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A STUDY OF THE TREATMENT AND PREVENTION OF PELLAGRA.

Experiments Showing the Value of Fresh Meat and of Milk, the Therapeutic Failure of Gelatin, and the Preventive Failure of Butter and of Cod-Liver Oil.

By JOSEPH GOLDBERGER, Surgeon, and W. F. TANNER, Surgeon, United States Public Health Service.

It will be recalled that a preventive feeding experiment begun in 1914 by Goldberger, Waring, and Willets, and carried out among institutional inmates, resulted in demonstrating the complete preventability of pellagra by means of diet (1). The test was of such a character, however, that it did not in itself reveal what food or foods were to be credited with the favorable result. At most it suggested that the fresh meat and milk of the diet were concerned in bringing about the protective effect. This indication was strengthened by the results of a study of the relation of diet to pellagra incidence among households of certain South Carolina cotton mill villages (2). In this study it was found not only that pellagra occurred less frequently or not at all in households having a daily minimum average supply of approximately a pint of milk or of 30 grams of fresh meat per adult unit, but also that an increasing supply of each of these foods independently of the other was definitely associated with a decreasing pellagra incidence. These indications of the presence in both meat and milk of the essential pellagra preventive factor or factors gain additional support from a further study of these foods, the results of which study, with certain incidental observations, we desire to report at this time.

FRESH MEAT.

Our study of the value of fresh meat apart from milk or other animal protein food has been limited to its use as a therapeutic agent in the treatment of active cases of the disease at the Georgia State Sanitarium. We have, up to the present time, not attempted to test its value prophylactically.

Eight well-marked, though not very severe (mainly dermal), cases have so far been treated with fresh beef as the only known therapeutic element in the diet. The meat was lean round steak. Seven ounces (200 grams) of this meat, chopped fine, seasoned with salt,

and baked in its own juice, was offered daily as a supplement to the diet which the patient had been receiving when the attack developed (which diet already included a small amount of meat) or, in the case of newly admitted patients, as an addition to a diet approximating that which it is believed they had had before admission and of a type in association with which intramural cases had been observed to develop.

The following is a summary of the significant clinical features of these cases:

Case 1: A 16-year-old colored girl who was admitted to the sanitarium July 21, 1922. Pellagra was diagnosed August 14, 1922. There was no history of a previous attack. She came under our observation August 19, 1922, at which time she presented characteristic dermal lesions on the back of the hands, sides of the neck, and over the inner malleolus of the left foot. The bowels tended to slight overactivity. She was confused and delirious.

Treatment with the beef diet shown in Table I was begun on August 19, 1922. This she ate well from the first. Within two weeks improvement began to be perceptible, and thereafter continued progressively. By October 26, except for some residual marks of the dermatitis, she presented no recognizable evidence of pellagra. Between August 21 and December 31—the end of the period of treatment—her weight increased from 34.5 to 44 kilos.

Case 2: A white woman, 37 years old, who was admitted to the sanitarium May 6, 1922, with active pellagra, came under our observation on the same date. She presented a rather severe dermatitis of the hands and lower part of the forearms, and considerable keratosis of the forehead and bridge of the nose. The bowels were slightly loose. There was marked mutism. She was weak and in bed.

After three days on the mineral-and-vitamine-enriched ward diet shown in Table II, treatment was started with the beef diet shown in Table III. On May 12 the mineral and vitamine supplements were discontinued, making her diet as shown in Table IV. Her appetite, at first only fair, soon improved, and she ate more and more of the food offered her. By May 17 her condition showed a well-marked change for the better, but she continued as mute as when she came under our observation. By the end of the month, however, she was responding to simple questions and was up and about. In another two weeks her skin lesions had entirely cleared up, and by the end of June her mental condition showed marked improvement. During this period of eight weeks she gained approximately 5 kilos in weight. She left the institution on furlough September 8, 1922.

This patient, like case 1, showed very clear evidence of prompt and marked improvement on 200 grams of beef, although the diets (Table I and Table IV) otherwise were relatively low (as compared with the diet shown in Table II) in minerals and known vitamines.

The preceding were patients who had pellagra on admission to the sanitarium. Those next to be considered developed the recurrences for which they were treated while inmates of the institution,

and in spite of having subsisted for periods of not less than about two and one-half months on the mineral-and-vitamine-enriched diet shown in Table II.

Case 3: A white woman 40 years old who had pellagra in July, 1921. About March 15, 1922, a mild pellagrous erythema, marking the beginning of a recurrence, made its appearance. This was accompanied by a slight stomatitis and was soon followed by some looseness of the bowels.

On April 7 treatment with a gelatin diet (Table V) was begun, but this was taken so poorly that on April 13 a change was made to the beef diet shown in Table VI. One week later the allowance of meat was reduced to the standard 200 grams by discontinuing the portion allowed by the institution, leaving the diet as shown in Table III. The appetite of this patient continued poor to the end of the month, but she relished the meat, of which she ate practically all that was offered. During May her appetite improved. On May 12 the mineral mixture and the supplementary vitamine-rich foods were discontinued, leaving the diet as shown in Table IV. Her appetite continued to improve so that by the beginning of June she was eating practically all the food offered.

By about the middle of May all evidence of the dermatitis and gastrointestinal disturbance had cleared up. Her general appearance had very definitely improved. Her weight, which had been tending downward, began to go up after the beef treatment was instituted; between April 11 and July 4 it increased from 35.2 to 42.2 kilos.

Thus the change in diet on April 13, consisting of an increase in the fresh meat, was followed by improvement in her general appearance, by clearing up of the skin lesions, of the stomatitis, and of the bowel disturbance, and by a gain in appetite and weight. It is worthy of note that this improvement continued in spite of the reduction in minerals and vitamines resulting from the change on May 12 from the diet shown in Table III to that shown in Table IV.

Case 4: A white woman 34 years old who had pellagra in 1913 and recurrences in 1914, 1920, 1921, and 1922. The recurrence in 1922 began about March 29 with the appearance of an erythema on the hands and neck and some looseness of the bowels.

Treatment was begun on April 7, and, as in case 3, with the gelatin diet shown in Table V. Unlike case 3, this patient's appetite was good; she ate this diet well. The skin lesions passed through the normal cycle of changes so that they had quite cleared up by about April 19. The bowels, however, continued loose, and about May 10 a slight stomatitis was observed to have appeared.

On May 13 the daily offering of gelatin was increased, the allowance of cod-liver oil reduced, and that of tomatoes slightly increased, so that the diet became as shown in Table VII. She continued to eat well; nevertheless, about 10 days later—that is, about May 24—a fresh dermatitis appeared on the hands and forearms. Her bowels continuing loose, it was thought that it might be advantageous to replace the cod-liver oil with butter. This was done on May 27, the diet thereafter having the composition shown in Table VIII. Her appetite and food consumption continued excellent in spite of a slight stomatitis.

On June 9 a pellagrous dermal patch appeared on the neck; on June 29 an erythema was found to have developed about the knees; and on July 5 the skin on the back of the feet was found to be affected.

Since the relapsing dermal lesions seemed to indicate a failure of gelatin to favorably influence the progress of the disease, a change was made on July 7 to the beef diet shown in Table IX. Within a month after this change the patient's condition had definitely improved. By the end of the first week of August she no longer presented evidence of the attack except, possibly, that her bowel actions were soft. She continued to improve in general appearance and strength during a further period of observation ending January 2, 1923, although her bowels continued to act irregularly. A fecal examination on October 12 revealed *Ascaris* ova, whipworm ova, and *Strongyloides* embryos which, in part, at least, probably explained the loose and irregular bowels. Up to about the middle of October this patient's weight was maintained at a level of between 41 and 42 kilos. After this it went up, so that by January 2, 1923 (the end of the period of treatment), she had gained 4.5 kilos.

In summary it appears that during the six months (July 7, 1922, to January 2, 1923) following the inauguration of the treatment with 200 grams of beef (Table IX), this patient's condition underwent definite improvement in marked contrast with the unsatisfactory progress on the gelatin (and mineral-and-vitamine-enriched) diet (Tables V, VII, and VIII) during the immediately preceding period of three months.

Case 5: A white woman 46 years old who had pellagra in 1913 and recurrence in 1914, 1918, 1921, and 1922.

The recurrence in 1922 began to develop about March 29 with the appearance of an erythema on the hands and forearms.

Treatment with a gelatin diet (Table V) was begun April 7, but this was taken so poorly that on April 13 a change was made to the beef supplemented ward diet (Table VI).

A week later the beef was reduced to 200 grams by omitting the institution portion (Table III), and on May 12 the mineral mixture and supplement of certain vitamine-rich foods were discontinued, so that thereafter the diet was as shown in Table IV.

She took the meat quite well, but her appetite for the remaining portion of her diet continued poor through April and May. During June her food intake became much improved. Up to April 13 her weight had tended downward; after this, this trend was arrested and, if anything, turned in an upward direction. Between April 13 and July 4 her weight showed but slight change—a rise from 45.8 to 47.2 kilos.

Within a month after beginning the beef, the dermatitis had cleared up, and during the remainder of the period of treatment, ending July 6, 1922, the patient remained free from recognizable evidence of pellagra.

Case 6: A white woman 52 years old who had pellagra in 1914 and recurrence in 1918, 1921, and 1922.

The recurrence of 1922 began between March 29 and April 5 with the appearance of a dermatitis on the hands. Treatment was begun April 7 with a gelatin diet (Table V). She took this well. On May 13 the gelatin was increased to a daily offering of 85 grams, the allowance of cod-liver oil was reduced, and that of canned tomatoes

somewhat increased, the resulting diet being that shown in Table VII. She continued to eat well, actually consuming a daily average of approximately 80 grams of gelatin during the period May 13–31, and 79 grams during the period June 1–26.

The dermatitis which began between March 29 and April 5 and which, at its height, involved the hands, forearms, and feet, passed through the ordinary cycle of pigmentation, keratosis, and desquamation, reaching by June 14 the stage where there remained but a residual keratotic fringe on the foot. Two weeks later, however, there appeared a fresh erythema on the back of each forearm, and by July 5 the knuckles and back of the hands were also involved. There was present no other recognizable disturbance. Throughout the period January 3 to July 5 the weight oscillated between 53.5 and 56.5 kilos.

The gelatin diet having, as in case 4, proved inadequate to prevent a relapse of the dermatitis, a change to the beef treatment (Table IX) was made on July 7. She continued to eat well, and by the middle of September was free of active pellagra, and so remained to December 26, the end of the period of treatment. Between August 1 and December 26 her weight rose from 53.5 kilos to 61.5 kilos.

Case 7: A white woman 39 years old who had pellagra in 1917 and recurrence in 1918, 1921, and 1922.

The recurrence in 1922 began about April 5 with the appearance of an erythema on the right forearm. By May 10 the pellagrous dermatitis had affected the hands, forearms, and forehead, and a mild stomatitis was present.

On May 13 treatment was begun with gelatin (Table VII). Her appetite being excellent, she consumed practically all of the food offered, it being estimated that during the period May 13 to June 30 her consumption of gelatin approximated an average of 83 grams daily. Notwithstanding this, however, a fresh erythema developed during June, slight mental confusion became perceptible, and toward the close of this month the bowels developed a slightly increased activity. Accordingly, on July 7 the treatment was changed to beef (Table IX). Following this change, improvement set in, and all recognizable evidence of the attack disappeared by about the close of August. Up to about the middle of September her weight tended slightly downward, but after this time, to the end of the year, she maintained her weight with but negligible oscillations.

There was in this case, therefore, a clearing up of the evidence of a recurrent attack of pellagra following upon the inauguration of the beef treatment, although during the immediately preceding period of about eight weeks, on a liberal gelatin diet, the attack had shown a tendency to increased severity. It is worthy of note, also, that the improvement asssociated with the beef diet took place, as in case 4, in spite of the reduction in the minerals and known vitamines coincident with the change from the gelatin (Table VII) to the beef diet (Table IX).

Case 8: A white woman 31 years old who had pellagra in 1914 and recurrence in 1918, 1920, and 1922.

The 1922 recurrence began some time between about May 3 and May 10 with the appearance of a pellagrous dermatitis on the feet.

Treatment was inaugurated on May 13 with the gelatin diet shown in Table VII. This she ate well. The dermatitis cleared up during

the month, but the bowels, which had been somewhat irregular even before the appearance of the dermatitis, continued loose. Fecal examination made in May showed *Trichuris* ova, and, in June, some *Ascaris*. She maintained her weight with, perhaps, a slight gain during this period. Her condition having seemingly improved on the gelatin diet, it was thought that the indication in favor of gelatin would be strengthened if the small allowance of beef in the basic diet were excluded. This was accordingly done on July 7, at the same time compensating for the calories by an increase in the allowance of butter (Table X).

During the period July 7 to July 31 her food consumption continued well nigh complete, so that it is estimated that she ingested an average of approximately 83 grams of gelatin daily. Notwithstanding this, however, a relapse of the dermatitis on her feet developed between July 15 and July 19, which, after subsiding somewhat, flared up anew on August 2 and again on August 9. During this latter period there was also some falling off in appetite.

This failure to maintain the seemingly favorable progress noted early in July led to a change, on August 18, to the beef diet shown in Table IX. The change was followed by a return of appetite, a slight change for the better in bowel activity, gain in weight, and clearing up of skin lesions. Between August 22 and December 5 her weight increased from 38.5 to 44.5 kilos. On January 7, 1923, the close of the period of treatment, this patient presented no recognizable evidence of her recurrence, unless a persistent though reduced irregularity of the bowels is to be so regarded.

Thus, as in cases 4, 6, and 7, a liberal daily intake of gelatin failed to prevent a relapse of the dermal manifestations of the disease, but definite clinical improvement was noted following the change to the treatment with beef. It is worthy of note, too, that this improvement took place in spite of the reduction in minerals and known vitamines associated with the change from the gelatin (Table X) to the beef diet (Table IX).

It is seen, then, that in all eight cases well-marked and progressive clinical improvement followed the inauguration of the treatment with fresh beef. This is particularly significant in the four cases (Nos. 4, 6, 7, and 8) in each of which the treatment with beef had been preceded by a considerable period of treatment with gelatin which, though coupled with a mineral and vitamine enriched basic diet, had failed to arrest the progress of the attack. This contrast tends to emphasize, on the one hand, the inadequacy of gelatin, and, on the other, the therapeutic potency of fresh beef.

Taken by itself, so restricted a therapeutic test can hardly be more than suggestive; but when coupled with the available evidence of the preventive value of fresh meat, it strengthens the indications that fresh beef contains the pellagra preventive factor or factors.

MILK.

Although the available evidence already strongly supported the inference that milk, when a generous element in the diet, operated

to prevent pellagra, nevertheless it seemed highly desirable to put this inference to direct test. This was done at the Georgia State Sanitarium during 1922.

In the rural areas of the South, milk is most commonly consumed as buttermilk. We therefore chose buttermilk as the form of milk to use in this study. It was fresh, locally produced, and of fair quality. Analysis of a sample in the division of chemistry of the Hygienic Laboratory showed it to contain 2.88 per cent of protein (Nx 6.38). A daily allowance of approximately 1,200 grams (40 fluid ounces) of this milk was offered each one of a group of 29 colored female inmates of the sanitarium. It was well taken as a beverage at each one of the meals. The approximate composition of the diet so supplemented is shown in Table XI.

Of the 29 patients constituting the group, 19 were pellagrins and 10 nonpellagrins. Of the pellagrins, 16 remained in the test for one year, to its termination on January 2, 1923. Three dropped out and passed from observation after shorter periods (6½, 8, and 10 months, respectively) by reason of the development of intercurrent illness necessitating transfer to other wards. Of the 10 nonpellagrins, 9 remained throughout, 1 passing from observation on July 22, after a period of over 6½ months, on account of pulmonary tuberculosis.

None of the group of 29 patients developed any evidence of pellagra at any time during the observation period which, for 16 of the pellagrins and 9 of the nonpellagrins, lasted one year.

Since our rather extensive experience with this class of patients has convinced us that without the buttermilk (or equivalent supplement) upward of 40 or 50 per cent of the group would with certainty have developed pellagra within a period of from three to seven or eight months, the complete absence of any indication of the disease in any of this group is, in our judgment, conclusive evidence of the preventive action of the buttermilk.

We have here, then, and for the first time, a direct demonstration of what heretofore has been an inference from indirect evidence—namely, that milk contains the essential pellagra preventive factor or factors.

DISCUSSION.

The results herein reported are of interest in several respects. In the first place they emphasize anew the importance of fresh meat and milk in the treatment and prevention of pellagra. This does not mean, as Hindhede (4) has taken it to mean (in the face of repeated warnings to the contrary (5)) that these are the only foods possessing pellagra-preventive value. On the contrary, not only is it possible, but we think it probable, that other foods will prove equally or even more potent. Unfortunately their identity remains to be determined.

