaxis and partial obstruction of nares;

leprous laryngitis with threatening suffocation; chronic leprous ulcerations; and lepromatous lesions and ulcers of the tongue, palate, gums, and lips, which usually respond poorly to other forms of treatment. The effects of promin in these complications of leprosy have, for the most part, been good.

Patients with eye, nose, and throat complications were examined before and during the course of treatment in the eye, ear, nose, and throat clinic, and those with oral lesions were examined in like manner in the dental clinic.

The eye, ear, nose, and throat specialist (J. F. D.) reports that many patients under promin therapy showed a marked improvement in nasal breathing. The initial examination in these patients reveals ulcerations of the nasal mucous membrane and excessive mucous secretion, which on drying and crusting produces blockage of the nasal passages. There is also a tendency to frequent epistaxis. After a course of promin it is observed that the ulcerations, which are probably due to secondary infection, heal, the excessive secretion and crust formation subside, and nasal bleeding ceases.

Another observation is that promin seems to benefit eye complications of leprosy. It is noted that patients on promin therapy do not have so many attacks of acute iridocyclitis as formerly. Two patients have shown by slit lamp examination that leprous punctate keratitis has disappeared to a considerable extent.

Objective improvement in vision has been marked in only one patient. This patient started with only light perception and projection in one eye, the other being totally blind. Shortly after the institution of promin parenterally, the acute iridocyclitis and edema of the cornea gradually improved. This continued until on the last examination it was found that he had recovered 20/100 vision in his good eye.

Many patients with advanced lepromatous and mixed leprosy show evidence of leprous laryngitis. The symptoms are huskiness of voice, vocal weakness, dryness of the throat with unproductive cough, and finally attacks of respiratory difficulty. Six patients with advanced leprous laryngitis were started on promin intravenously, and all of them improved, especially in the quality of their voices and the restoration of comfortable respiration. It is felt that two of these patients escaped a proposed emergency tracheotomy because of the beneficial relief attributable to promin therapy.

In the dental clinic it was noted that in several patients leprous lesions of lips, tongue, gums, and hard and soft palate have diminished and in four patients completely disappeared after prolonged treatment with promin. Some mucosal ulcerations of the hard and soft palate and of the lips have healed under the influence of promin.

CASE REPORTS

A brief summary of the progress of patients having taken at least 12 months of promin treatment is given in the following case reports:

Case 869.—White male, 28 years of age, is a moderately advanced lepromatous (nodular) case of 12 years' duration. There was little previous improvement during 9 years of hospitalization. A total of 2,030 gm. of promin was given intravenously during 26 months. The average daily dose, including rest periods, was 2.6 gm. After 6 months of treatment there was a gradual disappearance of discrete nodules of face and torso. At present the patient appears entirely free of leprous lesions. The monthly skin smears became bacteriologically negative after 2 years of treatment. An occasional acid-fast bacillus was found in one subsequent skin smear. Photographic confirmation of improvement is evident.

Case 864.—A 36-year-old white male with far-advanced lepromatous (nodular) leprosy of 12 years' duration had shown no recent advance in the disease prior to promin therapy. He was given 1,375 gm. intravenously during a period of 26 months. The daily dose averaged 1.7 gm. including rest periods. These rest periods and hematopoietic drugs were necessary to combat toxic hemolytic anemia. The erythrocytes varied from 3.02 to 4.67 million during the course of treatment. It was observed that facial nodules definitely retrogressed in size and prominence. This improvement started gradually after about a year's treatment and has been progressive. A troublesome nasal obstruction secondary to leprous rhinitis has apparently completely cleared up. General improvement is shown in the patient's ability to play baseball this season for the first time in 3 years.

Case 714.—A white male, 23 years of age, with far-advanced mixed type of leprosy showed a progressive aggravation of the disease during the 13 years prior to treatment with promin. The course of treatment, of 24 months' duration, has consisted of 1,819 gm., averaging 2.5 gm. daily including rest periods. Several chronic ulcers of the legs have healed, as well as a few small ulcers of the face and hands. Nasal obstruction complicating a leprous rhinitis has been relieved. The patient has greater energy and stamina, but there is no definite objective improvement in leprous lesions.

Case 1206.—White male, 59 years old, has a far-advanced mixed type of leprosy of 9 years' duration. He was getting worse before the onset of the present treatment. A total of 1,814 gm. of promin was injected intravenously during a period of 24 months, an average of 2.8 gm. daily including rest periods. There were very extensive chronic ulcerations of the extremities. These have all healed with the exception of two leg ulcers which are small at present. Nasal obstruction and bleeding, symptoms of leprous rhinitis, are relieved. Previous to promin therapy this patient was confined to the infirmary because of general weakness and laryngeal leprosy with threatened suffocation. An emergency tracheotomy seemed indicated. He is now ambulatory with laryngeal condition improved. Improvement in this elderly patient is definite.

Case 661.—A white female, 27 years old, with moderately advanced lepromatous (nodular) leprosy of 15 years' duration was showing no evidence of improvement at the time of onset of the present treatment. Promin intravenously was given for 19 months, totaling 1,265 gm. Including rest periods, the average daily dose was 2.2 gm. Definite objective improvement is noted. Nodules on arms and legs are smaller and flatter. A few nodules have disappeared, leaving a brownish pigmentation. Improvement has been consistent to date.

Case 1229.—A colored male, 43 years of age, was under previous routine treatment for 6 years without any definite improvement. The disease is a moderately advanced mixed type of leprosy. Present treatment totals 717 gm. of promin

given during the course of 18 months for an average daily dose of 1.3 gm., counting the rest periods. Promin was at first administered orally, but toxic reactions prevented its continuation by this route. The greater part of the drug was administered intravenously. The first bacteriologically negative skin smear was recorded after 1 year of treatment. Because the patient disliked daily injections, sulfathiazole was finally substituted for promin. The manifestations of leprosy have gradually receded. There has been one skin smear showing an occasional acid-fast bacillus since the first negative report, but subsequent skin smears have again reverted to negative. It is felt that promin is responsible for the definite objective improvement in this case.

Case 1366.—White male, 38 years of age, has suffered from mixed type of leprosy of a moderately advanced stage for 13 years. The disease had recently become worse. The course of intravenous promin therapy was of 19 months' duration with short intervals of rest. A total of 2,011 gm. was given for an average of 3.5 gm. daily. This has resulted in a slight decrease in the size and elevation of the nodules of the face, chest, and arms. There has also supervened a marked increase in physical capacity for work. Improvement is slight in this patient.

Case 1294.—White male, 34 years of age, has had leprosy for 17 years. The disease was moderately advanced and predominantly lepromatous in type and considered stationary before starting treatment with promin intravenously. This treatment was administered for 17 months, during which time 1,523 gm. were injected, an average daily dose of 3 gm. There resulted a healing of leprous ulcers of the lips, mouth, and nose. Eight ulcerations of the legs, the largest 4 cm. in diameter and 2 mm. in depth, are also completely healed at present. Leprous infiltration of the face has diminished. During a rest period in December 1941 an erysipeloid reaction of the face developed and during a rest period in September 1942 a severe cystitis developed. Both conditions were relieved upon resumption of promin and have not recurred during the course of treatment. At one time granulocytopenia developed and the number of leukocytes dropped to a low of 3,000 with a polymorphonuclear count of 18 percent. This condition responded well to the temporary discontinuance of the drug and the injection of liver extract. The neutrophiles have remained within normal limits since then, in spite of resumption of full doses of promin. Improvement in this case seems objectively definite.

Case 1413.—White male, 57 years old, has had leprosy for 7 years. Prior to institution of promin therapy the disease had an unfavorable course and reached a moderately advanced stage of the mixed type. Promin was given irregularly because of poor veins. Orally it was found to produce too severe toxic reactions. For many months the patient received it by daily intramuscular injections in the buttock, which he tolerated in spite of the pain. In all 519 gm. were administered during a period of 17 months, averaging about 1 gm. daily. Poor veins and painful intramuscular injections were the cause for substituting sulfathiazole orally for promin. Under these treatments, skin infiltrations subsided and large ulcers of the lower extremities healed partially. The patient has finally succeeded in obtaining two successive negative bacteriologic skin smears at monthly intervals. The contribution of promin toward these negative tests, which occurred 5 months after the treatment was changed to sulfathiazole, is questionable. For this reason this case is tabulated as stationary in the following table.

Case 1078.—White male, 41 years of age, has moderately advanced lepromatous (nodular) leprosy of 9 years' duration. His condition had been stationary for a year previous to onset of promin therapy. This treatment consisted of 1,121 gm.

of promin given intravenously for a period of 16 months. In spite of several interruptions, because of multiple operations for a squamous carcinoma of the nose, the daily dose averaged 2.3 gm. It was observed that numerous nodules of the abdomen and arms became flattened or disappeared entirely, leaving small scars. During a prolonged period of cessation of treatment a few new nodules developed on the abdomen. These receded upon resumption of treatment. The patient at present has again been transferred to another hospital for further plastic operations on his nose. It is felt that improvement in this case is objective and definite, although not continuous due to frequent interruptions in treatment.

