PUBLIC HEALTH REPORTS

VOL. 35 AUGUST 27, 1920 No. 35

STUDIES OF RECONSTRUCTED MILK.[1]

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FOREWORD.

By EARLE B. PHELPS, Consultant, United States Public Health Service.

Pure milk contains a variety of substances, which, for convenience in analysis and reference, are conventionally divided into three groups: Fats, solids not fat, and water. The proportions of these three groups in the mixture vary with the breed of cattle, the feed, the season, and other variable conditions, but it will be sufficiently accurate for the present purposes and for illustration to say that normal milk contains 3½ per cent fats, 9 per cent solids not fat, and 87½ per cent water.

At a time when, in the interests of food conservation, the possibilities of desiccated foodstuffs are being developed and their economic advantages exploited, it is unnecessary to dwell at length upon the purely economic benefits which would accrue were it possible to deal with the milk supply of the country and, especially, with its problems of storage and transportation, upon a water-free basis.

Desiccation in general has two principal advantages: It reduces the weight of the commodity, thereby simplifying the problem of distribution; and it improves the handling and keeping qualities of perishable foods by doing away with the watery environment necessary for microbial activity. These advantages make it possible to distribute foodstuffs over wide geographical areas and thus to provide markets for those regions in which production is deficient or lacking. They also make possible a seasonal distribution or leveling, whereby the commodity may be carried over from a season of excessive production into a season of nonproduction.

To these manifest advantages, which are common in the entire field of desiccated food, there is added, in the case of milk supplies, a third of equal if not greater importance. This has reference to the sanitary aspects of the milk problem, which have so occupied the attention of public-health workers in recent years. Milk provides so favorable a medium for the growth and multiplication not only of normal and relatively harmless bacteria but also of the specific organisms of disease that the entire development of this important food supply,

[1] Made under the supervision of Earle B. Phelps, Consultant, United States Public Health Service.

especially as it relates to large cities, has been impeded and very seriously complicated by the necessary public-health restrictions. The storage and shipping of milk must be done at low temperature and can not extend beyond a few days at most, and pasteurization has come to be a recognized essential feature in the handling of a city milk supply.

If, now, it were possible to desiccate the product in its fresh condition by a process which would greatly reduce the existing bacterial life and prevent the further multiplication of the surviving organisms, the limitations referred to would in large measure disappear.

The actual realization of these conditions and the possibility of supplying to a community a milk reconstructed from its previously desiccated components and water, have been made possible by a series of steps, the commercial development of which has been taking place for many years. These are the mechanical separation of the fats in the form of cream from the skimmed milk, and modern processes of butter making; the development of processes, first, of skimmed milk evaporation, and, finally, of complete desiccation to a powder containing, in readily soluble form, all the milk solids except the fats; the development of mechanical means of emulsifying butter fat in water or skimmed milk solution, thus reconstructing the cream; and, finally, the conception of reconstructing a whole milk, by emulsifying butter fat into a solution of milk solids of proper strength.

This paper is a report of what is believed to be the first experiment upon a commercial scale with reconstructed milk. While the advantages of the plan, under many conditions, are so obvious that the idea had frequently been discussed, there were at the outset of this investigation certain difficulties to be overcome. In order to prevent fraud and protect health, it has been necessary for the States and the Federal Government to enact food laws which prohibit, in large measure, modification of natural food products. This raised the question of the propriety of the proposed procedure, which admittedly makes fraud, in the terms of the pure food law, easy and its detection difficult.

The particular situation which has been created by the possibilities of reconstructed milk is without precedent, and, as it deals with one of the most fundamental of the human foods, a most conservative attitude upon the part of the officials charged with the enforcement of the pure food laws has very properly been maintained. In view, however, of the tremendous advantages which are foreseen in the development of this field, it is believed that the problem must be handled entirely upon its own merits, and with the utmost frankness. There can be no question of the impropriety of handling reconstructed

milk, except under its own label and with complete information as to its source and method of preparation. If it can be shown, however, that reconstructed milk can be marketed in a community under cleaner and safer conditions and at less cost than can ordinary milk, the consumer is entitled to these advantages just as he is also entitled to know exactly what he is purchasing, and, if he prefers to use fresh cows' milk, to be assured that he receives that for which he asks and pays.