Judging by our observation of a very high incidence of the disease associated with such diet as that which was supplemented by the beef in Tables I, III, IV, VI, and IX, and by the buttermilk in Table XI, it would seem as if this basic diet included but insignificant, if any, preventive elements. Our results with the beef and milk supplements are also of interest, therefore, in that they afford some idea of the effective quantity of these foods.

The determination of the quantity of beef to be used in our study was largely arbitrary. We were guided in a measure by the observation that at the sanitarium the allowance of meat which, so far as we are able to judge, has in the past been the principal if not the sole preventive element in the general diet, has not been adequate to prevent all recurrences of the disease. We reasoned that, since the vast majority of the inmates seemed to be protected, that is, showed no evidence of the disease, this quantity of meat is presumably only a little short of being fully adequate. It seemed reasonable to assume, therefore, that twice this allowance—that is to say, an allowance of an equivalent of about 100 grams of round steak—would suffice to prevent all but very exceptional cases. But since for the treatment of active cases, particularly recurrences in patients of the dilapidated physical and mental type with which we were dealing, a quantity in excess of that sufficient for prevention would probably be desirable if not necessary, we doubled the quantity we judged might be adequate for prevention, thus arriving at 200 grams as the quantity to be tried in treatment.

While it is possible that for purposes of treatment even larger quantities may in exceptional instances be necessary, it seems highly probable, if not certain, that for preventive purposes a smaller quantity will be ample. Indeed, the experience at the sanitarium, already referred to, suggests that the small quantity allowed as part of the general diet of that institution is well-nigh sufficient, and, as has been mentioned, we think it probable that not more than about twice this allowance—that is, about 100 to 125 grams—would be found entirely adequate in all but very exceptional instances.

In deciding upon the allowance of buttermilk to use in our test of this food, we were guided by our experience with it in the treatment of active cases. We had found that 32 to 40 fluid ounces as a supplement to the basic diet did not always seem adequate to arrest the progress of symptoms which cleared up following an increase to 48 ounces. It is not certain that even this larger quantity will invariably suffice to arrest an attack, for in a recent instance, unique in our experience, there was a relapse of symptoms following a period of apparent improvement in spite of a faithful trial of a milk diet containing 32 ounces of fresh whole milk and 24 ounces of buttermilk. Since it seemed that, for preventive purposes, a quantity

smaller than the maximum needed for treatment would be adequate, we decided to try 40 ounces. As has been seen, this proved to be adequate in the group studied by us, and it is not improbable that a somewhat smaller quantity might have served equally well. Considering the restricted basic diet and the type of individual [1] with which we were dealing, it seems probable that no more than this quantity will suffice in all but very exceptional instances.

In this connection the question arises, How does fresh whole milk compare with buttermilk in potency? We have made no direct comparison. But it is of interest to note that our experience with butter as the therapeutic and preventive element in the diet has been very disappointing. Although we have tried it repeatedly and in increasing quantities, the consumption in several recent instances having equaled a daily average of approximately 135 to 145 grams of fresh, locally produced butter (estimated as representing 100 to 110 grams of butterfat) from cows largely pasture fed, for periods of from three to upwards of five months (the patients weighing between 51 and 57.5 kilos), it has practically invariably failed to prevent recurrence of the disease. And in passing it may be remarked that the results of similar trials with cod-liver oil have been equally disappointing. Consumed in quantities of 128 grams (that is, in proportion of over 2 grams per kilo of body weight) daily for periods as long as three, four, and five months, no preventive effect on the recurrence of the disease was appreciable. Since it would thus appear that the pellagra-preventive factor is not present (in appreciable amount) in butter, it is perhaps permissible to infer that whole milk is not materially, if at all, more potent than buttermilk. So far, then, as the treatment and prevention of pellagra (in the specific sense) is concerned, fresh milk and buttermilk may be assumed to be quantitatively interchangeable.

Our experince with meat and with milk has naturally suggested a comparison of their value. Unfortunately our data are not of such a character as to permit us to form anything more than an impression with regard to this question.

Our experience with these foods has not afforded us entirely comparable quantitative data of their value in treatment, and, as already stated, we have not made a direct study of the preventive value of meat by itself. Nevertheless, this experience and the rough estimates which have already been discussed may be taken as affording at least a suggestion of the comparative value of meat and buttermilk. Thus we have found 200 grams of lean round steak (42 grams protein) to be very efficient in arresting the progress and clearing up the symptoms

[1] It may be well to keep in mind that our observations were on insane pellagrins, many of whom had had repeated attacks of pellagra, in consequence of which their nutritional needs (quantitative) were probably relatively higher than the normal.

of an attack. We have had similar though, we have thought, not quite so prompt effects from 48 ounces of buttermilk (43 grams protein). And we have estimated that approximately 125 grams of lean round steak (27 grams protein) would probably be as efficient in prevention as the 40 ounces of buttermilk (36 grams protein) were found to be. These considerations lead to the suggestion that gram for gram, on the basis of protein content, fresh beef is somewhat more efficient than buttermilk.

Notwithstanding the possibly greater potency of fresh beef, milk, for purposes of treatment at least, must be regarded as the more valuable, since, among other reasons, it has the practical advantage that it needs no mastication, and can therefore be readily taken by patients in whom the condition of the mouth may render mastication painful or impossible and can be easily given by tube in cases refusing nourishment.

Our study is of interest, finally, as it bears on the problem of the identity of the essential preventive dietary factor or factors. Here it may be worth recalling that six of the cases treated with fresh beef had developed their attacks under our observation in spite of having subsisted for periods of not less than about two and one-half months on the mineral-and-vitamine-enriched sanitarium diet shown in Table II. These cases formed the principal subject of a previous report (3). As was there stated, it would seem as if this diet must have yielded an abundance of the known vitamines and minerals, thus excluding deficiency of these and leaving the protein (amino acid) mixture of the diet, some as yet unrecognized dietary complex (possibly a vitamine), or some combination of these, for consideration in relation to the development of the disease.

This interpretation is supported and strengthened so far as concerns the antiophthalmic and the antirachitic complexes by the failure of butter and of cod-liver oil as preventives, and as concerns the antineuritic and the antiscorbutic complexes by the therapeutic efficiency, particularly under the conditions of our study, of a food (muscle tissue of beef) known to be relatively quite poor in these factors (9). With respect to protein it may be observed that the failure of gelatin in the treatment of the cases in which beef was subsequently tried with markedly beneficial effect, would seem to indicate that the latter result can not be attributed to protein per se. This is in harmony with the indication afforded by the study of the diet of pellagrous and nonpellagrous households (2) of South Carolina cotton-mill villages—namely, that the quantity of protein supplied is in itself not an essential factor in relation to the incidence of pellagra.

In passing, it may be remarked that this affords no support for the view a few years ago advocated by Deeks (6) and recently in a some-

what modified form adopted by Jobling and Arnold (7), that the production of pellagra is dependent on the excessive consumption of carbohydrate. While neither Deeks nor Jobling and Arnold tell us just what they mean by an "excess" of carbohydrates, we nevertheless find it difficult to believe that the diet shown in Table II or that shown in Table XII, both of which we have seen associated with the development of pellagra, furnished an "excess" of carbohydrates. But if this be an "excess," and if the relatively high incidence of pellagra in our Southern States is to be explained, as Deeks and Jobling and Arnold would seem to suggest, as primarily due to the "excessive amount of carbohydrates consumed" by the people living there, then it is difficult to understand why the disease appears to be so rare in—though not entirely absent (8) from—the Orient, where, taking Japan as an example, the diet of the poor seems even more abundantly supplied with carbohydrate than that of the negro farmer of our South (Table XIII) who is relatively quite frequently attacked. Moreover, if the observed beneficial effect of beef were due to a relative diminution of carbohydrate resulting from an increase in the protein, the failure of gelatin when used in quantities yielding even more protein than did the beef is unintelligible.

Since it appears to us that the beneficial effects of beef and of milk can not well be explained on the ground simply of an increase in protein nor, as has been seen, on the ground of a correction of a deficiency of known vitamines and minerals, it follows that the explanation must be sought in the only remaining direction, namely, either in the superior biological and supplementing qualities of the protein of these foods, in some as yet unrecognized diétary complex furnished by them, or in some combination or combinations of these factors.

If, as has elsewhere (3) already been pointed out, the dietary factors now recognized were all that were essential in human nutrition, it would clearly be permissible to conclude that it is the protein (amino acid) mixture that is primarily concerned; but inasmuch as the validity of such assumption is, at least, very doubtful, the possibility is not excluded that an as yet unrecognized dietary complex, alone or in some combination with the protein, plays the beneficial rôle under discussion. We have elsewhere reported (3) a case of pellagra, the progress of which was arrested and the symptoms of which cleared up after a change in diet which, so far as could be judged, involved significantly a modification in only one factor, namely, a marked increase in protein. This would seem strongly to point to the protein (amino acid) mixture as the primary controlling dietary factor. But apparently opposed to this we have the above referred to recent failure to arrest the progress and prevent the fatal outcome of an attack in a patient treated with and consuming daily for a considerable period a milk diet containing approximately 960 grams of

fresh whole milk and 720 grams of fresh buttermilk[2] or approximately 53 grams of milk proteins—a quantity of protein which, if not very liberal, would seem to have been large enough to supply the minimal requirements of all essential amino acids. If it were certain that for this particular patient this quantity of milk proteins actually supplied all needed amino acids, then it might be concluded that the primary controlling dietary factor in pellagra is not the quality of the protein mixture but some heretofore unrecognized factor with which milk is not or may not be very abundantly supplied.

Here we have two seemingly contradictory observations. Can they be harmonized, and how? The seeming contradiction perhaps disappears if we assume that in the first instance the clearing up of symptoms following the increase in the protein was due to a relative increase in supply of the specific, as yet unrecognized, complex resulting from the sparing action of a correction of a serious, nonspecific defect in the diet, namely, a low protein supply. Again, the contradiction disappears if, in connection with the second instance, the possibility is recalled that the protein supply in this particular case was inadequate, not because an insufficient supply was ingested, but because of an inability satisfactorily to utilize it in consequence of the disease process. The determination of which of these explanations, if either, is the true one must wait upon further evidence. Until this is adduced it seems warranted to hold that the primary etiological dietary factor in pellagra is either a faulty protein (amino acid) mixture, or a deficiency in some as yet unrecognized complex, or some combination of these.

SUMMARY.

1. Eight well-marked though not very severe (mainly dermal) cases of pellagra were treated with fresh beef as the only known therapeutic element in the diet.

2. In all eight cases clinical improvement followed the inauguration of the beef treatment.

3. In four of these cases the treatment with beef followed an unsuccessful period of treatment with gelatin, the contrast in results tending to emphasize, on the one hand, the inadequacy of gelatin, and, on the other, the therapeutic potency of fresh beef.

4. The preventive value of milk was tested by daily supplementing the basic diet of a group of 29 inmates of the Georgia State Sanitarium with approximately 40 fluid ounces (1,200 grams) of buttermilk.

5. None of these patients developed any evidence of pellagra at any time during the period of observation, which, for 25 of the group,

[2] Besides the milk it included regularly cottonseed oil 28 grams, cod-liver oil 28 grams, cane sugar 170 grams, canned tomato juice 115 grams, mineral mixture 1 dose (yielding the mineral elements of a liter of milk), table salt 5 grams, sirup iodide of iron (U. S. P.) 2 drops, and, irregularly, about 60 grams of white bread and 60 grams of corn bread per day.

lasted one year, although it is believed that without the buttermilk or equivalent supplement upward of 40 or 50 per cent of the group would have developed pellagra within a period of three to eight months.

6. Fresh meat and milk contain the essential pellagra-preventive factor or factors.

7. It is estimated that about 4 to 4½ ounces (125 grams) of fresh beef (lean round steak) and not over about 40 fluid ounces (1,200 grams) of buttermilk will suffice to prevent pellagra in all but very exceptional instances.

8. Fresh butter (from cows largely pasture fed) ingested daily in quantities averaging approximately 125 to 135 grams (butterfat 100 to 110 grams) failed to prevent pellagra in several instances in which it was tried.

9. Cod-liver oil ingested daily in quantities averaging upward of 2 grams per kilo of body weight failed to prevent pellagra in several instances in which it was tried.

10. The primary etiological dietary factor in pellagra is a faulty protein (amino acid) mixture, a deficiency in some as yet unrecognized dietary complex (possibly a vitamine), or some combination of these.

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Dietary Tables.

TABLE I.—*Approximate composition of therapeutic beef diet offered daily beginning August 19, 1922, to Case 1.*

[Total calories: 2,182.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Corn meal [1]	130	10.9	6.1	96.2
Grits	66	6.1	1.3	49.8
Wheat flour	100	11.4	1.0	75.1
Rice	28	2.2	.1	22.1
Cowpeas [2]	14	3.0	.2	8.5
Lard	28	.....	28.0	.....
Sirup	56	.....	.....	39.8
Cottonseed oil	10	.....	10.0	.....
Supplemental:				
Round steak [3]	200	45.2	21.2	.....
Cod-liver oil [4]	10	.....	10.0	.....
Tomato juice [5]	130	.....	.....	.....
Calcium carbonate [6]	3	.....	.....	.....
Dilute hydrochloric acid (U. S. P.) (90 drops) [7]	.....	.....	.....	.....
Total nutrients	.....	78.8	77.9	291.5
Nutrients per 1,000 calories	.....	36.1	35.7	133.7

[1] Unbolted but sifted in the kitchen.
[2] Served in place of all dry legumes of the general institution diet.
[3] This replaced all animal protein foods ordinarily furnished except the small amount of milk irregularly used in making some of the corn bread.
[4] Increased to 15 grams and 2 drops of the sirup of iodide of iron begun on Sept. 24, 1922.
[5] Juice squeezed from canned tomatoes here replaced the varying and variable issue of fresh vegetables of the general diet.
[6] This with the table salt used freely in seasoning the cooked dishes was given in order to correct the possible mineral defects of the basic diet.
[7] Given in order to correct a possible gastric anacidity so common in pellagrins.

TABLE II.—*Approximate composition of the vitamine-and-mineral-supplemented institution diet offered daily to each of a group of pellagrins without success in preventing recurrences among them. (See also Goldberger and Tanner: J. A. M. A., December 28, 1922 (79), 2132.)*

[Total calories: 2,071.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Corn meal [1]	130	10.9	6.1	96.2
Grits	40	3.7	.8	30.2
Wheat flour	100	11.4	1.0	75.1
Rice	23	1.8	.1	18.2
Cowpeas [2]	28	6.0	.4	17.0
Lard	17	.....	17.0	.....
Butter	15	.....	12.0	.....
Sirup	56	.....	.....	39.8
Sugar	7	.....	.....	7.0
Sweet potatoes [3]	50	.9	.4	14.0
Cabbage [3]	50	.8	.2	2.8
Meat (beef) [4]	56	11.7	5.9	.....
Supplemental:				
Cod-liver oil	30	.....	30.0	.....
Canned tomatoes	100	.....	.....	.....
Yeast cake	14	1.0	.0	2.9
Mineral mixture (1 dose) [5]	.....	.....	.....	.....
Sirup iodide of iron (2 drops)	.....	.....	.....	.....
Dilute hydrochloric acid (U. S. P.) (90 drops) [6]	.....	.....	.....	.....
Total nutrients	.....	78.8	77.9	291.5
Nutrients per 1,000 calories	.....	36.1	35.7	133.7

[1] Unbolted but sifted in the kitchen.

[2] Served in place of all dry legumes of the general institution diet.

[3] Sweet potatoes and cabbage represent the average day to day issue of fresh vegetables, which included sweet potatoes, Irish potatoes, cabbage, greens, turnips, tomatoes, etc., according to season.

[4] Round steak is used to represent the average daily offering by the sanitarium of all the meat in the general diet. The quantity stated is a conservatively maximum estimate of the lean flesh actually coming to the individual patient.

[5] A dose of this mineral mixture was designed to represent the minerals of a liter of milk. (For composition see Goldberger and Tanner: J. A. M. A., 1922 (72), 2132.) The quantity actually offered was 10 per cent in excess of this. Table salt was used in seasoning the cooked dishes.

[6] Given in order to correct a possible gastric anacidity so common in pellagrins.