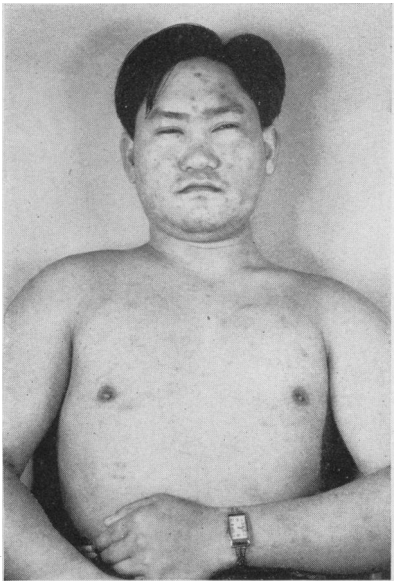
Case 953.—White male, 29 years of age, has had leprosy for 10 years. The disease progressed unfavorably prior to treatment. It is lepromatous (nodular) in type and moderately advanced. Treatment to the present has comprised the intravenous injection of 1,578 gm. of promin during a 16 months' period for an average of 3.2 gm. a day. Objective improvement is manifested by subsidence of lepromatous plaques of the face and a decrease in infiltration of the legs with some new growth of hair. The patient is encouraged over the results thus far obtained.

Case 1032.—White male, 28 years of age, has had leprosy for 10 years. The disease has grown progressively worse each year. At the start of promin therapy it had reached a far-advanced stage and was of mixed type. During the course of 16 months of treatment he was given 1,505 gm. of promin intravenously for an average of 3.1 gm. a day. The principal reason for starting treatment in this patient was the seriousness of ocular complications, leprous keratitis, and iridocyclitis, which were destroying his sight. Improvement in vision was definite. At the start of treatment the patient had to be led into the room for his injections. At present he reads 20/200 and Jaeger IV. Nasal discharge and epistaxis due to leprous rhinitis also ceased.

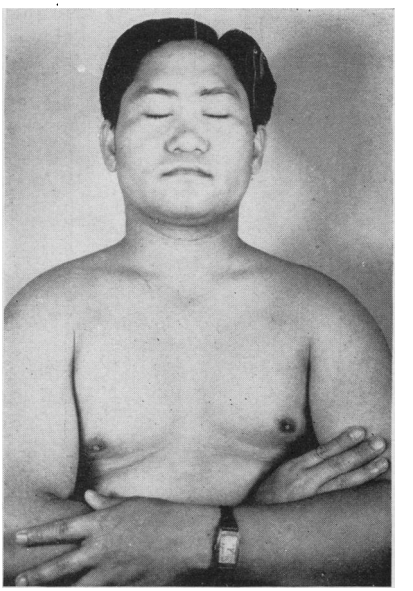
Case 1293.—White female, 34 years of age, has had leprosy for 17 years. At the time that promin therapy was started the disease was progressing unfavorably. Her case was classed as a moderately advanced lepromatous (nodular) type. At present she has had 15 months of treatment totaling 335 gm. and averaging only 0.7 gm. daily. The course and dosage were restricted because of allergic dermatitis which necessitated desensitization by gradually increasing doses commencing at 0.1 gm. intravenously. A tendency to anemia which responded only fairly well to liver, ventrex, and inorganic iron also resulted in frequent interruptions in the course of treatment. It is observed that some pigmented infiltrated lesions of the arms and thighs are subsiding under the influence of treatment. This improvement, however, has been gradual and is as yet slight, so that this case is recorded as still stationary.

Case 1195.—White male, 33 years of age, has had leprosy 12 years. The disease has shown no tendency to improve, and was a moderately advanced lepromatous (nodular) type at the start of the promin treatment. This therapy, started 14 months ago, amounts to 1,072 gm., the average daily dose being 2.5 gm. The manifestation of leprosy in this patient is a diffuse mottled infiltration of the skin of the entire body. Under promin therapy there has occurred a gradual but not a pronounced fading of these lesions. His condition is classed as stationary until and unless more marked improvement is noted.

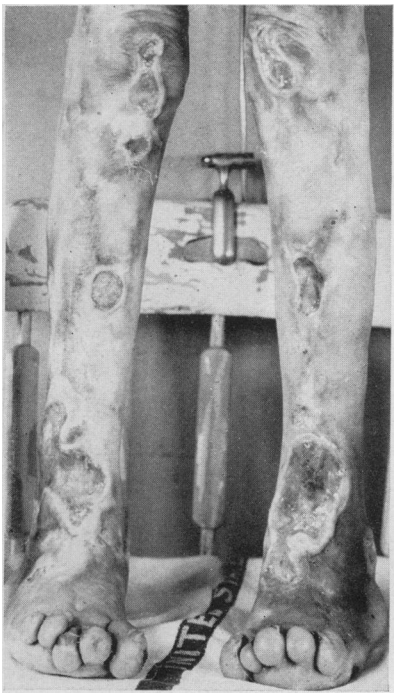
Case 575.—White male, 37 years of age, has had leprosy for 18 years. The disease is a far-advanced mixed type with total blindness. A threatened respiratory obstruction from advancing leprous laryngitis was the reason for starting promin therapy in this patient. Intravenous treatment so far has consisted of 1,251 gm. of promin during a 13 months' period, which averaged 3.2 gm. a day. The laryngeal condition has improved. A nasal mucosal leprosy which prevented free nasal breathing also responded favorably. Five leprous ulcerations of the extremities have healed. Leprotic skin infiltration has subsided and skin smears



Case 869. March 1, 1941, before promin treatment.

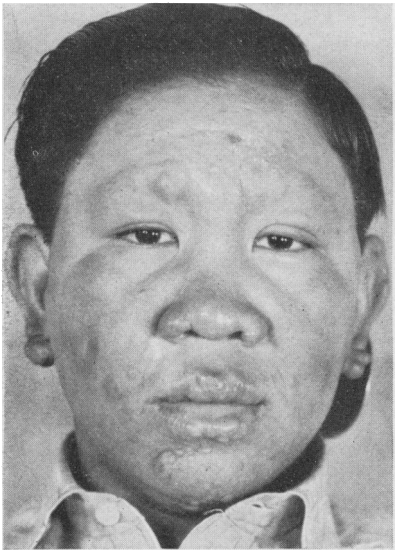


Case 869. April 2, 1943, 2 years after promin treatment was started.

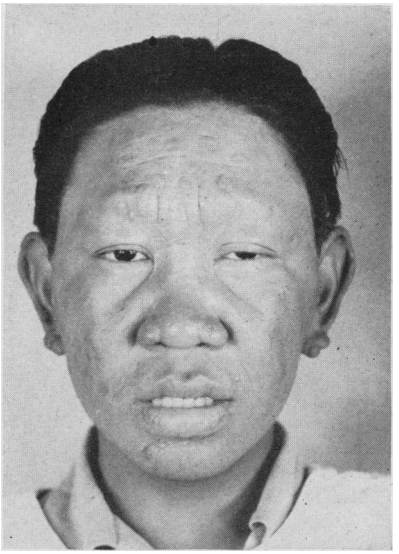


Case 1206. May 1, 1941, before promin treatment.

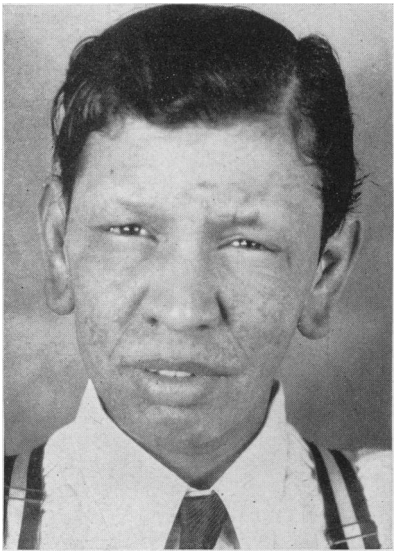
Case 1206. May 2, 1943, 2 years after promin treatment was started.



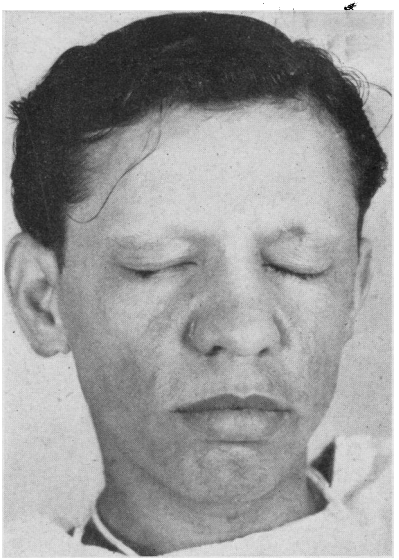
Case 918. April 1, 1942, before promin treatment.



Case 918. April 2, 1943, after 1 year of promin treatment.



Case 1481. February 1, 1942, before promin treatment.



Case 1481. April 2, 1943, after 1 year of promin treatment.

have become bacteriologically negative for the last 3 consecutive months. Improvement has been unmistakable.

Case 1033.—Chinese male, 25 years of age, has moderately advanced lepromatous leprosy of 8 years' duration. At present he has received 811 gm. of promin intravenously during 13 months, the average daily dose being 2.3 gm. Close examination shows no demonstrable effect of promin on the leprosy for either better or worse.

Case 576.—White male, 21 years of age, has suffered from leprosy for 15 years. The disease had become far advanced and of the mixed type before promin therapy was tried. This patient also had severe chronic nephritis. Promin was administered intravenously in moderate doses for 13 months, averaging about 1 gm. daily and totaling 391 gm. A marked leprous iridocyclitis subsided but there was no improvement of leprous keratitis noted. Visual acuity did not improve but frequent nocturia was lessened. Nitrogen retention was not materially altered but dropped 20 points since the last resumption of promin 6 weeks ago. This patient's condition is still serious and at present is considered worse than at the start of treatment.