A second possibility which has prevented more active development of reconstructed milk has been the fear that the public might be slow to appreciate its advantages and reluctant to give up a part of the dietary so well established as milk in favor of what must appear to be a sort of manufactured product. While this argument will carry no weight whatever among physicians, dietitians, and others competent to look into the subject with sufficient thoroughness, it is a matter to be reckoned with most thoughtfully by one who would undertake the commercial development of a market for reconstructed milk.

In the situation which arose at the new Government city of Nitro, W. Va., both of these objections lost most of their force. A city to house some 25,000 people was being built overnight, and was without any visible milk supply, nor did it seem probable that a sufficient supply of safe milk could be obtained. The health administration of this city was to be in charge of the United States Public Health Service, so that there could be no question of conflict with traditional health regulations. The conditions made it unnecessary to fear competition with normal milk, so that it was practically assured in the beginning that, if the milk was satisfactory, a market would be secured. Under these favorable conditions a plan which had been gradually maturing was put into effect, and the present paper is a report of the results obtained. Unfortunately for this particular purpose, the experiment had to be discontinued before the complete data that were hoped for had been gathered. It is believed, however, that the results obtained are of so great importance that the outcome of this first commercial demonstration of the possibilities of reconstructed milk should be recorded.

Mr. Stevenson designed the plant and prepared the specifications for the mechanical equipment and has been wholly responsible for the planning and execution of the experimental work. He has been ably assisted throughout by Mr. Peck who was in resident charge during the construction period, and who, in the capacity of superintendent, was directly responsible for the operation of the station.

Mr. C. P. Rhynus made the bacteriological studies, and Mr. Leslie Z. Peck served as assistant superintendent.

I. THE MANUFACTURE AND HANDLING OF RECONSTRUCTED MILK AT NITRO, W. VA.

By ALBERT F. STEVENSON, Sanitary Engineer, and GEORGE C. PECK, Scientific Assistant, United States Public Health Service.

Introduction.

Nitro, W. Va., is located on the Kanawha River, about 13 miles from Charleston. It was built by the United States Government to house the laborers and mechanics employed in building the United States Explosives Plant C and later to house persons permanently employed in the smokeless-powder plant. Accommodations were made for about 25,000 inhabitants. The several institutions and industries necessary to form a well-organized community, such as schools, churches, hospitals, department stores, restaurants, water supply, sewerage, abundant food supply, etc., were provided. In short, a modern city was constructed on the land surrounding the explosives plant.

The construction of this city and the organization of the various necessary secondary industries was accompanied by many difficulties which were increased by war-time conditions. The gathering together of sufficient food of satisfactory quality proved to be one of the serious difficulties, and radical departures from current practice were made in order to overcome them. One of the most interesting and instructive divergencies was made in securing a sufficient quantity of fluid milk to satisfy the demand. The present article deals with this part of the work.

Available Normal Source of Milk.

Very little milk is produced in West Virginia in the vicinity of Nitro. The region is mountainous and little if any natural pasturage is available. In fact, previous to the building of the various Government industries located in this section, hardly enough local milk was available to supply the normal Charleston market. Up to the time Nitro was conceived, little attempt was made to increase the supply. Some milk was shipped in from the dairy section of Ohio, but with the advent of war, the scarcity of milk and the congestion of railroad traffic made this source undependable. The United States Public Health Service was called on to suggest some method of procuring a milk supply for Nitro.

Reconstructed Milk Products.

For some time it has been known that a liquid closely resembling milk and cream could be made by emulsifying butter fat obtained from unsalted butter in a solution of skimmed milk powder or diluted evaporated skimmed milk. This procedure has been very widely