TABLE III.—*Approximate composition of a therapeutic beef diet offered daily to certain patients during various periods in 1922.*

[Total calories: 2,342.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Corn meal [1]	130	10.9	6.1	96.2
Grits	40	3.7	.8	30.2
Wheat flour	100	11.4	1.0	75.1
Rice	23	1.8	.1	18.2
Cowpeas [1]	28	6.0	.4	17.0
Lard	17	.....	17.0	.....
Butter	15	.....	12.0	.....
Sirup	56	.....	.....	39.8
Sugar	7	.....	.....	7.0
Sweet potatoes [1]	50	.9	.4	14.0
Cabbage [1]	50	.8	.2	2.8
Supplemental:				
Round steak [2]	200	45.2	21.2	.....
Cod-liver oil	30	.....	30.0	.....
Canned tomatoes	100	.....	.....	.....
Yeast (cake)	14	1.0	.0	2.9
Mineral mixture (1 dose) [1]	.....	.....	.....	.....
Sirup iodide of iron (U. S. P.) (2 drops)	.....	.....	.....	.....
Dilute hydrochloric acid (U. S. P.) (90 drops) [1]	.....	.....	.....	.....
Total nutrients	.....	81.7	89.2	303.2
Nutrients per 1,000 calories	.....	35.0	38.1	129.6

[1] See corresponding footnote in Table II.
[2] Replaced all animal protein foods of the general diet except the small amount of milk in some of the corn bread.

TABLE IV.—*Approximate composition of therapeutic beef-supplemented institution diet offered daily to certain patients during various periods in 1922.*

[Total calories: 2,057.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Corn meal [1]	130	10.9	6.1	96.2
Grits	40	3.7	.8	30.2
Wheat flour	100	11.4	1.0	75.1
Rice	23	1.8	.1	18.2
Cowpeas [1]	28	6.0	.4	17.0
Lard	17	.....	17.0	.....
Butter	15	.....	12.0	.....
Sirup	56	.....	.....	39.8
Sugar	7	.....	.....	7.0
Sweet potatoes [1]	50	.9	.4	14.0
Cabbage [1]	50	.8	.2	2.8
Supplemental:				
Round steak [2]	200	45.2	21.2	.....
Dilute hydrochloric acid (U. S. P.) (90 drops) [3]	.....	.....	.....	.....
Total nutrients	.....	80.7	59.2	300.3
Nutrients per 1,000 calories	.....	39.2	28.7	145.8

[1] See corresponding footnote to Table II.
[2] See corresponding footnote to Table III.
[3] See corresponding footnote to Table II.

TABLE V.—*Approximate composition of a therapeutic gelatin diet offered daily to certain patients during various periods in 1922.*

[Total calories: 2,329.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Cornmeal [1]	130	10.9	6.1	96.2
Grits	40	3.7	.8	30.2
Wheat flour	100	11.4	1.0	75.1
Rice	23	1.8	.1	18.2
Cowpeas [1]	23	6.0	.4	17.0
Lard	17	.....	17.0	.....
Butter	15	.....	12.0	.....
Sirup	56	.....	.....	39.8
Sugar	7	.....	.....	7.0
Sweet potatoes [1]	50	.9	.4	14.0
Cabbage [1]	50	.8	.2	2.8
Meat (beef) [1]	56	11.7	5.9	.....
Supplemental:				
Gelatin	71	64.6	.....	.....
Cod-liver oil	30	.....	30.0	.....
Canned tomatoes	100	.....	.....	.....
Yeast (cake)	14	1.0	.0	2.9
Mineral mixture (1 dose) [1]	.....	.....	.....	.....
Sirup iodide of iron (U. S. P.) (2 drops)	.....	.....	.....	.....
Dilute hydrochloric acid (U. S. P.) (90 drops) [1]	.....	.....	.....	.....
Total nutrients	.....	112.8	73.9	303.2
Nutrients per 1,000 calories	.....	48.4	31.7	130.1

[1] See corresponding footnotes to Table II.

TABLE VI.—*Approximate composition of a therapeutic beef diet offered daily to certain patients during various periods in 1922.*

[Total calories: 2,442.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Cornmeal [1]	130	10.9	6.1	96.2
Grits	40	3.7	.8	30.2
Wheat flour	100	11.4	1.0	75.1
Rice	23	1.8	.1	18.2
Cowpeas [1]	23	6.0	.4	17.0
Lard	17	.....	17.0	.....
Butter	15	.....	12.0	.....
Sirup	56	.....	.....	39.8
Sugar	7	.....	.....	7.0
Sweet potatoes [1]	50	.9	.4	14.0
Cabbage [1]	50	.8	.2	2.8
Meat (beef) [1]	56	11.7	5.9	.....
Supplemental:				
Round steak	200	45.2	21.2	.....
Cod-liver oil	30	.....	30.0	.....
Canned tomatoes	100	.....	.....	.....
Yeast (cake)	14	1.0	.0	2.9
Mineral mixture (1 dose) [1]	.....	.....	.....	.....
Sirup iodide of iron (2 drops)	.....	.....	.....	.....
Dilute hydrochloric acid (U. S. P.) (90 drops)	.....	.....	.....	.....
Total nutrients	.....	93.4	95.1	303.2
Nutrients per 1,000 calories	.....	38.3	39.0	124.3

[1] See corresponding foot notes to Table II.

TABLE VII.—*Approximate composition of a therapeutic gelatin diet offered daily to certain patients during various periods in 1922.*

[Total calories: 2,245.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Corn meal [1]	130	10.9	6.1	96.2
Grits	40	3.7	.8	30.2
Wheat flour	100	11.4	1.0	75.1
Rice	23	1.8	.1	18.2
Cowpeas [1]	28	6.0	.4	17.0
Lard	17	.....	17.0	.....
Butter	15	.....	12.0	.....
Sirup	56	.....	.....	39.8
Sugar	7	.....	.....	7.0
Sweet potatoes [1]	50	.9	.4	14.0
Cabbage [1]	50	.8	.2	2.8
Meat (beef) [1]	56	11.7	5.9	.....
Supplemental:				
Gelatin	85	77.4	.....	.....
Cod-liver oil	15	.....	15.0	.....
Canned tomatoes	130	.....	.....	.....
Yeast (cake)	14	1.0	.0	2.9
Mineral mixture (1 dose) [1]	.....	.....	.....	.....
Sirup iodide of iron (2 drops)	.....	.....	.....	.....
Dilute hydrochloric acid (U. S. P.) (90 drops) [1]	.....	.....	.....	.....
Total nutrients	.....	125.6	58.9	303.2
Nutrients per 1000 calories	.....	55.8	26.2	134.8

[1] See corresponding footnotes to Table II.

TABLE VIII.—*Approximate composition of a therapeutic gelatin diet offered daily to Case 4 during a period in 1922.*

[Total calories: 2,381.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Corn meal [1]	130	10.9	6.1	96.2
Grits	40	3.7	.8	30.2
Wheat flour	100	11.4	1.0	75.1
Rice	23	1.8	.1	18.2
Cowpeas [1]	28	6.0	.4	17.0
Lard	17	.....	17.0	.....
Butter	15	.....	12.0	.....
Sirup	56	.....	.....	39.8
Sugar	7	.....	.....	7.0
Sweet potatoes [1]	50	.9	.4	14.0
Cabbage [1]	50	.8	.2	2.8
Meat (beef) [1]	56	11.7	5.9	.....
Supplemental:				
Gelatin	85	77.4	.....	.....
Butter	38	.....	30.4	.....
Canned tomatoes	130	.....	.....	.....
Yeast (cake)	14	1.0	.0	2.9
Mineral mixture (1 dose) [1]	.....	.....	.....	.....
Sirup iodide of iron (2 drops)	.....	.....	.....	.....
Dilute hydrocholoric acid (U. S. P.) (90 drops) [1]	.....	.....	.....	.....
Total nutrients	.....	125.6	74.3	303.2
Nutrients per 1,000 calories	.....	52.8	31.2	127.4

[1] See corresponding footnotes to Table II.

TABLE IX.—*Approximate composition of therapeutic beef diets offered daily to certain patients during various periods in 1922.*

[Total calories: 2,084.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Corn meal [1]	130	10.9	6.1	96.2
Grits	40	3.7	.8	30.2
Wheat flour	100	11.4	1.0	75.1
Rice [1]	23	1.8	.1	18.2
Cowpeas	28	6.0	.4	17.0
Lard	17	.....	17.0	.....
Vegetable cooking oil	15	.....	15.0	.....
Sirup	56	.....	.....	39.8
Sugar	7	.....	.....	7.0
Sweet potatoes [1]	50	.9	.4	14.0
Cabbage [1]	50	.8	.2	2.8
Supplemental:				
Round steak [2]	200	45.2	21.2	.....
Dilute hydrochloric acid (U. S. P.) (90 drops) [1]	.....	.....	.....	.....
Total nutrients	.....	80.7	62.2	300.3
Nutrients per 1,000 calories	.....	38.8	29.9	144.4

[1] See corresponding footnote to Table II.
[2] See corresponding footnote to Table III.

TABLE X.—*Approximate composition of a therapeutic gelatine diet offered daily to Case 8 during a period in 1922.*

[Total calories: 2,253.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Corn meal [1]	130	10.9	6.1	96.2
Grits	40	3.7	.8	30.2
Wheat flour	100	11.4	1.0	75.1
Rice	23	1.8	.1	18.2
Cowpeas [1]	28	6.0	.4	17.0
Lard	17	.....	17.0	.....
Butter	15	.....	12.0	.....
Sirup	56	.....	.....	39.8
Sugar	7	.....	.....	7.0
Sweet potatoes [1]	50	.9	.4	14.0
Cabbage [1]	50	.8	.2	2.8
Supplemental:				
Gelatin	85	77.4	.....	.....
Cod-liver oil	15	.....	15.0	.....
Butter	15	.....	12.0	.....
Canned tomatoes	130	.....	.....	.....
Yeast (cake)	14	1.0	.0	2.9
Mineral mixture (1 dose) [1]	.....	.....	.....	.....
Sirup iodide of iron (2 drops)	.....	.....	.....	.....
Dilute hydrochloric acid (U. S. P.) (90 drops) [1]	.....	.....	.....	.....
Total nutrients	.....	113.9	65.0	303.2
Nutrients per 1,000 calories	.....	50.6	28.9	134.8

[1] See corresponding footnotes to Table II.

TABLE XI.—*Approximate composition of the buttermilk-supplemented diet offered daily to each of a group of colored female patients during 1922.*

[Total calories: 2,194.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Basic:				
Corn meal [1]	130	10.9	6.1	96.2
Grits	66	6.1	1.3	49.8
Wheat flour	100	11.4	1.0	75.1
Rice	28	2.2	.1	22.1
Cowpeas [2]	14	3.0	.2	8.5
Lard	28	.....	28.0	.....
Sirup	56	.....	.....	39.8
Supplemental:				
Buttermilk [3]	1,200	36.0	6.0	57.6
Cod-liver oil	15	.....	15.0	.....
Tomato juice [4]	130	.....	.....	.....
Dilute hydrochloric acid (U. S. P.) (90 drops) [5]	.....	.....	.....	.....
Sirup iodide of iron (U. S. P.) (2 drops)	.....	.....	.....	.....
Total nutrients	.....	69.6	57.7	349.1
Nutrients per 1,000 calories	.....	31.8	26.3	159.4

[1] Unbolted but sifted in kitchen.
[2] Served in place of all dry legumes of the general institution diet.
[3] This replaced all animal protein foods ordinarily furnished except the small amount of milk irregularly used in making some of the corn bread.
[4] Juice squeezed from canned tomatoes replaced the varying and variable issue of fresh vegetables of the general diet.
[5] Given with a view of correcting a possible gastric anacidity so very common in pellagrins.

TABLE XII.—*Composition of a milk diet fed daily for three months to a colored patient without success in preventing an attack of pellagra (see Goldberger and Tanner: J. Am. Med. Assn., 1922 (79), 2132).*

[Total calories: 1,878.]

Diet.		Nutrients.		
Articles of diet.	Quantity (grams).	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Fresh milk	720	23.8	28.8	36.0
Lard	28	.....	28.0	.....
Cod-liver oil	56	.....	56.0	.....
Lactose	43	.....	.....	43.0
Tomato juice	113	.....	.....	.....
Cane sugar	113	.....	.....	113.0
Mineral mixture (1 dose) [1]	.....	.....	.....	.....
Sirup iodide of iron (U. S. P.) (2 drops)	.....	.....	.....	.....
Total nutrients	.....	23.8	112.8	192.0
Nutrients per 1,000 calories	.....	12.6	60.0	102.1

[1] Represents the mineral elements of a liter of milk.

TABLE XIII.—*Comparison of the quantities of the nutrients in the diet of poorer Japanese* [1] *with those in the diet of negroes near Tuskegee, Ala.*[2]

Dietary group.	Nutrients.		
	Protein (grams).	Fat (grams).	Carbohydrate (grams).
Poorer Japanese:			
Total	59	8	468
Per 1,000 calories	27	3.7	214.7
Negroes near Tuskegee, Ala.:			
Total	62	132	436
Per 1,000 calories	19.5	41.5	137.1

[1] Oshima (Kintaro): A digest of Japanese investigations of the nutrition of man. 1905. U. S. Department of Agriculture, Office of Exp. Stations, Bull. No. 159.
[2] Atwater and Woods: Food of the Negro in Alabama, 1897. U. S. Department of Agriculture, Office of Exp. Stations, Bull. No. 38.

THE IMPORTANCE OF OUR KNOWLEDGE OF THYROID PHYSIOLOGY IN THE CONTROL OF THYROID DISEASES.

An Abstract.[1]

By TALIAFERRO CLARK, Surgeon, United States Public Health Service.

The existence of extensive endemic goiter areas revealed by numerous surveys in recent years has brought about a greater appreciation of the lack of knowledge of the physiology of the thyroid, among those interested in and responsible for the control of this disorder. For this reason an article bearing on this important subject by Marine, an acknowledged authority, is of timely interest. The lack of knowledge concerning the thyroid, according to Marine, applies particularly to its influence on other glands of internal secretion and to their influence on it.

"The major function of the thyroid, as we know it, is to provide a means through the iodine-containing hormone for maintaining a higher rate of metabolism than would otherwise exist and for varying this rate." It is necessary for growth and differentiation in the young, but not for the vegetative life of adult animals. Removal of the thyroid in animals causes a lowering of metabolism, which is permanent if the thyroid is completely removed, but if fragments or accessories remain, regeneration occurs and metabolism may again arise to normal.

That the thyroid provides the means for varying the rate of heat production can be shown in several ways: (1) By sufficient or sublethal injury to the suprarenals, which causes a marked increase in heat production provided the thyroid gland is intact, but which is reduced or abolished if the thyroid is first removed; (2) by the

[1] Abstract of an article by David Marine, M. A., M. D., in Archives of Internal Medicine, vol. 32, No. 6, December, 1923, p. 811.

reduced normal rise in heat production during pregnancy and lactation following removal of the thyroid; (3) by the striking increase in heat production following the administration of thyroid gland; and (4) by the decrease in heat production caused by the removal of thyroid.

The thyroid exerts its influence on metabolism by means of a stable iodine containing hormone. This hormone was isolated in crystalline form by Kimball in 1916 and given the name "Thyroxin." Thyroxin is intimately associated with the globulin of the colloid and is stored in the colloid material of the alveoli in variable amounts. Measured as iodine, the maximum store in the normal human thyroid is approximately 1 mg. per gram of fresh gland. The administration of iodine in any form in any manner causes the store to be increased to the maximum.

The thyroid gland exhibits great variations in functional activity to meet the wide variations in metabolism during the life of an animal, particularly in the female. There are variations due to seasonal variations in the store of iodine, which is greater during the summer months than in the late winter and early spring months, with a corresponding increased incidence of thyroid enlargement during the winter and spring months. Thyroid activity is notably increased at puberty, during pregnancy and lactation, during the menopause, during protracted febrile reactions, and following prolonged use of certain diets, particularly those with a high fat and protein content.

Increased activity of the thyroid is associated with a decrease of the iodine store in the gland, provided there is not a corresponding increased intake. When the iodine store falls below 0.1 per cent, thyroid enlargement begins. The maximum store in a normal gland is between 0.5 and 0.6 per cent, and the minimum is about 0.1 per cent. When the iodine store falls below 0.1 per cent, hypertrophic and hyperplastic changes occur. In general, the iodine store varies inversely as the degree of hyperplasia, and if it is higher than 0.1 per cent, no hypertropic changes are found.

An interesting observation, of practical application, made by the author, is that, if one gives a few milligrams of iodine during pregnancy, to cats and dogs, from which most of the thyroid has been removed, the young at birth will have thyroids normal as to weight, histologic structure, and iodine content. He has also been able to obtain from the same animal alternate litters of goitrous and nongoitrous young, merely by withholding or administering iodine. These experimental congenital thyroid hyperplasias are true congenital goiters, and are identical with the spontaneous congenital goiters of man and animals and are dependent on a maternal functional insufficiency of the thyroid. The practical application of

this observation is the administration of iodine in some form to expectant mothers residing in goitrous districts.