Case 689.—White male, 49 years of age, who has had leprosy 18 years, was a far-advanced mixed type before starting on promin. During 13 months 1,325 gm. were administered intravenously for an average daily dose of 3.3 gm., including the rest periods. Rapidly failing vision due to leprous keratitis and iridocyclitis was the reason for trying promin. Iridocyclitis subsided but the keratitis remained the same. Nasal obstruction due to a leprous rhinitis is greatly relieved. Multiple ulcers of the legs have healed under the influence of promin. Two periods of interruption of treatment were necessary for excision of a squamous cell carcinoma of lower lip and a subsequent plastic repair. Improvement in this case is regarded as definite, although most of it may be attributed to clearing up of secondary infections.

Case 1148.—White male, 39 years of age, has had leprosy for 10 years. The disease was becoming worse and was of a moderately advanced mixed type at onset of promin therapy. Course of treatment consisted of 1,126 gm. of promin intravenously during a period of 12 months, the average daily dose being 3.1 gm. including days of rest. Leprous laryngitis was the reason for instituting treatment in this case. This manifested itself by hoarseness and a tendency to aphonia and dyspnoea. These symptoms were favorably influenced by promin. Scleroderma of lower legs diminished, and ulcers healed. Nodules on the legs became smaller.

Case 1196.—White male, 29 years of age, who has had leprosy 8 years, had shown no definite change previous to promin treatment. The disease was moderately advanced and lepromatous (nodular) in type. He received a total of 856 gm. of promin intravenously during 12 months, an average daily dose of 2.3 gm. Improvement is manifested in subsidence of skin infiltration and nodules of ear lobes. Objective improvement is reflected in the report of the patient's first negative skin test after 11 months on promin therapy.

Case 918.—Filipino male, 19 years of age, has had leprosy for 12 years. The disease is moderately advanced and of mixed type. At onset of promin therapy prognosis seemed poor, as the disease was progressing unfavorably. A total of 889 gm. of promin was administered intravenously during 12 months, which is an average daily dose of 2.4 gm. A decrease in the amount of infiltration and nodulation of the face and body has become evident. There is also a moderate lessening of scleroderma of the legs. In spite of this improvement, the patient has suffered several acute lepra reactions with erythema nodosum and has lost 5 pounds in weight.

Case 1399.—White male, 20 years of age, has had leprosy for 4 years. The disease is maculo-anesthetic in type and of a moderately advanced stage. Promin therapy was commenced 12 months ago. At first it was given orally, but this method of administration had to be discontinued because of a gastro-intestinal disturbance and the development of hemolysis. The greater part of the 848 gm. of promin was given intravenously, an average of 2.2 gm. daily including rest periods. Macules of the body have faded to some extent. Nasal obstruction was markedly alleviated. In this case in addition to parenteral therapy a 5-percent solution of promin was used as a nasal spray. Skin smears are showing a smaller number of acid-fast bacilli, and the last nasal smear is reported negative.

The following table is a summation of the results of intravenous promin therapy in the patients whose case histories are reported here, each of whom has taken at least 12 months of treatment.

TABLE 1

Type	Number	Improved	Stationary	Worse	Bacteriologic reversion from positive to negative
Mixed, far advanced	6	3	2	1	1
Mixed, moderately advanced	5	4	1	0	1
Lepromatous, far advanced	1	1	0	0	0
Lepromatous, moderately advanced	9	6	3	0	3
Neural, moderately advanced	1	1	0	0	0
Total	22	15	6	1	5

Not included in these case reports or in table 1 are 46 additional patients who have taken a shorter course of promin intravenously. Some of them are beginning to show signs of improvement, and a few have reverted from a positive to a negative bacterioscopy. The duration of treatment in this more recent group of patients varies from 2 to 11 months and averages 8 months. The preliminary results of intravenous promin therapy in this group are briefly indicated in table 2. Also shown in this table are the number of patients in whom bacteriologic tests became negative and those in whom treatment was discontinued for one reason or another.

TABLE 2

Type	Number	Objective improvement	Stationary	Worse	Bacterioscopy negative	Treatment discontinued
Mixed, far advanced	4	1	3	0	0	2
Mixed, moderately advanced	14	6	6	2	1	6
Lepromatous, far advanced	5	3	2	0	1	0
Lepromatous, moderately advanced	13	8	4	1	2	2
Lepromatous, minimal	4	3	1	0	1	1
Neural, moderately advanced	5	4	1	0	2	0
Neural, minimal	1	1	0	0	0	0
Total	46	26	17	3	7	11

In these more recently treated cases it can be seen that an attempt was made to select a more favorable and less advanced type of disease.

There were 16 patients altogether in whom treatment was discontinued for various reasons. This number includes a few patients taking less than 2 months' treatment, who are not otherwise included in this report. The reasons for discontinuing treatment were as follows: Refusal of patient to cooperate, 5; repeated acute leprae reactions with erythema nodosum, 4; patients absconding (improved nodular cases), 2; exfoliative dermatitis, 1; leucopenia, 1; previous advanced nephritis, 1; and increased icteric index in a patient with previous hepatitis due to sulfanilamide, 1.

The following table gives pertinent data on all cases which reverted from a positive to a negative bacterioscopy under the influence of promin therapy.

TABLE 3

Registration number	Months of treatment before first negative report	Amount of promin required before first negative report, in grams	Number of negatives	Registration number	Months of treatment before first negative report	Amount of promin required before first negative report, in grams	Number of negatives
869	24	1,926	1	1417	8	365	1
1229	13	298	1	1500	8	427	1
1413	24	[1] 519	2	817	7	794	1
575	9	948	3	1123	6	692	3
1196	11	756	1	1492	6	240	3
1343	10	485	1	1514	6	373	1

[1] In addition to 233 gm. of sulfathiazole.

Because leprosy is a chronic disease subject to periods of spontaneous remissions more or less prolonged, it may be difficult to determine whether improvement under any new experimental treatment is entirely due to the remedy under study or not. However, the writers feel that the large number of patients showing improvement in contrast to the small number in whom unfavorable progress was made under promin therapy cannot well be explained on the basis of spontaneous improvement alone.

To test this impression a control experiment was undertaken with a prominlike drug, Internal Antiseptic 307, which was administered orally in capsules to one group of patients while a placebo, lactose with a trace of quinine, in similar capsules was given to another group of patients. The placebo was similar in appearance and taste to the active drug, and none of the patients taking it suspected that they were not being actively treated. Internal Antiseptic 307 chemically is sodium-4,4'-diaminodiphenylsulfone-2-acetylsulfonamide. Being closely related chemically to promin, it was found to have a similar action in leprosy. It was chosen for oral administration instead of promin, which is too toxic when given by mouth. Internal Antiseptic 307 is a Parke Davis product and was furnished gratis by this firm for this experiment.

There was less objection in this institution to the administration of a placebo orally than by the intravenous route, as it would have been more difficult to manage a control series of patients on intravenous injections without arousing their suspicion. The group of patients taking the I. A. 307 and those of the control group were closely matched as to type and stage of the disease. The dosage of the drug and of the placebo were the same, varying from 5 to 15 gr. daily and averaging 10 gr. It was necessary to use these small doses of I. A. 307 to obviate toxic reactions, since this drug has cumulative properties. The patients of both groups were handled in exactly the same manner. During the course of treatment complete blood counts and urinalyses were done every 2 weeks on all patients of both groups. Antianemic therapy was administered to patients of either group whenever indicated by the laboratory findings.

After a period of over 8 months it became apparent that there was a difference in the condition of the two groups of patients. While the course of the disease continued unabated in the control group, it was checked in a considerable percentage of the treated patients. Complications of the disease, such as ulcerations, rhinitis, laryngitis, and iridocyclitis, frequently improved under I. A. 307 but were unaffected in the control patients. A comparison of the results after more than 9 months of treatment is given for the two groups in table 4. In this table under complications are included: chronic ulcerations, leprous rhinitis, leprous laryngitis, and iridocyclitis.

TABLE 4

	Internal Antiseptic 307	Control
Number of patients	20	20.
Improvement in leprosy	6 (30 percent)	1 (5 percent).
No change in leprosy	5 (25 percent)	9 (45 percent).
Leprosy worse	3 (15 percent)	5 (25 precent).
Improvement limited to complications	5 (25 percent)	0.
Complications worse	1 (10 percent)	5 (25 percent).
Bacterioscopy becoming negative	2	0.

Data in the above table seem to indicate that improvements in leprosy under promin and prominlike drugs cannot be attributed only to spontaneous remissions in the course of the disease.

CONCLUSIONS

Promin is the sulfonamide drug which thus far seems to possess to the greatest extent some chemotherapeutic properties against leprosy.

While no direct evidence of a specific bacteriostatic or bacteriocidal action against M. leprae has been demonstrated, it has been observed that promin appears capable of inhibiting the progress of leprosy in

a considerable percentage of cases. As yet no case of leprosy has become arrested under its influence.

It is found that promin can be safely administered intravenously for prolonged periods, provided the blood and urine are examined frequently. When these precautions are taken, toxic manifestations are relatively rare and mild. The most important of them, hemolysis, if recognized early, is usually controllable and not a cause for discontinuance of treatment.

Further experimental and clinical studies on the treatment of leprosy with promin must be conducted before more definite conclusions can be drawn as to its therapeutic value.

It is not claimed that promin is a specific for leprosy, but in the writers' estimation it is an advance in the right direction in the therapy of this disease.

Promin can be considered to have opened a new avenue in the chemotherapy of the mycobacterial diseases. It is hoped that further synthesis of sulfa compounds may produce a substance which will succeed in saving countless lives in this still dark field of medicine.

ACKNOWLEDGMENTS

The writers wish to give credit to Dr. F. D. McCreary, at present a major in the Medical Corps of the United States Army, for the administration of promin during the first 5 months of this study, his interest in the work, and his notes and observations of cases while stationed at the United States Marine Hospital, Carville, La. They also wish to express their appreciation to Sister Hilary Ross and Joseph Q. Heplar for their cooperation in the extensive laboratory work carried on in connection with this experimental study, and to Sister Hilary Ross for the estimation of the promin and Internal Antiseptic 307 concentrations in the blood.

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EXPERIMENTAL TRANSMISSION OF THE RICKETTSIAE OF THE SPOTTED FEVERS OF BRAZIL, COLOMBIA, AND THE UNITED STATES BY THE ARGASID TICK *ORNITHODOROS NICOLLEI* [1]

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The transmisson of the rickettsiae of the spotted fevers by *Ornithodoros parkeri* has been reported (*1*) and attention has been called to the potential importance of this tick as a vector in nature in the United States. The results of similar studies with a Mexican species, *O. nicollei*, are now presented. In all experiments ticks in the first nymphal stage were used for the infective feeding and blood from guinea pigs infected with spotted fever of the United States was used for the immunity tests.

SPOTTED FEVER OF BRAZIL

Ticks used in experiments 1, 2, and 3 were given their infective feeding on the same guinea pig host infected with the spotted fever of Brazil; 25 first nymphs engorged on the second day of fever, 25 on the third, and 25 on the fourth. Five days after the infective feeding, 5 engorged nymphs from each lot were ground in saline and injected into a guinea pig. None of the 3 recipient guinea pigs showed fever. Further testing of the ticks from experiments 1 and 3 by feeding and by subsequent injection indicated that none of the ticks had acquired the infective agent. In experiment 2, 1 guinea pig became infected at the second and 1 at the sixth test feeding.

In experiments 4 and 5, 44 and 76 ticks, respectively, engorged on a guinea pig on the third and fourth days of fever. Directly after engorgement 5 ticks from each group were ground in saline and injected into 2 fresh guinea pigs. One guinea pig died following 7 days of fever. The spleen was three times normal, adhesions of the tunica vaginalis were present, and there was extensive scrotal sloughing. The other guinea pig reacted with 9 days of fever and was subsequently immune to spotted fever. None of the remaining ticks were shown to be infective at the first test feeding. At the second test feeding 3 of 4 guinea pigs were infected by ticks from the first lot and 4 of 5 by ticks from the second lot. At the third test feeding all 13 guinea pig hosts became infected. Six showed scrotal swelling and all were immune to spotted fever. As the result of continued test feedings, 45 guinea pigs were infected. Seventeen reacted with scrotal edema, 5 died, and the remainder were shown to be immune. The prefebrile periods varied from 3 to 7 days, with 5 days in a majority

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

of cases; the febrile periods from 4 to 10 days, and in 42 of the 45 guinea pig hosts the temperature reached 41.0° C. or higher. The onset of the febrile periods was abrupt and termination in surviving guinea pigs was by lysis.

F1 generation: Transmission through the egg was demonstrated in experiments 2, 4, and 5. At the larval feeding 6 guinea pigs became infected. Five of these showed scrotal edema and 1 on which 11 larvae engorged showed extensive scrotal sloughing. Four died of spotted fever; the 2 surviving guinea pigs developed pneumonia following the immunity test. The prefebrile periods were unusually short, varying from 2 to 4 days. Thus far, all groups of ticks shown to be infective as nymphs were also shown to be infective as larvae. In reported experiments with *O. parkeri* (*2*) it was shown that larvae may infect the host but that as a rule infectivity is not apparent before the first nymphal feeding.

SPOTTED FEVER OF COLOMBIA

Twenty-five first nymphs engorged on a guinea pig infected with the spotted fever of Colombia on the second day of fever and 25 on the third day of fever. Five days after the infective feeding 5 ticks from each lot were ground in saline and injected into 2 fresh guinea pigs. The recipient guinea pigs died of spotted fever on the tenth and twelfth days, respectively. The remaining ticks from lot 1 were shown to be infective at the second, fifth, and seventh test feedings, and from lot 2 at the fifth and sixth test feedings. Seven host guinea pigs became infected. Two reacted with scrotal edema, 2 died, and the surviving 5 were immune to spotted fever.

F1 generation: Four larvae from an infective female engorged on a guinea pig. There was a prefebrile period of 4 days, with death on the eighth day of fever. The spleen was four times normal, the testes and adnexa were deeply injected, and there was a slight scrotal sloughing.

SPOTTED FEVER OF THE UNITED STATES

Twenty and 25 first nymphs, respectively, engorged on a guinea pig infected with spotted fever of the United States on the fourth and fifth days of fever. Five days after the infective feeding 5 engorged nymphs from each lot were ground in saline and tested for infectivity by injection. The guinea pig receiving nymphs engorged on the fourth day of fever died of spotted fever 13 days later, while the guinea pig that received ticks engorged on the fifth day of fever showed no evidence of infection. None of the remaining ticks were shown to be infective at the first test feeding. At the second test

feeding the 15 remaining ticks from the first lot caused 9 days of fever and subsequent immunity and 18 surviving ticks from the second lot infected 2 of the 3 guinea pig hosts. At the third and fourth test feedings 7 additional guinea pigs became infected. Four showed scrotal edema and 1 extensive scrotal sloughing. Four died and the remaining 3 were shown to be immune. As it was necessary to terminate the experiment, transmission to the next generation was not demonstrated.

DISCUSSION

Spotted fever has not been reported from Mexico. However, it hardly seems credible that a disease present in southwestern Canada, throughout the United States, in Colombia, and Brazil should be entirely absent from Mexico and Central America. Both endemic and epidemic typhus are present in Mexico, and in this connection it should be remembered that only recently spotted fever and endemic typhus have been differentiated in our own southern States.

Results of these experiments show that *O. nicollei*, reported as present in native houses and parasitic on dogs and man in Mexico, is a very efficient vector in the laboratory, and, of the numerous species of *Ornithodoros* tested, is equalled as a transmitter only by *O. parkeri* from the western States.

SUMMARY

The argasid tick *Ornithodoros nicollei* engorged in the first nymphal stage on guinea pigs infected with the spotted fevers of Brazil, Colombia, and the United States, respectively, subsequently transmitted the specific agents by feeding on fresh guinea pigs. The ticks remain infective throughout the nymphal and adult stages and transmit the rickettsiae of Brazilian and Colombian spotted fever through the egg to the next generation.

Observations suggest that larvae may be the most efficient transmitters as they attach firmly while ticks in the later stages are easily dislodged. Furthermore, evidence of infection is apparent earlier following the larval feeding than following feeding in the later developmental or adult stages.

As this tick is parasitic on man and dogs, it may be considered a potential vector in Mexico.

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PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

October 10–November 6, 1943

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended November 6, 1943, the number reported for the corresponding period in 1942, and the median number for the years 1938–42.

DISEASES ABOVE MEDIAN PREVALENCE

Meningococcus meningitis.—The number of cases of meningococcus meningitis rose from 696 during the preceding 4-week period to 855 during the 4 weeks ended November 6. An increase of this disease is normally expected at this time of the year, but the rate of increase during the current period was considerably above normal, especially in regions along the Atlantic Coast and in the East North Central and South Central regions. States reporting rather sharp increases during the current 4-week period (figures for preceding 4 weeks in parentheses) are as follows: New York 134 (89), Pennsylvania 62 (48), Ohio 45 (27), Missouri 29 (17), Virginia 33 (16), Tennessee 22 (13).

Compared with preceding years the incidence for the country as a whole was the highest on record for this period. The number of cases (855) was 3.6 times last year's figure for these same weeks and 6.3 times the 1938–42 median. In each geographic region except the West North Central the current incidence was the highest in the 15 years for which these data are available. During the epidemics of 1928–30 and 1935–36 the cases for this period totaled 384 and 273, respectively.

Poliomyelitis.—The number of cases of poliomyelitis dropped from 3,032 during the 4 weeks ended October 9 to 1,544 during the current 4-week period. A decline in the incidence was reported from all regions of the country. Compared with preceding years, however, the incidence remained at a relatively high level, the number of cases being 2.5 times that for the corresponding period in 1942 and 1.3 times the 1938–42 median. In the South Atlantic and East South Central regions the incidence was below the normal seasonal expectancy but in all other regions the number of cases was considerably above the median, the number of cases ranging from 1.5 times the median in the North Central regions to almost 7 times the median in the Mountain and Pacific regions.

Influenza.—For the 4 weeks ended November 6 there were 5,581 cases of influenza reported, as compared with 5,404 in 1942 and a 1938–42 median of 3,836 cases. While the current incidence closely approximated that of last year, it represented an increase of about 45 percent over the normal seasonal expectancy. However, the increase appeared to be due largely to the high incidence reported in the State of Texas; more than one-half of the total number of cases reported occurred in that State. In other regions the numbers of cases either closely approximated the median or fell considerably below it.

Measles.—The number of cases of measles was above the normal seasonal expectancy in all regions except the Mountain and Pacific. The number of cases (9,773) reported for the country as a whole represented an increase of more than 45 percent over the number for the corresponding period in 1942, which number (5,283) also represented the 1938–42 median for this period. The disease was most prevalent in the Atlantic Coast and North Central regions; in both of the latter regions the number of cases was more than 5 times the median.