In applying the knowledge of thyroid physiology in the control of thyroid diseases, the author divides those diseases into two groups:

1. Thyroid insufficiencies—
   (*a*) Simple goiter (endemic, epidemic, and sporadic).
   (*b*) Myxedema:
      (1) Infantile (cretinism).
      (2) Adult (Gull's disease).
2. Exophthalmic goiter.

This abstract deals with only one group, the simple goiters, a public health problem.

"Simple goiter is compensatory or work hyperplasia of the thyroid gland developing during the course of certain metabolic disturbances of unknown nature, but immediately depending on a relative or absolute deficiency of iodine. It may occur endemically or sporadically in all land and fresh-water animals with the ductless thyroid."

The sudden occurrence of a large number of goiters in man and animals has also been observed.

The essential cause of simple goiter is unknown; the immediate cause is a relative or absolute deficiency in the iodine store. Goiter is a symptom and may result from (1) an increase in the needs of the organism for the iodine containing hormone, as during puberty, pregnancy, and lactation, during menopause, during certain infections and intoxications, following sufficient injury to the interrenal gland (adrenal cortex), or as a result of diets consisting mainly of fat and protein; (2) interference with the absorption and utilization of the normal intake of iodine; or (3) actual deprivation of iodine, either natural or experimental.

Drinking water has long been associated with the occurrence of goiter, but the nature of the association is yet unknown. There is no evidence that goiter is a water-borne infection. However, toxins may indirectly excite thyroid enlargement; but no relationship has been shown to exist between this disorder and chemical substances.

"At present the best conception of the etiology of simple goiter is that it is a compensatory or work hyperplasia immediately dependent on a relative or absolute deficiency of iodine. Whether the deficiency is primary or secondary is unknown. When one recalls that 50 mg. of iodine will maintain the thyroid in a normal state for as long as a year, and that diets rich in fat can quickly exhaust the iodine of the thyroid, it would appear that the iodine deficiency might be considered as the primary, and possibly the essential, cause. Nevertheless, we must still consider the possibility of endemic goiter being due to some chemical agent or toxin acting to divert the normal

iodine intake or to increase the needs of the organism for thyroid activity."

When the iodine store falls below 0.1 per cent, increased vascularity, cell hypertrophy, and hyperplasia occur. The hyperplasia in man is frequently irregular and nodular. These nodules are an integral part of simple goiter in man. "The more differentiated types are functionally active and react with iodine, while the less differentiated fetal adenomas (nodules) have lost more or less completely this characteristic. Adenomatous thyroids are of great importance in clinical medicine because they are so frequently the seat of hemorrhage, cyst formation, calcification, and, most important of all, they form the basis of perhaps 90 per cent of thyroid carcinomas."

The treatment of simple goiter may be considered as preventive and curative.

"Goiter is the easiest and simplest of all known diseases to prevent both in man and in animals." Iodine is effective when administered in any form or manner, but the ideal plan of adminstration is still to be worked out. In private practice the administration of from 15 to 30 c. c. of sirup of hydriodic acid, given in from 0.5 to 1 c. c. doses daily and repeated each spring and autumn, is sufficient.

"In the endemic goiter districts of America, 90 per cent of simple goiter could be eliminated by protecting the mother and fetus during pregnancy, and the child between the ages of 10 and 17 years. The public schools offer almost ideal conditions for carrying out goiter prophylaxis in children; and maternal and fetal thyroid enlargement could be controlled by private physicians and prenatal clinics."

The administration of 30 c. c. of sirup of hydriodic acid, or of an equivalent amount of iodine in any other available form for a period of one month during the first half of pregnancy, will protect the mother and fetus. Desiccated thyroid is too dangerous.

In Switzerland iodostarin tablets containing from 1 to 5 mg. of iodine are extensively used. A tablet is given once a week. "If the entire population is to be protected, iodized table salt is perhaps the most practical method. Sea salt, if used exclusively, or a salt containing 0.2 per cent iodine, if restricted to table use, would seem ample."

With regard to cure, no medical treatment is very satisfactory in long-standing cases. The best results are obtained in the early developmental stages, when the proper administration of iodine will bring about complete relief in a majority of the cases if not complicated by adenomas, hemorrhage, cyst formation, or other pathologic conditions.

Perhaps the most satisfactory plan of medical treatment is to administer from 2 to 4 gm. of desiccated thyroid in 0.2 gm. doses daily,

and, after allowing an interval of two weeks without treatment, to saturate the thyroid with iodine by giving 30 c. c. of sirup of hydriodic acid or its equivalent in iodine in from 1 to 2 c. c. doses daily. This treatment may be repeated every third or sixth month. The maximum reduction will occur in from 6 to 12 months.

In general, neither iodine nor desiccated thyroid should be given when exophthalmic goiter is suspected; though at certain stages this disease is benefited by the administration of iodine in minute doses.

DEATHS DURING WEEK ENDED JANUARY 5, 1924.

Summary of information received by telegraph from industrial insurance companies for week ended January 5, 1924, and corresponding week of 1923. (From the Weekly Health Index, January 12, 1924, issued by the Bureau of the Census, Department of Commerce.)

	Week ended Jan. 5, 1924.	Corresponding week, 1923.
Policies in force	56,023,057	51,758,878
Number of death claims	9,385	7,492
Death claims per 1,000 policies in force, annual rate	8.7	7.5

Deaths from all causes in certain large cities of the United States during the week ended January 5, 1924, infant mortality, annual death rate, and comparison with corresponding week of 1923. (From the Weekly Health Index, January 12, 1924, issued by the Bureau of the Census, Department of Commerce.)

City.	Week ended Jan. 5, 1924.		Annual death rate per 1,000, corresponding week, 1923.	Deaths under 1 year.		Infant mortality rate, week ended Jan. 5, 1924.[2]
	Total deaths.	Death rate.[1]		Week ended Jan. 5, 1924.	Corresponding week, 1923.	
Total	7,506	13.1	14.6	912	1,072	.....
Akron	37	9.3	7.0	3	5	32
Albany [3]	27	11.9	19.7	4	6	88
Atlanta	64	14.7	25.1	9	10	.....
Baltimore [3]	212	14.1	18.5	20	32	87
Birmingham	54	14.0	21.6	5	12	.....
Boston	260	17.5	17.4	32	43	89
Bridgeport	29	10.5	12.3	7	3	109
Buffalo	134	12.8	16.7	16	25	68
Cambridge	38	17.7	18.3	8	6	139
Camden [3]	38	15.7	14.1	8	4	126
Chicago [3]	672	11.9	12.8	89	88	82
Cincinnati	139	17.8	22.2	5	17	31
Cleveland [3]	197	11.3	13.2	26	36	68
Columbus	74	14.5	13.0	10	7	95
Dallas	47	13.0	13.4	7	11	.....
Dayton	40	12.3	15.1	4	5	67
Denver	115	21.7	16.6	15	8	.....
Des Moines	40	14.4	9.3	0	2	.....
Detroit	251	13.1	14.8	50	68	93
Duluth	15	7.2	8.5	1	2	21
Erie	22	9.9	14.3	3	3	62
Fall River [3]	24	10.3	19.4	5	10	70
Flint	11	4.6	11.7	0	7	0
Fort Worth	27	9.5	9.1	4	4	.....
Grand Rapids	31	10.9	13.1	3	4	47

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1922. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, Jan. 4, 1924.

Deaths from all causes in certain large cities of the United States during the week ended January 5, 1924, infant mortality, annual death rate, and comparison with corresponding week of 1923. (From the Weekly Health Index, January 12, 1924, issued by the Bureau of the Census, Department of Commerce)—Contd.

City.	Week ended Jan. 5, 1924.		Annual death rate per 1,000, corresponding week, 1923.	Deaths under 1 year.		Infant mortality rate, week ended Jan. 5, 1924.
	Total deaths.	Death Rate.		Week ended Jan. 5, 1924.	Corresponding week, 1923.	
Houston	32	10.4	10.1	3	4	.....
Indianapolis	71	10.6	12.0	10	8	76
Jacksonville, Fla	33	16.8	15.6	5	3	.....
Jersey City	86	14.4	11.9	15	5	109
Kansas City, Kans	27	12.0	11.0	2	1	40
Kansas City, Mo	99	14.4	15.7	11	19	.....
Los Angeles	267	19.9	16.0	15	19	47
Louisville	77	15.5	16.2	13	14	125
Lowell	30	13.5	10.0	6	7	107
Lynn	29	14.6	10.3	3	2	76
Memphis	66	20.0	21.1	9	15	.....
Milwaukee	55	5.8	10.1	8	16	37
Minneapolis	81	10.1	13.5	10	16	54
Nashville [3]	35	14.8	11.9	3	3	.....
New Bedford	27	10.6	17.6	8	7	125
New Haven	39	11.6	18.4	3	3	39
New Orleans	140	17.8	20.9	15	19	.....
New York	1,393	12.1	13.1	167	177	67
Bronx Borough	149	8.9	11.3	16	26	56
Brooklyn Borough	452	10.7	12.0	52	68	56
Manhattan Borough	650	15.0	15.0	82	64	80
Queens Borough	106	10.0	11.6	16	15	87
Richmond Borough	36	14.4	16.8	1	4	18
Newark, N. J	102	11.9	13.0	26	21	122
Norfolk	30	9.5	10.5	2	4	36
Oakland	53	11.2	10.3	8	2	100
Omaha	47	11.8	14.5	2	8	21
Paterson	28	10.4	21.8	3	9	49
Philadelphia	551	14.7	19.8	69	82	88
Pittsburgh	124	10.3	15.5	10	21	34
Portland, Oreg	76	14.3	12.6	7	4	72
Providence	63	13.5	18.4	5	14	41
Richmond	62	17.6	16.4	7	5	82
Rochester	57	9.1	11.1	8	9	63
St. Louis	210	13.5	14.9	13	15	.....
St. Paul	49	10.5	14.1	9	8	77
Salt Lake City [3]	43	17.4	14.3	8	11	133
San Antonio	42	11.4	19.3	6	10	.....
San Francisco	183	17.4	15.4	6	10	36
Seattle	65	10.7	10.1	9	5	87
Somerville	24	12.5	20.6	2	5	54
Spokane	37	18.4	15.0	1	4	21
Springfield, Mass	37	13.0	14.1	4	1	68
Syracuse	49	13.6	15.0	8	6	89
Tacoma	33	16.7	8.8	6	2	138
Toledo	60	11.3	10.8	4	11	38
Trenton	32	12.9	20.0	1	8	16
Washington, D. C	108	12.9	19.3	16	13	92
Wilmington, Del	22	9.6	17.1	4	7	87
Worcester	52	13.9	11.7	5	8	60
Yonkers	27	12.8	9.4	5	4	109
Youngstown	55	21.7	11.9	8	7	116

[3] Deaths for week ended Friday, Jan. 4, 1924.

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 STATE SUMMARIES.

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

Reports for Week Ended January 12, 1924.

ALABAMA.

	Cases.
Chicken pox	75
Diphtheria	16
Influenza	43
Malaria	8
Measles	415
Mumps	20
Pneumonia	90
Scarlet fever	23
Smallpox	8
Tuberculosis	23
Typhoid fever	7
Whooping cough	26

ARIZONA.

Chicken pox	4
Diphtheria	2
Measles	82
Scarlet fever	15
Tuberculosis	47
Whooping cough	1

ARKANSAS.

Cerebrospinal meningitis	2
Chicken pox	28
Diphtheria	11
Hookworm disease	3
Influenza	122
Malaria	26
Measles	88
Mumps	14
Paratyphoid fever	1
Pellagra	2
Pneumonia	1
Scarlet fever	8
Smallpox	7
Trachoma	1
Tuberculosis	7
Typhoid fever	8
Whooping cough	13

CALIFORNIA.

	Cases.
Cerebrospinal meningitis:	
Pasadena	1
San Francisco	1
Diphtheria	304
Influenza	47
Lethargic encephalitis—Stockton	2
Measles	515
Scarlet fever	250
Smallpox:	
Huntington Park	7
Long Beach	24
Los Angeles	131
Los Angeles County	34
Pomona	9
Scattering	25
Typhoid fever	9

COLORADO.

(Exclusive of Denver.)

Chicken pox	11
Diphtheria	8
Measles	159
Mumps	10
Pneumonia	2
Scarlet fever	18
Septic sore throat	1
Tuberculosis	33
Whooping cough	5

CONNECTICUT.

Chicken pox	146
Diphtheria	66
German measles	3
Influenza	11
Lethargic encephalitis	2
Measles	152
Mumps	110
Ophthalmia neonatorum	4
Pneumonia (lobar)	31

CONNECTICUT—continued.

	Cases.
Scarlet fever	139
Trichinosis	1
Tuberculosis (all forms)	42
Typhoid fever	3
Whooping cough	102

DELAWARE.

Cerebrospinal meningitis—Laurel	1
Chicken pox	9
Diphtheria—Wilmington	8
Influenza	1
Measles	1
Mumps	1
Pneumonia	5
Scarlet fever:	
Wilmington	10
Scattering	4
Tuberculosis	8
Whooping cough	7

FLORIDA.

Diphtheria	7
Influenza	2
Malaria	5
Pneumonia	11
Scarlet fever	2
Smallpox	8
Typhoid fever	4

GEORGIA.

Chicken pox	8
Diphtheria	11
German measles	3
Hookworm disease	2
Influenza	10
Malaria	1
Measles	168
Mumps	29
Pneumonia	28
Scarlet fever	6
Septic sore throat	1
Smallpox	68
Tuberculosis (pulmonary)	5
Typhoid fever	1
Whooping cough	11

ILLINOIS.

Cerebrospinal meningitis—Grundy County	1
Diphtheria:	
Cook County	156
Scattering	95
Influenza	27
Measles	578
Pneumonia	348
Poliomyelitis—Cook County	1
Scarlet fever:	
Cook County	164
Kane County	26
Lake County	15
McLean County	9
Macon County	14
Tazewell County	10
Scattering	111
Smallpox	8
Tuberculosis	315
Typhoid fever	36
Whooping cough	103

INDIANA.

	Cases.
Chicken pox	95
Diphtheria:	
Allen County	14
St. Joseph County	12
Scattering	68
Influenza	31
Measles	573
Pneumonia	32
Scarlet fever:	
Allen County	10
Kosciusko County	8
St. Joseph County	11
Scattering	88
Smallpox:	
Delaware County	42
Grant County	10
Marion County	17
Scattering	41
Trachoma	2
Tuberculosis	27
Typhoid fever	9
Whooping cough	96

IOWA.

Diphtheria	26
Scarlet fever	64
Smallpox	8
Typhoid fever	14

KANSAS.

Chicken pox	193
Diphtheria	57
German measles	1
Influenza	4
Measles	281
Mumps	154
Pneumonia	52
Scarlet fever	97
Smallpox	13
Tuberculosis	38
Typhoid fever	1
Whooping cough	91

LOUISIANA.

Diphtheria	26
Hookworm disease	108
Influenza	57
Measles	201
Pneumonia	39
Scarlet fever	7
Smallpox	21
Tuberculosis	23
Typhoid fever	11

MAINE.

Cerebrospinal meningitis	2
Chicken pox	46
Diphtheria	13
German measles	5
Measles	101
Mumps	10
Pneumonia	11
Scarlet fever	23
Tuberculosis	10
Typhoid fever	1
Vincent's angina	2
Whooping cough	54

MARYLAND.[1]

	Cases.
Cerebrospinal meningitis	1
Chicken pox	229
Diphtheria	63
Dysentery	1
German measles	1
Impetigo contagiosa	2
Influenza	42
Lethargic encephalitis	1
Malaria	3
Measles	78
Mumps	6
Ophthalmia neonatorum	1
Pneumonia (all forms)	103
Scarlet fever	94
Septic sore throat	5
Tuberculosis	78
Typhoid fever	8
Typhus fever	1
Whooping cough	46

MASSACHUSETTS.

Cerebrospinal meningitis	2
Chicken pox	453
Conjunctivitis (suppurative)	17
Diphtheria	215
German measles	16
Influenza	13
Lethargic encephalitis	1
Measles	548
Mumps	322
Ophthalmia neonatorum	17
Pneumonia (lobar)	136
Poliomyelitis	3
Scarlet fever	421
Septic sore throat	3
Tetanus	1
Tuberculosis (all forms)	147
Typhoid fever	5
Whooping cough	119

MICHIGAN.

Diphtheria	230
Measles	674
Pneumonia	177
Scarlet fever	313
Smallpox	116
Tuberculosis	35
Typhoid fever	6
Whooping cough	61

MINNESOTA.