Scarlet fever.—The incidence of scarlet fever was also relatively high, 9,981 cases being reported for the current period, as compared with a 1938–42 median of 8,900 cases. In the New England and Pacific regions the incidence was about twice the normal expectancy, the Mountain region reported a 50-percent increase, and other regions from 10- to 20-percent increases. The current incidence is the highest for this period since 1938, when approximately 11,000 cases were reported.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—For the 4 weeks ended November 6 there were 1,665 cases of diphtheria reported. The 1938–42 median for this period was 2,484 cases. The Pacific region reported an increase of cases over the median and in the New England and West North Central regions the incidence was about normal; in other regions the numbers of cases were relatively low.

Smallpox.—This disease continued at a comparatively low level. There were 20 cases reported for the current period, as compared with 45 for the corresponding period in 1942 and the 1938–42 median was 77 cases. The incidence was the lowest on record for this period.

Typhoid fever.—The incidence of typhoid and paratyphoid fever was the lowest on record for this period. The number of cases (414) reported for the 4 weeks ended November 6 was less than 70 percent of last year's figure and less than 50 percent of the 1938–42 median for the same weeks. In the New England region the incidence was about normal, but in all other regions the numbers of cases were considerably below the median.

Number of reported cases of nine communicable diseases in the United States during the 4-week period October 10–November 6, 1943, the number for the corresponding period in 1942, and the median number of cases reported for the corresponding period, 1938–42

Division	Current period	1942	5-year median	Current period	1942	5-year median	Current period	1942	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	1,665	2,484	2,484	5,581	5,404	3,836	9,773	5,283	5,283
New England	25	24	27	17	25	7	982	1,125	725
Middle Atlantic	83	136	138	46	75	50	1,389	926	862
East North Central	230	265	265	105	214	214	3,435	651	651
West North Central	133	117	128	31	50	50	1,905	297	352
South Atlantic	476	946	1,038	1,612	1,874	1,499	954	111	412
East South Central	271	363	363	240	293	241	158	80	80
West South Central	234	432	432	2,977	2,250	1,127	186	93	128
Mountain	53	73	73	396	448	395	413	745	536
Pacific	160	128	106	157	175	124	351	1,255	1,078
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	855	237	135	1,544	600	1,163	9,981	8,900	8,900
New England	91	31	8	123	34	29	830	863	456
Middle Atlantic	231	85	27	155	99	99	1,562	1,382	1,382
East North Central	170	27	25	319	130	215	2,675	2,347	2,355
West North Central	42	7	9	165	109	109	1,156	1,039	1,039
South Atlantic	129	39	26	26	38	69	1,506	1,434	1,216
East South Central	64	16	19	20	34	58	601	756	729
West South Central	37	5	8	115	64	49	320	355	350
Mountain	18	1	3	127	19	19	386	196	257
Pacific	73	26	7	494	73	73	945	528	528
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	20	45	77	414	599	888	9,242	10,795	12,053
New England	0	0	0	27	30	25	778	1,349	1,041
Middle Atlantic	0	0	0	52	77	120	1,909	3,357	3,357
East North Central	7	4	24	51	129	124	2,416	2,782	3,656
West North Central	6	14	20	22	20	59	679	446	533
South Atlantic	2	8	0	92	120	212	1,432	857	1,130
East South Central	3	2	5	39	63	128	396	291	463
West South Central	1	9	9	74	99	164	379	529	387
Mountain	1	2	4	30	42	56	452	292	334
Pacific	0	6	6	27	19	52	801	892	892

[1] Mississippi, New York, and Pennsylvania excluded; New York City included.
[2] Mississippi excluded.

Whooping cough.—For the current 4-week period there were 9,242 cases of whooping cough reported, as compared with 10,795 during the corresponding period in 1942 and a 1938–42 median of approximately 12,000 cases. The South Atlantic, West North Central, and Mountain regions reported a few more cases than have normally been reported at this season but in all other regions the incidence was below the normal seasonal level.

MORTALITY, ALL CAUSES

For the 4 weeks ended November 6 there were approximately 34,500 deaths from all causes in the group of large cities reporting to the Bureau of the Census. The number was about 6.6 percent more than the average for the corresponding weeks of the 3 preceding years.

The monthly death rate from all causes among persons in the industrial department of the Metropolitan Life Insurance Co. has been above the corresponding month of the preceding year for every month from October to September, inclusive, the latest data available. The average of the excesses in the rates for these 12 months over the months of the preceding year was 8.3 percent.

DEATHS DURING WEEK ENDED NOVEMBER 13, 1943

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

	Week ended Nov. 13, 1943	Corresponding week, 1942
Data for 90 large cities of the United States:		
Total deaths	8,540	8,629
Average for 3 prior years	8,377	
Total deaths, first 45 weeks of year	407,248	378,437
Deaths under 1 year of age	621	621
Average for 3 prior years	563	
Deaths under 1 year of age, first 45 weeks of year	29,227	26,161
Data from industrial insurance companies:		
Policies in force	66,035,045	65,244,143
Number of death claims	12,330	10,393
Death claims per 1,000 policies in force, annual rate	9.7	8.3
Death claims per 1,000 policies, first 45 weeks of year, annual rate	9.7	9.1

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 NOVEMBER 20, 1943

Summary

A total of 265 cases of meningitis was reported, as compared with 223 for the preceding week. The current incidence is approximately 9 times the 5-year (1938–42) median of 30 cases. The total number of cases reported since the beginning of the fourth quarter of the year is 1,534, as compared with a 5-year median of 233 for the same period.

Reports for the current week show increased incidence in all of the 9 major geographic areas except the Middle Atlantic and the West South Central. Increases were shown in 11 States which reported 7 to 24 cases each, representing all sections except the West South Central and Mountain States. In States reporting 6 or more cases, decreases were recorded in New Jersey, Missouri, and Virginia. New York reported 33 cases, the same number as for the preceding week. A total of 16,061 cases has been reported to date for the country as a whole as compared with 3,103 for the same period last year.

A further decrease was reported in the incidence of poliomyelitis. A total of 221 cases was reported, as compared with 243 for the preceding week and a 5-year median of 163. Only 7 States reported more than 6 cases each, as follows (last week's figures in parentheses): New York 12 (17), Illinois 24 (26), Kansas 11 (11), Texas 12 (9), Washington 30 (8), Oregon 17 (19), and California 54 (62).

A total of 11,843 cases has been reported to date, as compared with 3,833 for the same period last year and a 5-year median of 6,793 for the corresponding period.

Cumulative figures to date for other diseases included in the following table (last year's corresponding figures in parentheses) are as follows: Anthrax, 61 (72); diphtheria 11,921 (13,452); dysentery, all forms, 21,154 (18,551); infectious encephalitis, 623 (522); influenza, 95,943 (94,637); leprosy, 27 (43); measles, 591,941 (480,638); Rocky Mountain spotted fever, 432 (450); scarlet fever, 121,996 (110,559); smallpox, 676 (707); tularemia, 707 (772); typhoid and paratyphoid fever, 5,085 (6,303); endemic typhus fever, 3,931 (3,292); whooping cough, 164,249 (159,129).

Deaths recorded in 89 large cities of the United States for the week totaled 8,888 for the current week, as compared with 8,439 last week and a 3-year (1940–42) average of 8,515. The cumulative figure for the first 46 weeks of the year is 412,318, as compared with 384,588 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended November 20, 1943, and comparison with corresponding week of 1942 and 5-year median

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

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended		Median 1938–42	Week ended		Median 1938–42	Week ended		Median 1938–42	Week ended		Median 1938–42
	Nov. 20, 1943	Nov. 21, 1942		Nov. 20, 1943	Nov. 21, 1942		Nov. 20, 1943	Nov. 21, 1942		Nov. 20, 1943	Nov. 21, 1942	
NEW ENGLAND												
Maine	0	1	1	------	1	1	112	5	46	3	1	0
New Hampshire	0	0	0	------	------	------	0	30	4	0	0	0
Vermont	0	0	0	------	------	------	2	120	9	0	0	0
Massachusetts	14	1	5	------	------	------	224	261	219	16	4	3
Rhode Island	1	1	0	------	------	------	62	0	2	2	2	0
Connecticut	3	2	0	3	3	1	3	72	45	4	0	0
MIDDLE ATLANTIC												
New York	13	13	17	[1] 5	[1] 16	[1] 11	281	[1] 297	207	33	12	3
New Jersey	0	4	12	16	4	10	282	20	18	6	1	1
Pennsylvania	8	14	18	3	------	------	222	447	220	23	2	4
EAST NORTH CENTRAL												
Ohio	16	14	18	3	3	10	259	21	21	13	3	0
Indiana	20	11	13	9	22	4	111	16	18	5	0	0
Illinois	8	26	27	4	9	9	64	33	33	9	1	1
Michigan [2]	6	9	9	2	6	------	281	49	117	21	5	0
Wisconsin	4	2	2	18	28	28	329	66	98	4	0	0
WEST NORTH CENTRAL												
Minnesota	9	3	3	1	------	------	725	1	28	7	0	0
Iowa	2	4	4	------	4	2	96	28	28	2	0	0
Missouri	1	12	13	3	------	1	4	8	8	8	0	0
North Dakota	1	2	2	------	2	4	226	1	4	1	1	0
South Dakota	4	3	1	1	------	1	4	19	5	0	0	0
Nebraska	5	2	2	3	8	------	5	50	2	0	0	0
Kansas	10	8	6	9	1	4	9	28	22	0	2	0
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	6	1	0	3	1	0
Maryland [2]	6	17	14	2	4	7	21	21	21	7	3	0
District of Columbia	1	0	1	------	2	1	9	1	1	5	0	0
Virginia	12	25	35	168	157	148	62	6	37	10	3	2
West Virginia	5	9	12	------	25	13	50	4	17	2	0	0
North Carolina	27	49	63	1	9	7	68	2	98	9	0	1
South Carolina	8	28	24	295	439	306	6	5	5	1	1	0
Georgia	14	25	29	34	35	35	24	8	9	4	2	0
Florida	20	16	11	7	3	3	24	5	5	5	0	0
EAST SOUTH CENTRAL												
Kentucky	8	12	12	1	7	10	11	19	12	9	1	1
Tennessee	15	15	22	25	28	38	15	15	15	7	4	0
Alabama	25	15	27	60	53	55	67	2	8	3	1	2
Mississippi [2]	11	10	18	------	------	------	------	------	------	2	1	0
WEST SOUTH CENTRAL												
Arkansas	8	11	23	45	53	54	28	8	8	0	1	1
Louisiana	13	13	10	15	10	10	20	3	1	3	1	0
Oklahoma	2	17	22	39	65	57	13	2	5	0	1	0
Texas	43	58	58	716	553	247	63	7	14	2	0	0
MOUNTAIN												
Montana	5	2	2	5	------	------	85	7	9	0	0	0
Idaho	2	1	0	------	1	------	1	19	18	0	3	0
Wyoming	0	0	1	1	31	------	3	14	4	0	0	0
Colorado	11	14	14	30	39	22	46	7	22	0	0	0
New Mexico	0	1	1	19	1	1	0	8	8	1	0	0
Arizona	7	1	5	163	84	84	3	8	8	0	0	0
Utah [2]	0	0	0	6	------	6	3	188	23	4	0	0
Nevada	0	0	0	------	------	------	0	5	0	0	0	0
PACIFIC												
Washington	8	0	1	------	------	------	49	408	15	3	1	0
Oregon	2	0	3	3	17	12	23	189	19	4	0	0
California	30	22	22	19	46	46	64	39	162	24	6	1
Total	408	493	602	1,734	1,769	1,711	4,065	2,483	2,483	265	64	30
46 weeks	11,921	13,452	13,903	95,943	94,637	160,713	561,941	480,638	480,638	16,061	3,103	1,798

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended November 20, 1943, and comparison with corresponding week of 1942 and 5-year median—Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended		Median 1938–42	Week ended		Median 1938–42	Week ended		Median 1938–42	Week ended		Median 1938–42
	Nov. 20, 1943	Nov. 21, 1942		Nov. 20, 1943	Nov. 21, 1942		Nov. 20, 1943	Nov. 21, 1942		Nov. 20, 1943	Nov. 21, 1942	
NEW ENGLAND												
Maine	0	0	0	18	9	8	0	0	0	0	1	1
New Hampshire	2	0	0	10	4	7	0	0	0	0	1	0
Vermont	0	1	0	1	3	2	0	0	0	0	0	0
Massachusetts	4	1	1	187	245	123	0	0	0	5	0	1
Rhode Island	1	0	0	6	12	5	0	0	0	0	0	0
Connecticut	6	0	0	-39	38	35	0	0	0	1	0	2
MIDDLE ATLANTIC												
New York	12	2	6	290	240	236	0	0	0	7	8	8
New Jersey	0	3	3	98	39	85	0	0	0	4	3	3
Pennsylvania	3	2	8	179	136	189	0	0	0	6	4	10
EAST NORTH CENTRAL												
Ohio	4	0	7	288	169	210	0	0	0	2	2	10
Indiana	0	1	1	90	53	86	7	2	1	0	1	1
Illinois	24	11	11	115	162	250	0	0	1	0	3	3
Michigan [3]	4	1	5	129	93	178	0	0	3	3	2	2
Wisconsin	3	2	4	143	204	117	1	1	1	0	0	0
WEST NORTH CENTRAL												
Minnesota	1	3	3	56	47	64	0	0	2	0	2	0
Iowa	3	1	1	78	51	52	0	0	1	4	5	2
Missouri	1	3	2	49	64	64	0	0	1	0	0	2
North Dakota	0	0	0	9	11	16	0	0	0	0	0	0
South Dakota	0	0	0	12	16	16	0	0	0	0	0	0
Nebraska	0	4	2	17	15	17	1	1	0	1	0	1
Kansas	11	2	1	74	83	85	0	0	0	0	2	2
SOUTH ATLANTIC												
Delaware	0	0	0	7	10	9	0	0	0	1	0	0
Maryland [3]	2	0	1	32	25	40	0	0	0	1	3	4
District of Columbia	0	0	0	11	13	10	0	0	0	0	0	1
Virginia	0	0	2	44	84	79	0	0	0	2	1	8
West Virginia	0	1	1	79	45	67	0	0	0	0	0	5
North Carolina	0	0	2	123	85	85	0	0	0	2	2	2
South Carolina	1	2	2	12	21	21	0	0	0	1	2	3
Georgia	1	1	1	29	57	43	0	0	0	0	3	9
Florida	0	3	1	10	9	9	0	0	0	4	1	3
EAST SOUTH CENTRAL												
Kentucky	1	4	3	43	56	56	1	1	0	1	3	12
Tennessee	1	2	2	47	68	91	0	0	1	2	10	5
Alabama	2	0	0	15	33	42	0	0	0	1	1	3
Mississippi [3]	0	3	2	14	43	15	0	0	0	2	5	3
WEST SOUTH CENTRAL												
Arkansas	0	0	1	12	22	21	0	1	1	4	4	4
Louisiana	3	0	0	10	10	10	0	0	0	8	8	8
Oklahoma	5	0	1	73	20	23	0	0	1	6	0	3
Texas	12	14	3	55	62	62	3	0	0	14	5	9
MOUNTAIN												
Montana	0	0	0	19	8	26	0	0	0	1	1	1
Idaho	0	1	1	30	8	7	0	1	0	1	1	1
Wyoming	3	0	0	5	5	5	0	0	0	0	0	0
Colorado	0	2	0	37	36	29	0	1	1	1	2	2
New Mexico	4	0	0	8	10	10	0	1	0	2	4	3
Arizona	0	0	0	26	5	6	0	0	0	1	1	1
Utah [3]	6	0	1	36	19	15	0	0	0	3	0	1
Nevada	0	0	0	2	0	0	0	0	0	1	0	0
PACIFIC												
Washington	30	3	1	91	24	30	0	0	0	1	1	1
Oregon	17	4	3	53	16	16	0	0	0	0	0	3
California	54	23	2	242	146	146	0	0	1	2	2	6
Total	221	100	163	3,053	2,634	2,651	13	9	44	95	94	176
46 weeks	11,843	3,833	6,793	121,996	110,559	138,396	676	707	2,176	5,085	6,303	8,911

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended November 20, 1943, and comparison with corresponding week of 1942 and 5-year median—Continued

Division and State	Whooping cough			Week ended Nov. 20, 1943								
	Week ended		Median 1938–42	Anthrax	Dysentery			Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
	Nov. 20, 1943	Nov. 21, 1942			Amebic	Bacillary	Unspecified					
NEW ENGLAND												
Maine	17	65	36	0	0	0	0	0	0	0	0	0
New Hampshire	0	1	1	0	0	0	0	0	0	0	0	0
Vermont	7	40	9	0	0	0	0	0	0	0	0	0
Massachusetts	113	285	158	0	0	0	9	3	0	0	0	0
Rhode Island	29	4	12	0	0	0	0	0	0	0	0	0
Connecticut	31	107	72	0	0	2	0	1	0	0	0	0
MIDDLE ATLANTIC												
New York	294	581	466	0	2	43	0	0	1	0	0	0
New Jersey	135	186	188	0	0	0	7	0	0	0	0	0
Pennsylvania	164	305	315	1	0	4	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	142	180	180	0	0	0	0	1	0	0	0	0
Indiana	55	28	28	0	0	0	0	2	0	0	0	0
Illinois	150	198	200	0	1	1	0	1	0	0	0	0
Michigan [2]	157	263	295	0	0	1	0	0	0	0	0	0
Wisconsin	153	199	199	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	38	54	52	0	2	0	0	0	0	0	0	0
Iowa	61	17	17	0	0	0	0	0	0	0	0	0
Missouri	26	5	22	0	0	0	0	0	0	0	0	0
North Dakota	5	10	13	0	0	0	0	0	0	0	0	0
South Dakota	10	5	5	0	0	0	0	0	0	0	0	0
Nebraska	15	7	7	0	0	0	0	0	0	0	0	0
Kansas	31	67	49	0	0	1	0	1	0	0	0	1
SOUTH ATLANTIC												
Delaware	1	3	9	0	0	0	0	0	0	0	0	0
Maryland [2]	74	116	48	0	0	0	1	2	0	0	0	0
District of Columbia	7	19	11	0	0	0	0	0	0	0	0	0
Virginia	59	36	44	0	0	0	43	0	0	1	2	2
West Virginia	22	25	25	0	0	0	0	0	0	0	0	0
North Carolina	193	60	107	0	0	0	0	0	0	0	0	6
South Carolina	53	31	32	0	0	1	0	0	0	0	1	2
Georgia	10	16	15	0	0	2	0	0	0	0	0	35
Florida	7	11	11	0	1	0	0	0	0	0	0	7
EAST SOUTH CENTRAL												
Kentucky	88	78	58	0	0	0	1	0	0	1	2	0
Tennessee	23	43	43	0	0	0	2	0	0	0	0	2
Alabama	26	13	13	0	0	0	0	0	0	0	0	25
Mississippi [2]	----	----	----	0	0	0	0	0	0	0	0	2
WEST SOUTH CENTRAL												
Arkansas	49	7	11	0	3	1	0	0	0	0	0	0
Louisiana	2	0	4	0	3	1	0	0	0	0	0	8
Oklahoma	0	15	10	0	0	0	0	0	0	0	0	0
Texas	93	162	77	0	24	574	0	0	0	0	0	20
MOUNTAIN												
Montana	9	16	16	0	0	0	0	0	0	0	0	0
Idaho	4	5	5	0	0	0	0	0	0	0	0	0
Wyoming	3	4	1	0	0	0	0	0	0	0	1	0
Colorado	53	23	38	0	0	0	0	0	0	0	0	0
New Mexico	2	27	20	0	0	4	1	0	0	0	0	0
Arizona	36	1	3	0	0	0	17	0	0	0	0	0
Utah [3]	21	18	25	0	0	0	0	0	0	0	0	0
Nevada	13	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	73	11	57	0	2	0	0	0	0	0	0	0
Oregon	17	18	18	0	0	0	0	0	0	0	0	0
California	104	235	164	0	3	13	0	2	1	0	0	1
Total	2,675	3,600	3,600	1	41	648	81	13	2	2	6	11
46 weeks	164,249	159,129	159,129	61	1,897	15,276	3,981	623	27	432	707	3,931
46 weeks, 1942	----	----	----	72	1,067	11,370	6,114	522	43	450	772	3,292

[1] New York City only. [2] Period ended earlier than Saturday.
[3] Including paratyphoid fever cases reported separately as follows: Massachusetts, 3; New York, 2; South Carolina, 1; Florida, 2; Arkansas, 1; Louisiana, 1.