Chicken pox	115
Diphtheria	96
Influenza	1
Measles	310
Pneumonia	9
Scarlet fever	332
Smallpox	63
Tuberculosis	84
Typhoid fever	4
Whooping cough	6

MISSISSIPPI.

Diphtheria	12
Scarlet fever	5
Smallpox	1
Typhoid fever	4

[1] Week ended Friday.

MISSOURI.

	Cases.
Anthrax	1
Cerebrospinal meningitis	1
Chicken pox	64
Diphtheria	69
Influenza	13
Measles	384
Mumps	27
Pneumonia	6
Rabies	3
Scarlet fever	99
Smallpox	8
Trachoma	1
Tuberculosis	40
Typhoid fever	5
Whooping cough	66

MONTANA.

Diphtheria	10
Scarlet fever	44
Smallpox	53
Typhoid fever	1

NEW JERSEY.

Cerebrospinal meningitis	3
Chicken pox	426
Diphtheria	157
Influenza	28
Measles	312
Pneumonia	207
Scarlet fever	163
Smallpox	28
Typhoid fever	6
Whooping cough	75

NEW MEXICO.

Chicken pox	18
Diphtheria	16
Influenza	2
Measles	54
Mumps	7
Pneumonia	9
Scarlet fever	13
Tuberculosis	12
Typhoid fever	2
Whooping cough	2

NEW YORK.

(Exclusive of New York City.)

Cerebrospinal meningitis	1
Diphtheria	206
Influenza	35
Lethargic encephalitis	7
Measles	1,404
Pneumonia	315
Poliomyelitis	3
Scarlet fever	401
Smallpox	4
Typhoid fever	47
Whooping cough	483

NORTH CAROLINA.

Cerebrospinal meningitis	1
Chicken pox	274
Diphtheria	43
German measles	7

NORTH CAROLINA—continued.

	Cases.
Measles	1,274
Scarlet fever	64
Septic sore throat	5
Smallpox	87
Typhoid fever	5
Whooping cough	391

OREGON.

Chicken pox	39
Diphtheria:	
Portland	10
Scattering	20
Influenza	2
Measles	422
Mumps	7
Pneumonia	[1] 10
Scarlet fever	18
Smallpox:	
Portland	8
Scattering	5
Tuberculosis	22
Typhoid fever	3
Whooping cough	10

SOUTH DAKOTA.

Cerebrospinal meningitis	2
Chicken pox	14
Diphtheria	5
Influenza	16
Measles	157
Mumps	10
Pneumonia	10
Scarlet fever	56
Smallpox	1
Tuberculosis	2
Whooping cough	14

TEXAS.

Chicken pox	16
Diphtheria	19
Influenza	31
Measles	7
Mumps	7
Pneumonia	2
Scarlet fever	14

TEXAS—continued.

	Cases.
Tuberculosis	21
Typhoid fever	4
Whooping cough	22

VERMONT.

Chicken pox	62
Diphtheria	1
Measles	106
Mumps	32
Pneumonia	4
Scarlet fever	14
Smallpox	3
Whooping cough	56

WASHINGTON.

Chicken pox	78
Diphtheria:	
King County	9
Scattering	25
German measles	2
Measles	2,577
Mumps	19
Pneumonia	3
Scarlet fever:	
Seattle	16
Scattering	43
Smallpox:	
Pacific County	9
Spokane County	9
Spokane	24
Scattering	6
Tuberculosis	40
Whooping cough	14

WEST VIRGINIA.

Diphtheria	19
Scarlet fever	14
Smallpox	9

WYOMING.

Chicken pox	17
Diphtheria	1
Measles	67
Scarlet fever	5
Whooping cough	13

Reports for Week Ended January 5, 1924.

DISTRICT OF COLUMBIA.

	Cases.
Chicken pox	56
Diphtheria	8
Measles	3
Scarlet fever	16
Smallpox	2
Tuberculosis	14
Typhoid fever	3
Whooping cough	22

NEBRASKA.

Cerebrospinal meningitis	2
Chicken pox	24
Diphtheria	36
German measles	1
Measles	309

NEBRASKA—continued.

	Cases.
Mumps	4
Pneumonia	4
Scarlet fever	30
Septic sore throat	4
Smallpox	1
Tuberculosis	1
Whooping cough	9

NEW JERSEY.

Cerebrospinal meningitis	3
Chicken pox	222
Diphtheria	130
Influenza	31
Measles	230
Paratyphoid fever	1

[1] Deaths.

NEW JERSEY—continued.	Cases.
Pneumonia	181
Poliomyelitis	2
Scarlet fever	128
Smallpox	1
Typhoid fever	15
Whooping cough	92
NORTH DAKOTA.	
Chicken pox	16
Diphtheria	16

NORTH DAKOTA—continued.	Cases.
German measles	7
Influenza	1
Measles	163
Pneumonia	15
Scarlet fever	64
Smallpox	22
Trachoma	7
Tuberculosis	11
Typhoid fever	2
Whooping cough	22

SUMMARY OF CASES REPORTED MONTHLY BY STATES.

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State.	Cerebrospinal meningitis.	Diphtheria.	Influenza.	Malaria.	Measles.	Pellagra.	Poliomyelitis.	Scarlet fever.	Smallpox.	Typhoid fever.
December, 1923.										
Alabama	3	114	339	129	1,392	12	1	72	49	55
Arkansas	3	71	350	191	360	13	.....	23	44	41
District of Columbia	.....	62	7	.....	31	.....	1	115	14	4
Massachusetts	7	1,102	30	1	1,320	2	25	1,550	4	32
North Dakota	1	132	.....	.....	903	.....	2	298	50	16

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923.

CEREBROSPINAL MENINGITIS.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding week of the years 1915 to 1922, inclusive. In instances in which data for the full eight years are incomplete, the median is that for the number of years for which information is available.

City.	Median for previous years.	Week ended Dec. 29, 1923.	
		Cases.	Deaths.
Connecticut:			
Bristol	0	1	.....
Georgia:			
Atlanta	0	1	.....
Illinois:			
Chicago	1	1	.....
Murphysboro	.....	.....	1
Indiana:			
Indianapolis	0	1	.....
Kansas:			
Topeka	0	1	.....
Wichita	0	.....	2
Massachusetts:			
Fall River	0	1	1
Missouri:			
St. Louis	0	.....	1
North Carolina:			
Raleigh	0	.....	1
Ohio:			
Cleveland	0	1	.....
Pennsylvania:			
Braddock	0	1	.....
Uniontown	0	1	.....
Tennessee:			
Nashville	0	1	.....

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

DIPTHERIA.

See p. 123; also Current State summaries, p. 113, and Monthly summaries by States, p. 117.

INFLUENZA.

City.	Cases.		Deaths, week ended Dec. 29, 1923.
	Week ended Dec. 30, 1922.	Week ended Dec. 29, 1923.	
Alabama:			
Birmingham	4	10	.....
Montgomery	.....	4	.....
Tuscaloosa	1	.....	.....
Arkansas:			
Little Rock	.....	1	.....
California:			
Berkeley	1	.....	.....
Glendale	.....	.....	1
Los Angeles	3	13	2
Oakland	.....	1	.....
Sacramento	1	.....	.....
San Francisco	.....	2	1
Santa Ana	1	.....	.....
Santa Cruz	1	.....	.....
Stockton	.....	3	.....
Connecticut:			
Bridgeport	2	1	1
New Britain	13	1	1
New Haven	.....	.....	1
Stonington	1	.....	.....
District of Columbia:			
Washington	6	1	.....
Georgia:			
Albany	12	.....	.....
Atlanta	106	.....	2
Augusta	167	.....	.....
Brunswick	10	.....	.....
Macon	50	.....	.....
Rome	4	.....	.....
Savannah	70	.....	2
Illinois:			
Chicago	12	13	4
Danville	1	.....	.....
Decatur	1	.....	.....
Rockford	.....	.....	1
Indiana:			
Indianapolis	.....	.....	1
Kansas:			
Fort Scott	1	.....	.....
Kentucky:			
Louisville	15	1	.....
Louisiana:			
Baton Rouge	4	.....	.....
Maryand:			
Baltimore	35	10	1
Cumberland	1	.....	.....
Frederick	.....	1	.....
Massachusetts:			
Arlington	1	.....	.....
Boston	35	.....	1
Cambridge	9	2	1
Chelsea	2	.....	.....
Everett	21	.....	.....
Lawrence	1	.....	.....
Lynn	1	.....	.....
New Bedford	1	.....	.....
Newton	2	1	.....
Saugus	2	.....	.....
Springfield	1	1	1
Waltham	.....	1	1
Webster	1	.....	.....
Winthrop	2	.....	.....
Michigan:			
Detroit	5	2	.....
Grand Rapids	.....	1	.....
Highland Park	1	.....	.....
Minnesota:			
Minneapolis	.....	.....	1
Virginia	1	.....	.....
Missouri:			
Kansas City	2	.....	.....
St. Louis	1	1	.....
Montana:			
Great Falls	.....	.....	1
Missoula	1	.....	.....
New Jersey:			
Harrison	1	.....	.....
Jersey City	1	1	.....
Kearny	3	.....	.....
Newark	12	.....	.....
Passaic	1	1	.....
Paterson	2	.....	.....
Trenton	.....	.....	1
New York:			
Albany	4	.....	.....
Buffalo	2	.....	.....
Cohoes	1	.....	.....
Cortland	1	.....	.....
Little Falls	1	.....	.....
Middletown	5	.....	.....
New York	45	42	9
Saratoga Springs	2	.....	.....
Ohio:			
Akron	.....	1	.....
Chillicothe	2	.....	.....
Cincinnati	10	2	2
Cleveland	8	4	2
Hamilton	3	.....	.....
Ironton	13	.....	.....
Toledo	.....	.....	2
Pennsylvania:			
Philadelphia	6	2	5
Pittsburgh	.....	.....	3
Rhode Island:			
Providence	.....	.....	1
South Carolina:			
Charleston	230	.....	.....
Tennessee:			
Chattanooga	4	.....	.....
Nashville	.....	.....	2
Texas:			
Amarillo	.....	1	.....
Dallas	.....	1	1
Virginia:			
Danville	1	.....	.....
Roanoke	16	.....	.....
West Virginia:			
Fairmont	36	2	.....
Wisconsin:			
Kenosha	.....	1	.....
Milwaukee	2	.....	1

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

LETHARGIC ENCEPHALITIS.

City.	Cases.	Deaths.	City.	Cases.	Deaths
Illinois:			New York:		
Chicago	1		New York	6	1
Maryland:			Ohio:		
Baltimore		1	Cleveland		1
Michigan:			Oregon:		
Detroit		1	Portland	2	

MALARIA.

Georgia:			Texas:		
Macon	1		Houston		1

MEASLES.

See p. 123; also Current State summaries, p. 113; and Monthly summaries by States, p. 117.

PELLAGRA.

City.	Cases.	Deaths.	City.	Cases.	Deaths.
Massachusetts:			Pennsylvania:		
Boston	1		Philadelphia		1
North Carolina:			Virginia:		
Raleigh		1	Richmond	1	

PNEUMONIA (ALL FORMS).

Alabama:			Florida:		
Anniston	2	1	St. Petersburg	1	
Birmingham	19	11	Tampa		1
Mobile		1	Georgia:		
Montgomery		1	Albany	2	
Arkansas:			Atlanta	12	10
Little Rock	2		Augusta	3	1
North Little Rock	1		Brunswick		1
California:			Savannah		7
Berkeley		1	Illinois:		
Long Beach		2	Aurora		3
Los Angeles	50	21	Champaign	5	
Oakland		3	Chicago	219	56
Pasadena	3	2	Cicero	1	
Richmond		4	Elgin	1	
Riverside		2	Evanston	1	
Sacramento		4	Forest Park	1	
San Bernardino		1	Freeport	3	
San Diego	5	4	Galesburg		3
San Francisco	16	14	Jacksonville		3
Santa Ana	2	1	La Salle		1
Santa Cruz		1	Oak Park	4	3
Stockton	9	3	Pekin	7	1
Colorado:			Rock Island	2	
Boulder	2		Rockford		2
Denver		10	Springfield		2
Pueblo		2	Urbana	2	
Connecticut:			Indiana:		
Bridgeport	3	1	Elwood		1
Bristol	2	1	Fort Wayne		1
Hartford	3	1	Hammond		2
Meriden	2		Indianapolis		6
Milford	1		Kokomo		4
New Britain	2	1	Logansport		1
New Haven		7	Muncie		2
Norwich	2	1	Terre Haute		3
Waterbury		3	Iowa:		
Delaware:			Burlington	4	1
Wilmington		5	Iowa City	1	
District of Columbia:			Muscatine	1	
Washington		11	Sioux City	2	

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

PNEUMONIA (ALL FORMS)—Continued.

City.	Cases.	Deaths.
Kansas:		
Kansas City	7	
Parsons	2	
Topeka		6
Wichita		2
Kentucky:		
Covington		1
Louisville	7	4
Owensboro	1	
Louisiana:		
New Orleans		10
Shreveport		2
Maine:		
Biddeford		3
Lewiston		1
Portland		6
Sanford	1	
Maryland:		
Baltimore	48	25
Cumberland	2	1
Massachusetts:		
Adams	2	
Arlington		2
Attleboro		1
Belmont		1
Boston		22
Brockton	1	
Cambridge		4
Chelsea		2
Everett		2
Gardner		1
Haverhill	1	
Holyoke	2	1
Leominster	2	
Lowell		3
Malden		1
Medford	1	
Methuen	1	
New Bedford		1
Newton		3
North Adams		1
Northampton	2	1
Peabody		1
Pittsfield	1	
Somerville	6	1
Southbridge		2
Springfield	3	1
Taunton		3
Watertown	1	
Westfield	1	
Winthrop	1	
Worcester		6
Michigan:		
Ann Arbor	3	
Battle Creek		1
Detroit	47	28
Flint		5
Grand Rapids		4
Hamtramck		2
Holland	1	
Ironwood		1
Ishpeming	2	
Jackson	2	
Kalamazoo		1
Pontiac	1	
Saginaw		3
Sault Ste. Marie		2
Minnesota:		
Duluth	6	2
Mankato	2	
Minneapolis		8
St. Cloud	1	
St. Paul		9
Missouri:		
Kansas City	15	10
St. Joseph		4
Montana:		
Billings		1
Great Falls		1
Missoula	6	
Nebraska:		
Omaha		10
New Hampshire:		
Keene		1
Nashua		2
New Jersey:		
Atlantic City	1	
Bayonne	4	
Camden	5	4
Clifton	3	1
East Orange	6	2
Elizabeth		9
Garfield	4	
Hackensack	3	2
Hoboken		2
Jersey City	9	
Kearny	3	
Montclair	5	1
Morristown	1	
Orange	6	
Passaic	2	1
Paterson	3	
Perth Amboy		1
Summit	1	
Trenton	8	4
West Hoboken		1
West New York	3	1
West Orange	1	
New York:		
Albany	5	
Buffalo	25	16
Cohoes		1
Glens Falls		2
Hornell	2	
Hudson	2	1
Ithaca	1	
Jamestown	2	
Lackawanna	2	1
Little Falls		1
Middletown	3	
Mount Vernon	9	1
New York	329	165
Newburgh	5	
Niagara Falls		2
Ossining		1
Peekskill	1	
Rochester	12	9
Schenectady	4	1
Syracuse	15	8
Troy	3	2
White Plains	3	1
Yonkers	3	1
North Carolina:		
Greensboro		3
Raleigh		2
Rocky Mount		1
Salisbury		1
Winston-Salem		3
Ohio:		
Akron	5	
Ashtabula		3
Barberton		2
Cincinnati		11
Cleveland	36	12
Cleveland Heights	2	
Cuyahoga Falls	1	
Dayton	2	
East Cleveland		1
East Youngstown		1
Findlay	1	
Lima		1
Mansfield	3	
New Philadelphia	1	
Niles		1
Piqua		1
Sandusky	2	
Springfield		2
Tiffin		1
Toledo		8
Youngstown		4

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

PNEUMONIA (ALL FORMS)—Continued.

City.	Cases.	Deaths.
Oklahoma:		
Oklahoma		4
Oregon:		
Portland		8
Pennsylvania:		
Philadelphia	71	59
Pittsburgh		38
Rhode Island:		
Cranston		1
Pawtucket		3
Providence		1
South Carolina:		
Charleston		4
Columbia		1
South Dakota:		
Sioux Falls	1	
Tennessee:		
Memphis		6
Nashville		4
Texas:		
Amarillo	3	
Beaumont		3
Dallas	9	6
El Paso		6
Fort Worth		5
Texas—Continued.		
Galveston		1
Houston		8
San Antonio		2
Utah:		
Salt Lake City		3
Virginia:		
Lynchburg		1
Norfolk	3	2
Petersburg		1
Portsmouth		2
Richmond		4
Roanoke		2
West Virginia:		
Bluefield		1
Huntington		1
Wheeling		1
Wisconsin:		
Ashland		1
Beloit		1
Eau Claire	3	
Kenosha	1	
Milwaukee		6
Racine		1
Wausau		1

POLIOMYELITIS (INFANTILE PARALYSIS).