WEEKLY REPORTS FROM CITIES

City reports for week ended November 6, 1943

This table lists the reports from 85 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.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	8	1	6	0	3	0	0	2
New Hampshire:												
Concord	0	0	------	0	0	0	1	0	0	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	4	0	------	0	2	5	12	0	32	0	0	16
Fall River	0	0	------	0	0	0	3	2	3	0	0	8
Springfield	0	0	------	0	1	0	1	0	5	0	0	9
Worcester	0	0	------	0	1	0	5	0	20	0	0	1
Rhode Island:												
Providence	0	0	------	0	20	0	3	2	5	0	0	31
Connecticut:												
Bridgeport	0	0	------	0	0	0	5	0	5	0	2	2
Hartford	0	0	------	0	0	0	0	0	3	0	0	7
New Haven	0	0	------	0	0	2	2	0	1	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	1	0	0	7	2	4	0	0	11
New York	8	0	4	3	84	24	54	4	107	0	2	56
Rochester	0	0	------	0	1	1	4	0	4	0	0	6
Syracuse	0	0	------	0	0	0	1	1	2	0	0	9
New Jersey:												
Camden	2	0	------	0	0	2	3	0	2	0	0	1
Newark	0	0	------	0	4	2	4	0	5	0	0	14
Pennsylvania:												
Philadelphia	1	0	3	2	5	5	23	0	37	0	0	31
Pittsburgh	5	2	1	1	75	2	19	1	14	0	0	5
Reading	0	0	------	0	1	0	0	0	1	0	0	4
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	2	0	------	0	5	2	2	0	17	0	0	6
Cleveland	0	0	3	1	1	3	5	0	32	0	0	32
Columbus	1	0	1	1	7	0	0	0	13	0	0	10
Indiana:												
Fort Wayne	0	0	------	0	0	0	1	0	1	0	0	1 0
Indianapolis	5	0	------	2	1	0	4	0	11	0	0	5
South Bend	0	0	------	0	16	0	0	0	0	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	2	0	0	0
Illinois:												
Chicago	3	0	1	2	2	11	17	9	28	0	0	42
Michigan:												
Detroit	1	0	1	0	7	12	16	1	36	0	2	33
Flint	0	0	------	0	3	0	0	0	4	0	0	10
Grand Rapids	0	0	------	0	5	0	2	0	5	0	0	4
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	3	0	0	0
Milwaukee	0	0	------	0	1	0	1	0	45	0	0	51
Racine	0	0	------	0	0	0	0	0	8	0	0	12
Superior	0	0	------	0	232	0	0	0	0	0	0	15
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	8	0	2	0	5	0	0	10
Minneapolis	7	0	------	1	13	1	4	1	20	0	0	3
St. Paul	1	0	------	0	32	0	4	0	16	0	0	20
Missouri:												
Kansas City	1	0	------	0	3	0	4	0	19	0	0	2
St. Joseph	0	0	------	0	0	0	0	0	0	0	0	0
St. Louis	0	0	------	1	2	0	6	1	4	0	0	3

City reports for week ended November 6, 1943—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	1	0	------	0	0	0	2	1	8	0	0	0
Kansas:												
Topeka	0	0	------	0	3	1	0	0	1	0	0	18
Wichita	0	0	------	0	1	0	1	1	1	0	0	1
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	7	0	4	0	1	0	0	0
Maryland:												
Baltimore	3	0	1	1	7	6	13	0	17	0	0	25
Cumberland	0	0	------	0	0	0	0	0	0	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	2
District of Columbia:												
Washington	0	0	------	0	5	2	6	0	9	0	0	6
Virginia:												
Lynchburg	0	0	------	0	150	0	2	0	1	0	0	23
Richmond	0	0	1	0	16	0	2	0	2	0	0	1
Roanoke	0	0	------	0	1	0	0	0	0	0	0	6
West Virginia:												
Charleston	0	0	------	0	2	0	0	0	7	0	0	0
Wheeling	0	0	------	0	0	0	3	0	0	0	0	0
North Carolina:												
Winston-Salem	3	0	------	0	2	0	2	0	2	0	0	0
South Carolina:												
Charleston	0	0	8	0	0	2	0	0	2	0	0	0
Georgia:												
Atlanta	3	0	12	0	0	0	0	0	2	0	1	0
Brunswick	0	0	0	0	0	0	0	0	0	0	0	0
Savannah	0	0	------	0	0	1	0	0	1	0	0	0
Florida:												
Tampa	0	0	------	0	1	0	1	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	1	0	0	0	2	0	7	0	0	8
Nashville	0	0	------	0	0	1	2	0	2	0	0	2
Alabama:												
Birmingham	0	0	2	0	4	0	4	0	5	0	0	0
Mobile	2	0	------	2	0	0	6	0	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	2	0	0	0	0	0
Louisiana:												
New Orleans	1	0	2	2	1	1	5	2	4	0	1	1
Shreveport	0	0	------	0	0	0	5	0	1	0	1	0
Texas:												
Dallas	4	0	------	0	0	1	2	0	4	0	0	0
Galveston	0	0	------	0	0	0	1	0	2	0	0	0
Houston	1	0	------	0	0	1	3	0	3	0	3	0
San Antonio	2	0	1	0	0	0	7	4	1	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	1	0	0	0	0	0
Great Falls	0	0	------	0	18	0	1	0	1	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	0	0	1	0	1	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	2
Colorado:												
Denver	2	0	11	0	2	1	5	1	7	0	0	15
Pueblo	0	0	------	0	19	0	2	1	2	0	0	0
Utah:												
Salt Lake City	0	0	------	0	2	0	1	2	3	0	0	3

City reports for week ended November 6, 1943—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	3	0	------	1	4	0	3	5	3	0	0	14
Spokane	0	0	------	0	4	0	5	0	18	0	1	3
Tacoma	0	0	------	0	3	1	0	0	5	0	0	0
California:												
Los Angeles	12	0	5	2	8	3	4	10	8	0	0	8
Sacramento	2	0	2	2	0	0	0	0	0	0	0	1
San Francisco	1	0	1	0	0	0	6	4	9	0	0	11
Total	82	2	61	25	800	94	325	55	663	0	13	622
Corresponding week, 1942	79	2	90	25	471	28	329	24	718	1	12	959
Average, 1938–42	115	------	86	[1] 20	[2] 476	------	[1] 312	------	642	2	28	1086

Anthrax.—Cases: Camden, 1; Philadelphia, 1.
Dysentery, amebic.—Cases: Boston, 2; Rochester, 1; Atlanta, 1.
Dysentery, bacillary.—Cases: New Haven, 1; Buffalo, 1; New York, 14; Syracuse, 1; Chicago, 2; Baltimore, 7; Charleston, S. C., 14; Los Angeles, 8.
Dysentery, unspecified.—Cases: Baltimore, 2; Richmond, 1; San Antonio, 9.
Typhus fever.—Cases: Savannah, 1; Nashville, 2; Birmingham, 5; New Orleans, 8; Dallas, 2; Houston, 1.

[1] 3-year average, 1940–42.
[2] 5-year median.