The column headed "Median for previous years" gives the median number of cases reported during the corresponding week of the years 1915 to 1922, inclusive. In instances in which data for the full eight years are incomplete, the median is that for the number of years for which information is available.

City.	Median for previous years.	Week ended Dec. 29, 1923.	
		Cases.	Deaths.
Illinois:			
Chicago	0	1	
Massachusetts:			
Haverhill	0	1	
Minnesota:			
Mankato	0	2	
New York:			
New York	0	2	
Troy	0	1	
Wisconsin:			
Milwaukee	0	2	

RABIES IN ANIMALS.

City.	Cases
California:	
Los Angeles	4
Pasadena	1
Richmond	1
Massachusetts:	
Methuen	1

SCARLET FEVER.

See p. 123; also Current State summaries, p. 113, and Monthly summaries, by States, p. 117.

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

SMALLPOX.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding week of the years 1915 to 1922, inclusive. In instances in which data for the full eight years are incomplete, the median is that for the number of years for which information is available.

City.	Median for previous years.	Week ended Dec. 29, 1923.	
		Cases.	Deaths.
Alabama:			
Birmingham	0	9	.....
California:			
Long Beach	0	13	.....
Los Angeles	1	79	.....
San Diego	0	1	.....
Georgia:			
Atlanta	2	40	.....
Indiana:			
Gary	0	4	.....
Indianapolis	4	9	.....
Michigan City	.....	2	.....
Muncie	0	14	.....
Iowa:			
Clinton	0	13	.....
Davenport	1	2	.....
Des Moines	0	1	.....
Louisiana:			
Shreveport	.....	1	.....
Maine:			
Lewiston	0	1	.....
Michigan:			
Battle Creek	0	3	.....
Detroit	2	17	.....
Grand Rapids	0	3	.....
Hamtramck	0	2	.....
Holland	0	1	.....
Jackson	0	1	.....
Kalamazoo	0	3	.....
Minnesota:			
Duluth	0	10	.....
Minneapolis	11	1	.....
St. Paul	6	11	.....
Missouri:			
St. Joseph	0	1	.....
St. Louis	1	1	.....
Montana:			
Great Falls	0	3	.....
Missoula	0	3	.....
New York:			
Albany	0	2	.....
New York	0	1	.....
North Carolina:			
Durham	0	1	.....
Greensboro	0	6	.....
Raleigh	0	1	.....
North Dakota:			
Grand Forks	0	2	.....
Ohio:			
Cleveland	1	3	.....
East Liverpool	.....	1	.....
Hamilton	0	2	.....
Mansfield	0	1	.....
Middletown	0	1	.....
Newark	0	1	.....
Steubenville	0	2	.....
Toledo	2	1	.....
Youngstown	0	7	.....
Zanesville	0	13	1
Oklahoma:			
Tulsa	3	1	.....
Oregon:			
Portland	5	1	.....
Pennsylvania:			
Chester	0	8	.....
South Carolina:			
Columbia	0	1	.....
Tennessee:			
Knoxville	0	12	.....
Texas:			
Fort Worth	0	1	.....
Texarkana	.....	1	.....
Vermont:			
Burlington	0	2	.....
Washington:			
Seattle	3	1	.....
Tacoma	1	2	.....
Wisconsin:			
Janesville	0	1	.....
Kenosha	0	2	.....
Milwaukee	3	2	.....

TETANUS.

City.	Cases.	Deaths.
Pennsylvania:		
Philadelphia	2	2
Texas:		
Houston	.....	1
West Virginia:		
Huntington	.....	1

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

TUBERCULOSIS.

See p. 123; also Current State summaries, p. 113.

TYPHOID FEVER.

The column headed "Median for previous years" gives the median number of cases reported during the corresponding week of the years 1915 to 1922, inclusive. In instances in which data for the full eight years are incomplete, the median is that for the number of years for which information is available.

City.	Median for previous years.	Week ended Dec. 29, 1923.		City.	Median for previous years.	Week ended Dec. 29, 1923.	
		Cases.	Deaths.			Cases.	Deaths.
California:				New Jersey:			
Los Angeles	0	2	.....	Camden	1	1	.....
Oakland	1	1	1	Hoboken	0	.....	1
San Francisco	1	.....	1	Trenton	0	.....	1
Connecticut:				New York:			
Waterbury	0	1	.....	New York	15	6	3
Florida:				North Tonawanda	0	2	.....
St. Petersburg	0	.....	1	Syracuse	1	2	.....
Illinois:				White Plains	0	1	.....
Chicago	3	14	7	Yonkers	0	1	.....
Galesburg	0	.....	1	Ohio:			
Quincy	0	1	.....	Cleveland	1	2	.....
Indiana:				Newark	0	2	.....
Fort Wayne	0	1	2	Toledo	0	2	.....
Kansas:				Oklahoma:			
Wichita	0	.....	1	Oklahoma	0	1	1
Kentucky:				Pennsylvania:			
Paducah	0	3	.....	Philadelphia	3	2	.....
Louisiana:				Pittsburgh	1	1	.....
New Orleans	3	.....	1	Tennessee:			
Shreveport	.....	2	.....	Memphis	0	.....	1
Maryland:				Texas:			
Baltimore	4	3	.....	Dallas	1	1	.....
Massachusetts:				El Paso	0	1	.....
Beverly	0	1	.....	Virginia:			
Boston	1	2	.....	Richmond	0	1	.....
Fall River	0	1	1	Roanoke	0	1	.....
Malden	0	1	.....	Washington:			
Michigan:				Everett	0	1	.....
Detroit	2	1	.....	Seattle	1	2	.....
Flint	0	1	.....	Tacoma	0	1	.....
Hamtramck	0	.....	1	West Virginia:			
Minnesota:				Wheeling	0	1	1
Minneapolis	1	1	.....	Wisconsin:			
Nebraska:				Ashland	0	.....	2
Omaha	0	1	1	Milwaukee	1	1	1

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Alabama:										
Anniston	17,734	6	.....	.....	.....	.....	.....	.....	.....	4
Birmingham	178,806	60	5	.....	25	.....	1	.....	10	6
Mobile	60,777	25	1	.....	1	.....	.....	.....	.....	2
Montgomery	43,464	7	.....	.....	5	.....	.....	.....	1	.....
Selma	15,589	.....	2	.....	22	.....	.....	.....	1	.....
Tuscaloosa	11,996	.....	1	.....	3	.....	1	.....	.....	.....
Arkansas:										
Fort Smith	28,870	.....	3	.....	.....	.....	1	.....	.....	.....
Little Rock	65,142	.....	6	.....	2	.....	1	.....	4	.....
North Little Rock	14,048	.....	1	.....	.....	.....	.....	.....	.....	.....
California:										
Alameda	28,806	3	3	.....	7	.....	1	.....	.....	.....
Berkeley	56,036	20	8	.....	25	.....	2	.....	.....	1
Glendale	13,536	9	.....	.....	.....	.....	.....	.....	.....	1

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
California—Continued:										
Long Beach	55,593	16	3	.....	3	.....	9	.....	.....	3
Los Angeles	576,673	260	74	5	9	.....	43	.....	57	25
Oakland	216,261	48	26	4	10	.....	5	.....	.....	1
Pasadena	45,354	25	.....	.....	2	.....	1	.....	1	2
Richmond	16,843	.....	4	1	1	.....	.....	.....	.....	.....
Riverside	19,341	11	1	.....	.....	.....	10	.....	.....	.....
Sacramento	65,908	25	2	.....	1	.....	2	.....	.....	3
San Bernardino	18,721	8	3	.....	.....	.....	3	.....	.....	1
San Diego	74,683	39	1	.....	.....	.....	3	1	1	4
San Francisco	506,676	165	84	12	98	1	36	1	27	13
Santa Ana	15,485	3	.....	.....	.....	.....	.....	.....	2	.....
Santa Cruz	10,917	3	.....	.....	6	.....	3	.....	.....	.....
Stockton	40,296	13	4	.....	21	.....	9	.....	28	1
Vallejo	21,107	0	.....	.....	1	.....	10	.....	.....	.....
Colorado:										
Boulder	11,006	2	.....	.....	18	.....	.....	.....	.....	.....
Denver	256,491	76	14	1	21	.....	15	.....	.....	15
Greeley	10,958	1	.....	.....	.....	.....	.....	.....	.....	.....
Pueblo	43,050	16	1	.....	39	.....	4	.....	6	3
Trinidad	10,906	.....	.....	.....	4	.....	.....	.....	.....	.....
Connecticut:										
Bridgeport	143,555	24	8	1	1	.....	6	.....	5	1
Bristol	20,620	5	1	.....	.....	.....	2	.....	.....	1
Fairfield (town)	11,475	0	.....	.....	.....	.....	.....	.....	.....	.....
Greenwich (town)	22,123	.....	1	.....	31	.....	2	.....	.....	.....
Hartford	138,036	29	14	.....	2	.....	33	.....	4	2
Manchester (town)	18,370	3	1	.....	.....	.....	2	.....	.....	.....
Meriden (city)	29,867	.....	4	.....	74	.....	4	.....	.....	.....
Milford (town)	10,193	2	.....	.....	.....	.....	4	.....	.....	.....
New Britain	59,316	13	5	.....	.....	.....	1	.....	.....	.....
New Haven	162,537	39	4	.....	2	.....	14	.....	4	1
New London	25,688	7	.....	.....	1	.....	1	.....	.....	.....
Norwich (city)	22,304	7	1	.....	.....	.....	.....	.....	1	.....
Waterbury	91,715	25	9	3	1	.....	19	.....	.....	.....
Delaware:										
Wilmington	110,168	33	.....	.....	.....	.....	2	1	.....	1
District of Columbia:										
Washington	437,571	142	15	1	10	.....	26	.....	17	10
Florida:										
St. Petersburg	14,237	12	1	.....	27	.....	.....	.....	.....	.....
Tampa	51,608	21	.....	.....	11	.....	.....	.....	.....	3
Georgia:										
Atlanta	200,616	76	4	2	30	2	2	.....	.....	5
Augusta	52,548	19	.....	.....	3	.....	.....	.....	2	2
Brunswick	14,413	2	.....	.....	.....	.....	.....	.....	.....	.....
Macon	52,995	.....	.....	.....	4	.....	1	.....	2	.....
Rome	13,252	.....	.....	.....	5	.....	.....	.....	.....	.....
Savannah	83,252	28	2	.....	16	.....	.....	.....	1	.....
Idaho:										
Boise	21,393	4	.....	.....	.....	.....	1	.....	.....	.....
Pocatello	15,001	3	.....	.....	.....	.....	.....	.....	.....	.....
Illinois:										
Alton	24,682	6	2	.....	.....	.....	.....	.....	1	.....
Aurora	36,397	13	4	1	1	.....	7	.....	1	1
Berwyn	14,150	7	2	1	4	.....	.....	.....	.....	.....
Bloomington	28,725	7	2	.....	7	.....	3	.....	1	.....
Blue Island	11,424	3	.....	.....	1	.....	2	.....	.....	.....
Centralia	12,491	8	1	.....	.....	.....	.....	.....	.....	.....
Chicago	2,701,705	614	137	8	54	.....	109	1	200	34
Cicero	44,995	2	4	.....	.....	.....	.....	.....	2	.....
Elgin	27,454	7	.....	.....	11	.....	1	.....	.....	1
Evanston	37,234	10	1	.....	1	.....	2	.....	1	.....
Forest Park	10,768	3	.....	.....	.....	.....	2	.....	.....	.....
Freeport	19,669	13	1	1	.....	.....	.....	.....	.....	2
Galesburg	23,834	17	1	.....	.....	.....	3	.....	.....	.....
Jacksonville	15,713	8	.....	.....	.....	.....	2	.....	1	1
Kewanee	16,026	4	.....	.....	4	.....	.....	.....	.....	.....
La Salle	13,050	4	1	1	.....	.....	.....	.....	.....	.....
Mattoon	13,552	.....	.....	.....	2	.....	.....	.....	.....	.....
Murphysboro	10,703	4	.....	.....	.....	.....	.....	.....	.....	1
Oak Park	39,858	20	.....	.....	2	.....	2	.....	.....	.....
Pekin	12,086	.....	.....	.....	1	1	.....	.....	.....	.....
Quincy	35,978	5	.....	.....	.....	.....	.....	.....	1	1

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population an. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Illinois—Continued										
Rock Island	35,177	7	2		62					
Rockford	65,651	15	2		2		1			1
Springfield	59,183	12	5				2		3	
Urbana	10,244		1							
Indiana:										
Crawfordsville	10,139	1								
Elwood	10,790	1	1		13					
Evansville	85,264		5				2			
Fort Wayne	86,549	29	11		2		5			1
Frankfort	11,585	1			25					1
Gary	55,378	15	3				8			
Hammond	36,004	9	1				4	1		
Huntington	14,000	4								
Indianapolis	314,194	119	7		4		5		8	7
Kokomo	30,067	9	6				1			1
La Fayette	22,486	5			1					
Logansport	21,626	6								1
Michigan City	19,457	5	2	1						1
Mishawaka	15,195	9					2		1	
Muncie	36,524	15	5	2	1		2			1
Newcastle	14,458	4								1
Richmond	26,765		3				1			
South Bend	70,983	6	6				10		1	
Terre Haute	66,083	23					3			
Iowa:										
Burlington	24,057	9	3		1					
Cedar Rapids	45,566		1				5			
Clinton	24,151		8	1						
Davenport	56,727		19	1	27					
Des Moines	126,468		8	1	8		1			
Dubuque	39,141		6				1			
Iowa City	11,267		1				3			
Muscatine	16,068	3	1		12					
Ottumwa	23,003		4				1			
Sioux City	71,227		9		12		2			
Waterloo	36,230				6		6			
Kansas:										
Atchison	12,630		2		37		1			
Coffeyville	13,452	4					1		1	
Fort Scott	10,693	2			1					
Hutchinson	23,298				1					
Kansas City	101,177		1		20		3		4	
Parsons	16,028			1						
Topeka	50,022	36			2		1		1	2
Wichita	72,217	37	4	1	6		4		2	
Kentucky:										
Covington	57,121	16			2		10			2
Henderson	12,169	5								
Louisville	234,891	61	4		22		2		6	6
Owensboro	17,424						1		1	
Paducah	24,735		2							
Louisiana:										
New Orleans	387,219	133								15
Shreveport	43,874	18	2		26					3
Maine:										
Auburn	16,985	5								
Bangor	25,978								1	
Bath	14,731	1								
Biddeford	18,008	8			2					
Lewiston	31,791	17	1							
Portland	69,272	16	3	1	4					
Sanford (town)	10,691	0					1			
Waterville	13,351				1					
Maryland:										
Baltimore	733,826	185	26	1	38		55		14	14
Cumberland	29,837	11	1							
Frederick	11,066	4	5							
Massachusetts:										
Adams (town)	12,967	2							1	1
Amesbury (town)	10,036	0								
Arlington (town)	18,665	6	1		5		2			
Attleboro	19,731	3								
Belmont (town)	10,749	3			1		1			