Rates (annual basis) per 100,000 population, by geographic groups, for the 85 cities in the preceding table (estimated population, 1942, 34,447,100)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	9.9	0.0	0.0	0.0	79.5	19.9	94.4	9.9	191.3	0.0	5.0	191
Middle Atlantic	7.2	0.9	3.6	3.2	76.7	16.2	51.9	3.6	79.4	0.0	0.9	62
East North Central	7.1	0.0	3.5	3.5	164.9	16.5	28.3	5.9	120.7	0.0	1.2	130
West North Central	19.8	0.0	0.0	4.0	122.6	4.0	45.5	7.9	146.4	0.0	0.0	113
South Atlantic	15.6	0.0	38.2	1.7	331.4	19.1	57.3	0.0	76.4	0.0	1.7	109
East South Central	17.8	0.0	17.8	11.9	23.8	5.9	83.2	0.0	89.1	0.0	0.0	59
West South Central	23.5	0.0	8.8	5.9	2.9	8.8	73.3	17.6	44.0	0.0	14.7	3
Mountain	16.1	0.0	88.4	0.0	329.6	8.0	88.4	32.2	112.6	0.0	0.0	161
Pacific	31.5	0.0	14.0	8.7	33.2	7.0	31.5	33.2	75.2	0.0	1.7	65
Total	12.4	0.3	9.2	3.8	121.1	14.2	49.2	8.3	100.4	0.0	2.0	94

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—A rat found on October 25, 1943, in Makawao area, Island of Maui, T. H., has been proved positive for plague.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 23, 1943.—During the week ended October 23, 1943, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		1		151	147	39	45	16	65	464
Diphtheria		18	4	15		6	1			44
Dysentery (bacillary)				4		1				5
Encephalitis, infectious							2			2
German measles				5	11		1	4	29	50
Influenza			6		4				11	21
Measles		3		178	101	23	3	6	28	342
Meningitis, meningococcus		1	1	2	5	1			1	11
Mumps		21		25	94	17	4	15	34	210
Poliomyelitis		2		10	5	1				18
Scarlet fever		5	14		74	33	18	22	36	202
Tuberculosis (all forms)		3	4	67	48	19		13	52	206
Typhoid and paratyphoid fever				11				1	1	13
Undulant fever					2	1				3
Whooping cough		7		97	89	21	69	28	18	329

GREAT BRITAIN

England and Wales—Infectious diseases—13 weeks ended April 3, 1943, and July 3, 1943.—During the 13 weeks ended April 3, 1943, and July 3, 1943, cases of certain infectious diseases were reported in England and Wales as follows:

Disease	13 weeks ended—		Disease	13 weeks ended—	
	April 3, 1943	July 3, 1943		April 3, 1943	July 3, 1943
Cerebrospinal fever	1,268	906	Puerperal pyrexia	2,191	2,087
Diphtheria	10,434	8,104	Scarlet fever	26,712	23,759
Dysentery	1,328	1,655	Typhoid and paratyphoid fever	170	195
Measles	221,454	127,669	Whooping cough	28,043	27,343
Ophthalmia neonatorum	1,155	1,183			
Pneumonia	18,258	10,263			

England and Wales—Vital statistics—Quarters ended March 31, 1943, and June 30, 1943.—The following table shows the numbers of

births and deaths with rates per 1,000 population in England and Wales for the first and second quarters of 1943, and are provisional:

	Quarter ended—			
	March 31, 1943		June 30, 1943	
	Number	Rate per 1,000 population	Number	Rate per 1,000 population
Live births	171,819	16.8	180,691	17.5
Stillbirths	5,782	.57	5,556	.54
Deaths, all causes	137,568	13.5	113,234	11.0
Deaths under 1 year of age	9,914	[1] 60	8,028	[1] 46

[1] Per 1,000 live births.

MARTINIQUE

Fort de France—Influenza.—Information dated November 8, 1943, states that an epidemic of influenza which causes facial paralysis is current in Fort de France, Martinique.

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-August 1943	September 1943	October 1943—week ended—				
				2	9	16	23	30
ASIA								
Ceylon	C	50						
China: Kwangsi Province	C	[1] 1,100						
India	C	185,268	24,898	6,062	8,112			
Bombay	C	14	2	1	11			
Calcutta	C	3,910	1,118	289	293	287		
Chittagong	C	233	12	2	13			
Cochin	C	189	3					
Madras	C	988	15		1	26	12	
Negapatam	C	21						
Vizagapatam	C	61	2					
India (French)	C	55						
Chandernagor	C	8						
Karikal	C	30						
Pondichery	C	17						

[1] Cases reported up to September 8, 1943, with a mortality rate of over 25 percent.

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		January–August 1943	September 1943	October 1943—week ended— 2	9	16	23	30
AFRICA								
Basutoland	C	[1] 23						
Belgian Congo	D						[2] 7	
Plague-infected rats		P						
British East Africa:								
Kenya	C	14	1					
Uganda	C	18						
Egypt	C	6	8					
Port Said	C	6						
Madagascar	C	40						
Morocco (French)	C	238	3				1	
Senegal	C	240						
Dakar	C	31	1					
Union of South Africa	C	60	5					
ASIA								
India	C	2,336	1,078	209	272			
Indochina	C	23	6		1			
Palestine	C	12						
SOUTH AMERICA								
Peru:								
Lambayeque Department	C	2						
Libertad Department	C	15	1					
Lima Department	C	9	2					
Lima	C	1						
Plague-infected rats		P						
Piura Department	C	2						
Venezuela	C	10						
OCEANIA								
Hawaii Territory:								
Hamakua District	D	5						
Plague-infected rats		[3] 73					1	

[1] Includes 12 pneumonic cases in a village south of Mafeteng.
[2] Suspected pneumonic plague.
[3] Includes 4 plague-infected mice.

SMALLPOX

[C indicates cases; D, deaths]

AFRICA								
Algeria	C	950	137					
Angola	C	594						
Basutoland	C	81						
Belgian Congo	C	2,407	568	172	147	116		
British East Africa:								
Kenya	C	1,044	444	73	77	164		
Mombasa	C	3						
Tanganyika	C	24	3	3				
Uganda	C				15	5		
Dahomey	C	141						
Egypt	C	2,269	579					
French Guinea	C	326	10		1			
Gold Coast	C	16						
Ivory Coast	C	144			10			
Mauritania	C	14	13		13			
Morocco (French)	C	814	34					
Mozambique	C	1						
Nigeria	C	4,467	193	45	42	106		
Niger Territory	C	192	29		39			
Senegal	C	68	6					
Sierra Leone	C	3						
Sudan (French)	C	3,400	40		46			
Union of South Africa	C	345	1					
ASIA								
Arabia	C	1						
Ceylon	C	40	23	11	5			
India	C	31,555	2,873	456	742			
India (French)	C	10						
Indochina	C	4,117	202		73			
Iran	C	502						
Iraq	C	195						
Palestine	C	101		2		1		
Syria and Lebanon	C	942	45		5	7		
Trans-Jordan	C	18						

SMALLPOX—Continued

[C indicates cases; D, deaths]

Place		January–August 1943	September 1943	October 1943—week ended— 2	9	16	23	30
EUROPE								
Belgium	C	1						
France	C	2						
Germany	C	1						
Gibraltar	C	1						
Portugal	C	40				1		
Scotland	C	1						
Spain	C	204						
Switzerland	C	11						
Turkey	C	7,637	257					
NORTH AMERICA								
Canada	C	6						
Guatemala	C	26	1					
Mexico	C	283	22			1		
SOUTH AMERICA								
Brazil	C	43	1			3		
British Guiana	C	1						
Colombia	C	265	16					
Ecuador	C	13	3			1		
Peru	D	12						
Venezuela	C	78	13					[1]4

[1] For the month of October 1943.

TYPHUS FEVER

[C indicates cases; D, deaths]

AFRICA								
Algeria	C	8,040	72					
Basutoland	C		5					
Belgian Congo	C	20				19		
British East Africa:								
Kenya	C	1		1				
Mombasa	C	1						
Uganda	C	1						
Egypt	C	39,274	308					
Gold Coast	C	9						
Morocco (French)	C	13,489	63					
Morocco (Spanish)	C	369						
Nigeria	C	9		1				
Rhodesia, northern	C	8	2					
Senegal	C	2						
Dakar	C	15			1		3	
Sierra Leone	C	3						
Tunisia	C	206	26					
Union of South Africa	C	1,078	5	1				
ASIA								
Afghanistan	C	520						
China: Shanghai	C	12						
India	C	1,063	3					
Iran	C	9,153						
Iraq	C	1,421		1				
Palestine	C	240	26	1	15	1	13	
Syria and Lebanon	C	79	2					
Trans-Jordan	C	15						
EUROPE								
Bulgaria	C	1,698						
France—Seine Department	C	2						
Germany	C	[1]973						
Hungary	C	716	21	7	12	21		
Irish Free State	C	19						
Netherlands	C	1						
Portugal	C	8	1					
Rumania	C	6,853	107					[2]141
Slovakia	C	420	32	27	27	6		
Spain	C	557	1					
Turkey	C	3,879	48					

[1] For the period Jan. 1 to Apr. 30, 1943.
[2] For the month of October 1943.

TYPHUS FEVER—Continued

[C indicates cases; D, deaths]

Place		January–August 1943	September 1943	October 1943—week ended—				
				2	9	16	23	30
NORTH AMERICA								
Cuba	C		1					
Guatemala	C	823	144					
Jamaica	C	16	8			1	3	
Mexico	C	848	54	3	1			
SOUTH AMERICA								
Brazil	C	1						
Chile	C	183	21	2	3			
Colombia	D	1						
Ecuador	C	247	17					[2] 42
Peru	C	12						
Venezuela	C	12	1					
OCEANIA								
Australia	C	81	7	5		1		
Hawaii Territory	C	11						

[2] For the month of October 1943.

YELLOW FEVER

[C indicates cases; D, deaths]

AFRICA								
Belgian Congo:								
Bondo	D	2						
Kinzao	D	1						
Leopoldville	C	2						
Stanleyville	D	1						
Yanonge	C	1						
Dahomey:								
Djougou District	C		[1] 2					
Natitingou	C	[1] 1						
French Guinea:								
Baccoro	D							[1] 1
Conakry	D							[1] 1
Matak Island.[2]								
Gold Coast: Asuboi	C		1					
Senegal:								
Kolda	C		1					
Tambacounda	D							1
SOUTH AMERICA								
Brazil: Para State	D	1						
Colombia:								
Cundinamarca Department	D	3						
Intendencia of Meta	D	2						

[1] Suspected.
[2] On Nov. 4, 1943, 1 death from suspected yellow fever was reported at Matak Island near Conakry, French Guinea.

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