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Massachusetts—Continued.										
Beverly	22,561	5	1		10				1	
Boston	748,060	210	74	2	57		111	2	23	10
Braintree (town)	10,580	4	1				1		1	1
Brockton	66,254	10	16				4		3	
Brookline	37,748	8	2		5		6			
Cambridge	109,694	24	10		2		41		4	1
Chelsea	43,184	12	3		1		5		1	
Chicopee	36,214	7	2							1
Clinton	12,979	1	1				1			
Danvers	11,108				2					
Dedham	10,792	2								
Everett	40,120	6	8				3			
Fall River	120,485	28	6				5	1	1	4
Framingham	17,033	8					1		1	
Gardner	16,971	6					1			
Greenfield	15,462	2			3					
Haverhill	53,884	12	2		1		9		1	1
Holyoke	60,203	16	12		10		1		4	
Leominster	19,744	6			1		7			1
Lowell	112,759	27	4	1	1		9		2	1
Lynn	99,148	14			3		7		1	2
Malden	49,103	15	3		1		13			1
Medford	39,038	6	4		1		12		1	1
Melrose	18,204	3	2				12		1	
Methuen	15,189	3	1							
New Bedford	121,217		1				3		7	1
Newburyport	15,618	5	1		1				2	
Newton	46,054	12		1	4		8			
North Adams	22,282	5								
Northampton	21,951	7					2			1
Peabody	19,552	9					5		1	
Pittsfield	41,763	9	7	1	11		4		2	
Plymouth	13,045	1								
Quincy	47,876	10	7				5			
Salem	42,529	9	1	1	1		6			
Somerville	93,091	26	8		1		20		1	1
Southbridge	14,245	5								
Springfield	129,614	34	3		12		11		1	
Taunton	37,137	18			2					
Wakefield	13,925	1					5			
Waltham	30,915	15	5	1	3		4			
Watertown	21,457	2			5		2			
Webster	13,258	1					1			1
West Springfield	13,443	1								
Westfield	18,604								1	
Winchester	10,485	2					2			
Winthrop	15,455	2	1		2		2			
Woburn	16,574	2								
Worcester	179,754	55	13				24		8	3
Michigan:										
Alpena	11,101				17					
Ann Arbor	19,516	12	1		15		2			1
Battle Creek	36,164	2	4				13		1	1
Detroit	993,678	241	75	1	66	2	102		35	23
Flint	91,599	25	5		37		4		1	
Grand Rapids	137,634	26	7		3		10		4	2
Hamtramck	48,615	9	1				2			1
Holland	12,183				10		3			
Ironwood	15,739	3					4	1	4	
Ishpeming	10,500	9			1		3			
Jackson	48,374	15	3						1	1
Kalamazoo	48,487	14	5	1	1		1			
Marquette	12,718	4			3					
Muskegon	36,570	9	4				4	1		1
Pontiac	34,273	9			2		20			
Port Huron	25,944	7			1		4			
Saginaw	61,903	23	2	1	10		11			1
Sault Ste. Marie	12,096	3	1		11					
Minnesota:										
Duluth	98,917	17	3	1	7		12			
Hibbing	15,089						9			
Minneapolis	380,582	98	32	2	4		66	2	25	8
Rochester	13,722				15		1		1	1

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Minnesota—Continued.										
St. Cloud	15,873		8				2			
St. Paul	234,698	55	21	2	13		45	1	8	4
Winona	19,143	5								
Missouri:										
Independence	11,686		3		1		4			
Joplin	29,902		1							
Kansas City	324,410	80	13	2	51		15		11	8
St. Joseph	77,939	26			96	1	3			1
St. Louis	772,897	223	30	1	10		58	2	17	15
Montana:										
Anaconda	11,668	2					3			
Billings	15,100	4			132	1	3			
Great Falls	24,121	10	3		6		8			
Missoula	12,668	5	4		1				1	
Nebraska:										
Lincoln	54,948	7	3	1			1			
Omaha	191,601	45	4	1	8		5			7
Nevada:										
Reno	12,016	1					1			
New Hampshire:										
Berlin	16,104	3								
Concord	22,167	5			14					
Dover	13,029	1			1					
Keene	11,210	6					10			
Nashua	28,379	13			19				1	
New Jersey:										
Asbury Park	12,400	6	1		1		2		3	
Atlantic City	50,707	12	3						1	1
Bayonne	76,754				1		2		3	
Belleville	15,660		3							
Bloomfield	22,019	2							1	
Camden	116,309	30	13				3		3	
Clifton	26,470	4	3				2			
East Orange	50,710	10	2		2		4			
Elizabeth	95,783	8			1		2		2	2
Englewood	11,627	4								
Garfield	19,381	0	1						1	
Hackensack	17,667	10					1			2
Hoboken	68,166	15			1		4		1	
Jersey City	298,103		11		33		13		17	
Kearny	26,724	5	1							
Montclair	28,810	2	3		1					
Morristown	12,548	7					1			
Orange	33,268	2			2				1	
Passaic	63,841	15	3	1			1		1	3
Paterson	135,875		4		11		8		4	
Perth Amboy	41,707	10	1		5		2			
Phillipsburg	16,923	2	1							
Summit	10,174	1								
Trenton	119,289	45	15	1	11		4		6	1
Union (town)	20,651		1				5			
West Hoboken	40,074		1							
West New York	29,926	2	3		2		2			1
West Orange	15,573	2								
New Mexico:										
Albuquerque	15,157	7	2							2
New York:										
Albany	113,344		16		4		27		5	
Amsterdam	33,524	4	2		25		2			
Buffalo	506,775	122	23	1	11		22		11	7
Cohoes	32,987	4			13		1			
Geneva	14,648	4								
Glens Falls	16,638	6					1			
Hornell	15,025	2								
Hudson	11,745	7								
Ithaca	17,004	5			1		1			
Jamestown	38,917	11	2				10			3
Lackawanna	17,918	2			7				2	1
Little Falls	13,029	1								
Lockport	21,308	4			5		7	1		
Middletown	18,420								2	

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
New York—Continued.										
Mount Vernon	42,726	11	.....	.....	3	.....	.....	.....	.....	.....
New York	5,620,048	1,313	197	7	298	9	152	2	[1]105	[1]93
Newburgh	33,366	6	.....	.....	.....	.....	1	.....	1	.....
Niagara Falls	50,760	14	5	1	7	.....	3	.....	2	.....
North Tonawanda	15,482	1	1	.....	.....	.....	10	.....	.....	.....
Olean	20,506	2	.....	.....	.....	.....	2	.....	.....	.....
Ossining	10,739	6	.....	.....	.....	.....	.....	.....	.....	.....
Peekskill	15,868	7	2	.....	.....	.....	3	.....	1	1
Rochester	295,750	66	11	.....	2	.....	10	.....	10	.....
Rome	26,341	9	3	.....	67	.....	3	.....	.....	1
Saratoga Springs	13,181	4	1	.....	1	.....	2	.....	.....	1
Schenectady	88,723	19	22	.....	64	.....	13	1	2	2
Syracuse	171,717	43	7	1	39	.....	35	.....	.....	.....
Troy	72,013	31	24	1	38	.....	.....	.....	2	1
White Plains	21,031	6	1	.....	.....	.....	.....	.....	1	1
Yonkers	100,176	20	6	.....	3	.....	1	.....	.....	3
North Carolina:										
Durham	21,719	5	.....	.....	2	.....	.....	.....	.....	.....
Greensboro	43,525	13	1	.....	3	.....	1	.....	.....	.....
Raleigh	24,418	20	2	1	2	.....	1	.....	.....	1
Rocky Mount	12,742	5	.....	.....	.....	.....	.....	.....	.....	.....
Salisbury	13,884	8	.....	.....	.....	.....	.....	.....	.....	2
Winston-Salem	48,395	15	1	.....	108	.....	2	.....	1	3
North Dakota:										
Grand Forks	14,010	.....	1	.....	.....	.....	5	.....	.....	.....
Ohio:										
Akron	208,435	32	17	.....	1	.....	12	.....	20	.....
Alliance	21,603	5	.....	.....	.....	.....	1	.....	1	1
Ashtabula	22,082	6	.....	.....	.....	.....	.....	.....	.....	.....
Barberton	18,811	5	.....	.....	4	.....	2	.....	.....	.....
Bellaire	15,061	8	1	1	.....	.....	.....	.....	2	.....
Bucyrus	10,425	2	.....	.....	.....	.....	.....	.....	1	1
Cambridge	13,104	8	.....	.....	.....	.....	2	.....	.....	3
Chillicothe	15,831	6	1	1	.....	.....	2	.....	.....	.....
Cincinnati	401,247	120	5	.....	27	.....	7	.....	10	6
Cleveland	796,841	149	29	1	11	.....	37	1	24	9
Cleveland Heights	15,236	.....	.....	.....	1	.....	1	.....	.....	.....
Cuyahoga Falls	10,200	.....	1	.....	.....	.....	.....	.....	.....	.....
Dayton	152,559	36	8	.....	.....	.....	11	.....	1	.....
East Cleveland	27,292	9	.....	.....	.....	.....	1	.....	.....	.....
East Liverpool	21,411	.....	.....	.....	.....	.....	6	.....	.....	.....
East Youngstown	11,237	2	.....	.....	.....	.....	.....	.....	.....	.....
Findlay	17,021	6	.....	.....	.....	.....	4	.....	.....	.....
Fremont	12,468	3	1	.....	.....	.....	3	1	.....	.....
Hamilton	39,675	13	.....	.....	.....	.....	1	.....	.....	2
Kenmore	12,683	.....	1	.....	.....	.....	.....	.....	.....	.....
Lima	41,326	7	.....	.....	4	.....	2	.....	.....	.....
Lorain	37,295	.....	.....	.....	.....	.....	8	.....	.....	.....
Mansfield	27,824	5	1	.....	.....	.....	1	.....	.....	.....
Martins Ferry	11,634	3	1	.....	.....	.....	1	.....	.....	.....
Middletown	23,594	5	.....	.....	.....	.....	.....	.....	.....	.....
New Philadelphia	10,718	.....	.....	.....	11	.....	3	.....	.....	.....
Newark	26,718	9	.....	.....	.....	.....	1	.....	.....	2
Niles	13,080	4	3	.....	.....	.....	.....	.....	.....	.....
Norwood	24,966	3	.....	.....	.....	.....	.....	.....	.....	.....
Piqua	15,044	4	.....	.....	.....	.....	.....	.....	.....	.....
Salem	10,305	3	1	.....	.....	.....	1	.....	.....	.....
Sandusky	22,897	2	.....	.....	1	.....	4	.....	.....	.....
Springfield	60,840	8	.....	.....	.....	.....	9	.....	.....	.....
Steubenville	28,508	12	2	.....	.....	.....	.....	.....	.....	.....
Tiffin	14,375	7	.....	.....	.....	.....	.....	.....	.....	.....
Toledo	243,164	70	18	1	15	.....	17	.....	4	6
Youngstown	132,358	30	14	1	.....	.....	10	1	.....	2
Zanesville	29,569	12	.....	.....	2	.....	1	.....	.....	1
Oklahoma:										
Oklahoma	91,295	24	4	1	10	.....	1	.....	.....	.....
Shawnee	15,348	5	2	.....	9	.....	3	.....	.....	.....
Tulsa	72,075	.....	3	.....	1	.....	2	.....	.....	.....
Oregon:										
Portland	258,288	57	32	2	295	1	3	.....	6	2

[1] Pulmonary only.

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Pennsylvania:										
Allentown	73,502		9		5		4			
Altoona	60,331		5		1		2			
Ambridge	12,730		2				6			
Beaver Falls	12,802		2		6		2			
Berwick	12,181		1							
Bethlehem	50,358		7				1			
Braddock	20,879		2							
Bradford	15,525				12		1			
Butler	23,778		2				2			
Canonsburg	10,632		1				2			
Carbondale	18,640				6					
Carrick	10,504		1				2			
Chester	58,030		10				2			
Coatesville	14,515						1		11	
Columbia	10,836		1				1			
Connellsville	13,804		3				5			
Dubois	13,681		1				1			
Duquesne	19,011		1		1		1			
Easton	33,813		3		1		4			
Erie	93,372		6		13		26		6	
Farrell	15,586		11							
Greensburg	15,033						1			
Harrisburg	75,917		4		6		5			
Hazelton	32,277		1		1		2			
Homestead	20,452						1			
Jeannette	10,627		2				4			
Johnstown	67,327		10		3		7			
Lancaster	53,150		1				4		1	
McKee's Rocks	16,713						1			
McKeesport	46,781		1							
Meadville	14,568						1			
Monessen	18,179		3							
Mount Carmel	17,469		1						2	
Nanticoke	22,614		2							
New Castle	44,938				7					
New Kensington	11,987		2				2			
Norristown	32,319		1							
North Braddock	14,928		3		7		1			
Oil City	21,274		1		1		4			
Philadelphia	1,823,779	473	93	9	33		36	1	63	41
Pittsburgh	588,343	180	39	3	7		29	3		7
Plymouth	16,500		2							
Pottsville	21,876		1				1		1	
Reading	107,784		8		1		2		4	
Scranton	137,783		5		14		4			
Shamokin	21,204		4							
Sharon	21,747		3				2			
Shenandoah	24,726		2							
Steelton	13,428		1		4		2			
Sunbury	15,721		1				1			
Swissvale	10,908		2							
Tamaqua	12,363		1		1					
Uniontown	15,692		2				2			
Warren	14,272						6			
Washington	21,480				45		3			
Wilkes-Barre	73,833		6		2		1		2	
Wilkinsburg	24,403		1		1				1	
Williamsport	36,198		1		51		1			
Woodlawn	12,495		1							
York	47,512						1			
Rhode Island:										
Cranston	29,407	2					2			
Cumberland (town)	10,077	2	1						2	2
Newport	30,255	5								1
Pawtucket	64,248	18	2				3			
Providence	237,595	58	10	1	2		57			5
South Carolina:										
Charleston	67,957	22			30					3
Columbia	37,524	14		1	72					1
South Dakota:										
Sioux Falls	25,202	3			75		2			

CITY REPORTS FOR WEEK ENDED DECEMBER 29, 1923—Continued.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS—Continued.

City.	Population Jan. 1, 1920.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Tennessee:										
Knoxville	77,818				28		2		1	1
Memphis	162,351	53	5		18		5	1	6	5
Nashville	118,342	38	2		5		6		1	2
Texas:										
Amarillo	15,494	6								
Beaumont	40,422	7					4			
Corpus Christi	10,522	4								
Dallas	158,976	44	20	2	190	1	5		3	2
El Paso	77,560	35	1				4		8	8
Fort Worth	106,482	32	1		4		4			2
Galveston	44,255	7					1			
Houston	138,276	46	3		1		6			3
San Angelo	10,050	8								5
San Antonio	161,379	38	3	1	1		1		1	9
Texarkana	11,480		1		8		3			
Waco	38,500	8								1
Utah:										
Provo	10,303	5	2				1		1	
Salt Lake City	118,110	30	1		16		1		10	1
Vermont:										
Barre	10,008	3					2			
Burlington	22,779	3					1			
Virginia:										
Alexandria	18,060	4					1			1
Charlottesville	10,688	1	1				1			
Danville	21,539	6	3							
Lynchburg	30,070	6	3		1		1			
Newport News	35,596	6			3		1		2	1
Norfolk	115,777				72		3		2	3
Petersburg	31,012	4	2				1		1	
Portsmouth	54,387	10			1					
Richmond	171,667	62	3		4		10		5	5
Roanoke	50,842	19	2		2		3		1	
Washington:										
Aberdeen	15,337						1			
Bellingham	25,585		1		8		1			
Everett	27,644				17		3			
Seattle	315,312		5		426		12		7	
Spokane	104,437				416					
Tacoma	96,965		7		57		5			
Vancouver	12,637				2					
Walla Walla	15,503		5							
Yakima	18,539				46					
West Virginia:										
Bluefield	15,282	4								1
Charleston	39,608	15	1	1			2		1	2
Clarksburg	27,869	2	1				2			
Fairmont	17,851						1			
Huntington	50,177	18						2	4	1
Morgantown	12,127		1				1			
Wheeling	56,208	16	4	1	1		5	1	1	1
Wisconsin:										
Appleton	19,561	10					2			
Ashland	11,334	6					1			
Beloit	21,284	5			1		2			
Eau Claire	20,906				4		8			
Fond du Lac	23,427	4					1			
Green Bay	31,017		3		4		11			
Janesville	18,293	4					1			
Kenosha	40,472	6	5				3		1	
La Crosse	30,421				3		4			
Madison	38,378	4	7		1		4		2	
Manitowoc	17,563		2		2		1			
Marinette	13,610		1		12					
Milwaukee	457,147	77	19		1		23	2	6	4
Racine	58,593	13	4		2		19	1	1	
Sheboygan	30,955	11	2		1		10			
Stevens Point	11,371						8			
Superior	39,671	9					6			
Waukesha	12,558	3	1				2			
Wausau	18,661		4		1		7			
West Allis	13,745		2						1	

FOREIGN AND INSULAR.

AZORES.

Plague—St. Michael Island.

During the three weeks ended November 10, 1923, 9 cases of plague with 5 deaths were reported in the Island of St. Michael, occurring at localities situated from 3 to 9 miles from the port of Ponta Delgada.

CANADA.

Communicable Diseases—Ontario—December, 1923 (Comparative).

Communicable diseases were notified in the Province of Ontario, Canada, during the month of December, 1923, as follows:

Disease.	December, 1923.		December, 1922.	
	Cases.	Deaths.	Cases.	Deaths.
Cerebrospinal meningitis	1	1	6	6
Chancroid	9	.....	3	.....
Chicken pox	1,087	.....	(a)	.....
Diphtheria	457	24	315	10
Gonorrhea	169	.....	179	.....
Influenza	13	9	.....	18
Lethargic encephalitis	3	2	(a)	
Measles	762	2	359	1
Mumps	306	1	(a)	.....
Pneumonia	.....	128	.....	282
Poliomyelitis (infantile paralysis)	2	1	4	1
Scarlet fever	1,060	18	449	14
Septic sore throat	17	2	(a)	.....
Smallpox	51	.....	51	1
Syphilis	167	.....	133	.....
Tuberculosis	166	85	196	112
Typhoid fever	49	11	54	17
Whooping cough	179	6	234	8

a Not reported in 1922.

CANARY ISLANDS.

Plague-Preventive Measures—Vaccination—Las Palmas.[1]

According to information dated December 5, 1923, the sanitary measures in force at Las Palmas with regard to vessels are the use of rat guards, fumigation of vessels not showing certificate of fumigation within six months, and vaccination of all persons working on board vessels.

CHILE.

Mortality—Concepcion—October, 1923.

During the month of October, 1923, 278 deaths (including 15 stillbirths), of which 99 were in children under one year of age, were reported at Concepcion, Chile. Certain causes of deaths were stated

[1] See Public Health Reports, Jan. 11, 1924, p. 79.

as follows: Bronchopneumonia, 8 deaths; croup, 3; heart affections, 22; influenza, 8; pneumonia, 77; smallpox, 7; tuberculosis, 26; typhus fever, 1.

CUBA.

Communicable Diseases—Habana.

Communicable diseases have been notified at Habana as follows:

Disease.	Dec. 21-31, 1923.		Remaining under treatment Dec. 31, 1923.
	New cases.	Deaths.	
Chicken pox	9	.....	2
Diphtheria	20	3	8
Leprosy	1	.....	14
Malaria	70	1	[1]32
Measles	4	.....	5
Scarlet fever	3	.....	2
Typhoid fever	11	4	[2]16

[1] From the interior, 27.
[2] From the interior, 12.

GREAT BRITAIN.

Foot-and-Mouth Disease—Birmingham District.

Information received under date of December 8, 1923, shows prevalence of foot-and-mouth disease among the cattle in the Birmingham district, England.

HAWAII.

Rodent Plague—Paauhau.

A case of rodent plague was discovered December 14, 1923, at the Paauhau Sugar Plantation, Hawaii.

HUNGARY.

Communicable Diseases—July-August, 1923.

Communicable diseases were notified in Hungary during the months of July and August, 1923, as follows:

Disease.	July.		August.	
	Cases.	Deaths.	Cases.	Deaths.
Cerebrospinal meningitis	4	.....	2	2
Diphtheria	101	11	118	9
Lethargic encephalitis	1	1	.....	.....
Measles	1,551	43	397	31
Scarlet fever	267	28	297	41
Typhoid fever	[a]221	26	[a]482	48
Typhus fever	12	.....	12	.....
Whooping cough	354	19	267	31

[a] Including paratyphus fever.

Dysentery.

During the same period 198 cases of dysentery with 37 deaths, occurring during the month of July, 1923, and 782 cases with 96 deaths, occurring during the month of August, 1923, were notified in Hungary.

JAMAICA.[1]

Smallpox (Reported as Alastrim).

During the week ended December 15, 1923, 59 cases of smallpox (reported as alastrim) were reported in the Island of Jamaica. Of these, one case was notified at Kingston.

Typhoid Fever—Kingston and Vicinity.

During the same period, 18 cases of typhoid fever were reported at Kingston and 5 cases in the surrounding country.

JAVA.

Plague—October, 1923.

During the month of October, 1923, 902 deaths from plague were reported in the Island of Java. For distribution of occurrence, according to provinces, see page 135.

MADAGASCAR.

Plague—October 1–15, 1923.

During the period October 1 to 15, 1923, 54 cases of plague with 50 deaths were reported in the Province of Tananarive, Madagascar. Of these, 22 cases with 22 deaths were notified in the town of Tananarive. Of the total number of cases reported, 11 were bubonic, 21 pneumonic, and 22 septicemic. All the cases reported occurred in natives.

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[1] Report of smallpox in Jamaica appearing in Public Health Reports of Jan. 4, 1924, p. 42, as for week ended Dec. 8, 1923, should have been for week ended Dec. 1, 1923.

PANAMA CANAL.

Communicable Diseases—November, 1923.

Communicable diseases were reported for the Panama Canal during the month of November, 1923, as follows:

Disease.	Canal Zone.	Colon.	Panama.	Nonresident.	Total.
Chicken pox	9	3	6	.....	18
Diphtheria	1	1	1	.....	3
Dysentery	.....	2	2	3	7
Hookworm infection	6	6	21	35	68
Malaria	72	5	3	11	91
Measles	2	9	50	1	62
Meningitis	1	.....	.....	.....	1
Pneumonia	.....	6	35	.....	41
Scarlet fever	.....	.....	.....	2	2
Typhoid fever	.....	1	.....	2	3
Tuberculosis	8	4	16	10	38
Whooping cough	2	1	4	.....	7
Yaws	.....	1	.....	1	2

PORTUGUESE WEST AFRICA.

Plague—Angola, Loanda.

During the period October 8 to 28, 1923, 12 deaths from plague were notified at Loanda, Angola, Portuguese West Africa.

SPAIN.

Plague—Malaga.

Under date of December 17, 1923, two cases of plague were reported at Malaga, Spain.

SUMATRA.

Malaria—Batoe Bahra.

Malaria has been reported at Batoe Bahra, Sumatra, as follows: Month of July, 1923—129 cases with 17 deaths; month of August, 1923—101 cases with 19 deaths.

UNION OF SOUTH AFRICA.

Smallpox—Typhus Fever—October, 1923.

During the month of October, 1923, 41 cases of smallpox with two deaths, occurring among the colored population, and three cases occurring in the white population were reported in the Union of South Africa. During the same period there were reported 287 cases of typhus fever with 58 deaths among the colored population and two cases in the white population. For distribution of cases according to locality, see page 136.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER.

The reports contained in the following tables must not be considered as complete or final as regards either the lists of countries included or the figures for the particular countries for which reports are given.

Reports Received During Week Ended January 18, 1924.[1]

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
India		1		Oct. 28-Nov. 10, 1923: Cases, 1,774; deaths, 1,110.
Rangoon	Nov. 25-Dec. 1	1	1	

PLAGUE.

Azores:				
St. Michael Island	Oct. 20-Nov. 10	9	5	At localities from 3 to 9 miles from port of Punta Delgada.
Ceylon:				
Colombo	Nov. 18-24	2	3	Plague rodents, 6.
Hawaii:				
Paauhau				Dec. 14, 1923: One plague rat.
India				Oct. 28-Nov. 10, 1923: Cases, 7,967; deaths 5,518.
Bombay	Nov. 11-17	1	2	
Karachi	Nov. 26-Dec. 1	7	4	
Java				Oct. 1-31, 1923: Deaths, 902.
Province—				
Djokjakarta	Oct. 1-31		56	
Kedoe	do		252	
Pekalongan	do		25	
Samarang	do		218	
Soerabaya	do		3	
Soerakarta	do		348	
Madagascar:				
Tananarive Province	Oct. 1-15	32	28	Localities not specified. Natives.
Tananarive Town	do	22	22	Bubonic, pneumonic, septicemic.
Portuguese West Africa:				
Angola—				
Loanda	Oct. 8-28		12	
Spain:				
Malaga	Dec. 17	2		
Straits Settlements:				
Singapore	Nov. 18-24	1	1	

SMALLPOX.

Brazil:				
Pernambuco	Nov. 4-24	14	2	
British East Africa:				
Uganda	Sept. 1-30	6	1	
Canada:				
British Columbia—				
Vancouver	Dec. 2-22	7		
Manitoba—				
Winnipeg	Dec. 16-22	2		
Ontario				Dec. 1-31, 1923: Cases, 51.
Fort William and Port Arthur.	Dec. 16-22	2		Occurring at Fort William.
Chile:				
Concepcion	Oct. 1-31		1	
China:				
Amoy	Nov. 25-Dec. 1			Present.
Chungking	Nov. 18-24			Do.
Egypt:				
Port Said	Nov. 26-Dec. 2	1		
India				Oct. 28-Nov. 10, 1923: Cases, 1,408; deaths, 324.
Bombay	Nov. 11-17	5	3	
Rangoon	Nov. 25-Dec. 1	2	1	
Jamaica				Dec. 9-15, 1923: Cases, 59 (reported as alastrim).
Kingston	Dec. 9-15	1		
Java:				
East Java—				
Soerabaya	Oct. 28-Nov. 3	110	14	
West Java—				
Batavia	Nov. 3-9	3	1	

[1] From medical officers of the Public Health Service, American consuls, and other sources. For reports received from June 30 to Dec. 28, 1923, see Public Health Reports for Dec. 28, 1923. The tables of epidemic diseases are terminated semiannually and new tables begun.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received During Week Ended January 18, 1924—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Mexico:				
Mexico City	Nov. 25–Dec. 1	6		
Vera Cruz	Dec. 17–23		2	
Portugal:				
Lisbon	Dec. 3–15	2	1	
Union of South Africa				Oct. 1–31, 1923: Colored, cases, 41; deaths, 2; white, cases, 3.

TYPHUS FEVER.

Chile:				
Concepcion	Oct. 1–31		1	
China:				
Antung	Dec. 3–9	1		
Chungking	Nov. 18–24			Present.
Hungary				July 1–Aug. 31, 1923: Cases, 24.
Mexico:				
Mexico City	Nov. 25–Dec. 1	19		Including municipalities in Federal district.
Union of South Africa				Oct. 1–31, 1923: Colored, 287 cases, 58 deaths; white, 2 cases; total, 289 cases, 58 deaths.
Cape Province				Oct. 1–31, 1923: Colored, cases, 245; deaths, 47.
Do	Nov. 11–17			Outbreaks.
Natal				Oct. 1–31, 1923: Colored, cases, 4; deaths, 3.
Orange Free State				Oct. 1–31, 1923: Colored, cases, 25; deaths, 8.
Transvaal				Oct. 1–31, 1923: Colored, cases, 13.

Reports Received from December 29, 1923, to January 11, 1924.[1]

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
India				Oct. 14–27, 1923: Cases, 1,569; deaths, 1,107.
Calcutta	Nov. 11–17	10	7	
Rangoon	Nov. 11–17	1	1	

PLAGUE.

Bolivia:				
La Paz	Oct. 1–31		3	
Brazil:				
Bahia	Nov. 11–17	1	1	
British East Africa:				
Kenya—				
Mombasa	Oct. 14–20	1	1	Infected rats, 2.
Uganda	Aug. 1–Sept. 30	218	211	
Canary Islands:				
San Juan de la Rambla	Dec. 11	1		Locality 52 km. from Teneriffe.
Ceylon:				
Colombo	Nov. 11–17	2		Plague rodents, 5.
Ecuador:				
Guayaquil	Nov. 16–30	4	2	Rats taken: 18,316; found infected, 37.
Jipijapa	....do			Present.
Egypt:				
City—				
Alexandria	Nov. 26–Dec. 2	2	1	

[1] From medical officers of the Public Health Service, American consuls, and other sources. For reports received from June 30 to Dec. 28, 1923, see Public Health Reports for Dec. 28, 1923. The tables of epidemic diseases are terminated semiannually and new tables begun.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from December 29, 1923, to January 11, 1924—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
India				Oct. 14-27, 1923: Cases, 3,705; deaths, 1,775.
Bombay	Oct. 28-Nov. 3	1		
Karachi	Nov. 11-24	21	19	
Madras Presidency	Nov. 4-24	305	201	
Rangoon	Nov. 4-17	5	3	
Iraq:				
Bagdad	Nov. 11-17	1		
Madagascar:				
Tananarive	Oct. 16-29		11	European, 2 cases, pneumonic.
Peru				Nov. 1-30, 1923: Cases, 23; deaths, 18.
Locality—				
Canete	Nov. 1-30	1	1	
Chepen	do	1		
Chiclayo	do	1	1	
Lima (city)	do	15	12	
Lima (country)	do	4	4	
Lurin	do	1		
Siam:				
Bangkok	Nov. 4-10	1	1	
Syria:				
Beirut	Nov. 1-10	1		

SMALLPOX.

Algeria:				
Algiers	Nov. 1-30	1		
Bolivia:				
La Paz	Oct. 1-Nov. 30	20	10	
Brazil:				
Rio de Janeiro	Nov. 18-24	3	1	
Sao Paulo	Sept. 3-9	1		
British East Africa:				
Tanganyika Territory	Sept. 30-Oct. 20	8	1	
Zanzibar	Sept. 1-30	85	3	In areas 27 miles from town of Zanzibar.
Canada:				
Manitoba—				
Winnipeg	Nov. 25-Dec. 15	16	3	
New Brunswick—				
Madawaska County	Dec. 8-15	1		
Saskatchewan—				
Regina	Dec. 9-15	1		
Ceylon:				
Colombo	Nov. 11-17	1		Port case.
Chile:				
Concepcion	Nov. 12-Dec. 3		5	
Talcahuano	Nov. 26-Dec. 2	3		
China:				
Amoy	Nov. 18-24			Present.
Chungking	Nov. 2-17			Present and endemic.
Hongkong	Oct. 28-Nov. 3	47	43	
Manchuria—				
Harbin	Nov. 12-18	2		
Shanghai	Dec. 29			Prevalent.
Colombia:				
Buenaventura	Nov. 18-Dec. 1	6		
Ecuador:				
Esmeraldas	Nov. 16-30	4		
Greece:				
Saloniki	Oct. 22-Nov. 4		7	
Guadeloupe (West Indies):				
Basse Terre	Dec. 18			Present.
Marie Galante	do			Off shore island; present.
Pointe à Pitre	do			Present in vicinity.
India				Oct. 14-27, 1923: Cases, 1,247; deaths, 224.
Bombay	Oct. 28-Nov. 10	16	4	
Madras	Nov. 4-24	4	1	
Rangoon	Nov. 4-17	4	1	
Iraq:				
Bagdad	Oct. 24-Nov. 17	14	8	
Jamaica				Nov. 25-Dec. 8, 1923: Cases, 34.
Kingston	Nov. 25-Dec. 1	1		
Java:				
West Java—				
Batavia	Oct. 27-Nov. 2	1	3	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued.

Reports Received from December 29, 1923, to January 11, 1924—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Latvia				Oct. 1-31, 1923: Cases, 3.
Mexico:				
Vera Cruz	Nov. 3-9		1	
Poland				Oct. 1-31, 1923: Cases, 8.
Portugal:				
Lisbon	Nov. 11-Dec. 1	5	1	Nov. 19-Dec. 8, 1923: Cases, 7; deaths, 6.
Oporto	Nov. 25-Dec. 8	12	6	
Siam:				
Bangkok	Oct. 28-Nov. 10	19	12	
Siberia:				
Dauria Station	Oct. 21			Present. Locality on Chita Railway, Manchurian frontier.
Sierra Leone:				
Sherbro District—				
Tagbail	Nov. 1-15	3		
Spain:				
Barcelona	Nov. 15-21		1	
Valencia	Nov. 25-Dec. 8	62	4	
Syria:				
Aleppo	Nov. 25-Dec. 1	1		In vicinity, at Djisr Choughour.
Damascus	Nov. 16-22	1		
Switzerland:				
Berne	....do	2		
Tunis:				
Tunis	Oct. 27-Nov. 2	5	1	
Turkey:				
Constantinople	Nov. 11-17	2		
Union of South Africa:				
Cape Province	Oct. 28-Nov. 3			Outbreaks.
Natal	....do			Do.
Orange Free State	....do			Do.

TYPHUS FEVER.

Algeria:				
Algiers	Nov. 1-30	3	1	
Bolivia:				
La Paz	Oct. 1-Nov. 30	18	2	
Chile:				
Antofagasta	Dec. 2-8	4		
Talcahuano				Dec. 5, 1923: Three cases under treatment.
China:				
Antung	Nov. 12-18	1		
Egypt:				
Alexandria	Nov. 19-25	1		
Cairo	Sept. 10-23	2	3	
Latvia				Oct. 1-31, 1923: Cases, 12; paratyphus fever, 7; recurrent typhus, 3.
Poland				Sept. 23-Oct. 20, 1923: Cases, 133; deaths, 13.
Turkey:				
Constantinople	Nov. 11-Dec. 1	10		
Union of South Africa:				
Cape Province	Oct. 28-Nov. 3			Outbreaks.
Natal	....do			Do.
Durban	Nov. 24	72		Cases occurring among native stevedores in the harbor area of the port and confined to one barracks.
Transvaal	Oct. 28-Nov. 3			Outbreaks.
Johannesburg	Nov. 11-17	1		

YELLOW FEVER.

Brazil:				
Pernambuco City	Nov. 16	3	2	

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