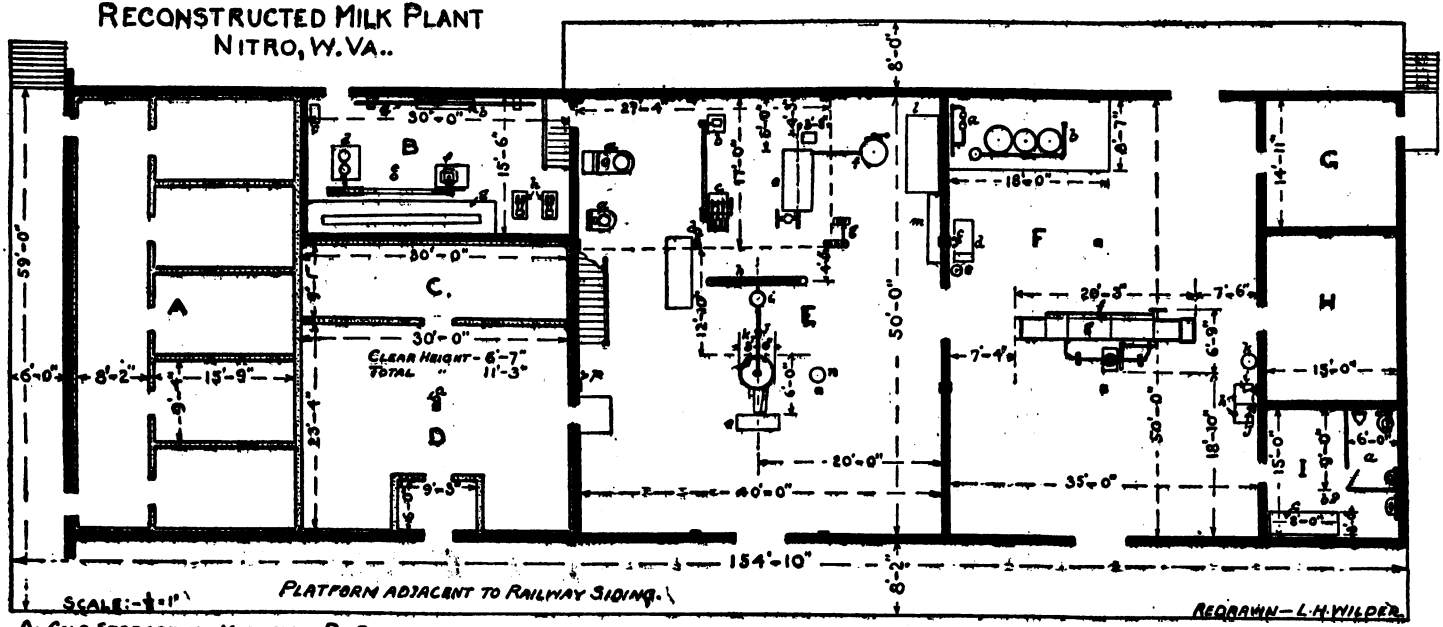
used by the ice-cream industry and has been sanctioned for this purpose by the pure-food officials. This liquid has also been made in small quantities at some Army field hospitals, and on several of the battleships to furnish a supply to the officers' mess. It has been made at various dairy and milk shows as a means of advertising milk powders.

The manufacture of reconstructed products on a small scale led to the assumption that a fairly large-scale plant could be successfully operated and the milk supply of a city the size of Nitro manufactured. After conferring with officials of the department of health and sanitation and the commissary department at Nitro, it was decided to recommend the building and equipping of a plant of sufficient capacity to supply the entire city with reconstructed milk and cream. It was certain that milk could be made which would be satisfactory if consumed within a few hours of the time of manufacture; but little, if anything, was known about the cost of manufacture, the method of handling, and the keeping qualities of the products.

In order to make a thorough investigation of the subject and at the same time supply Nitro with milk, the Public Health Service undertook to design the plant and superintend its operation as long as the process was in the experimental stage. An equipment was designed which, it was estimated, would handle 2,000 gallons of bottled milk in an eight-hour day, and which capacity could be increased to 3,000 gallons per day by the addition of another pasteurizing and emulsifying unit. Milk and cream could be handled in either bulk or bottled form, although equipment of sufficient size to bottle all the output was provided. It was expected that all milk sold, except that used for cooking, would be served in bottles.

Description of Building.

The "milk plant" was located in the south end of the reservation in a one-story frame building 150 feet long and 51 feet wide. This same building also housed a small cold-storage warehouse used by the commissary department for the storage of perishable foods. The space allotted to the manufacture of reconstructed milk was 123 feet long and 51 feet wide. This space was somewhat excessive, but on account of the experimental character of the work, extra room was provided. The general plan of the building is shown in Figures 1 and 2, and a sectional elevation in Figure 3. The building was divided into eight rooms: A milk manufacturing room; a room for the washing of containers; cold-storage space for milk and butter; a dressing room; a storage room for milk powder; an office; and a room for the refrigerating machinery.



A = COLD STORAGE FOR MEAT, ETC.. B = REFRIGERATION MACHINERY ROOM; a = CONDENSER COILS; b = AMMONIA TANK; C = TOOLS; d = ICE MACHINE; e = FLOOR DRAIN; f = MOTOR; g = BRINE TANK; h = BRINE PUMPS. C = BUTTER STORAGE. D = MILK STORAGE; a = FLOOR DRAIN; E = MILK ROOM; a a = ICE CREAM FREEZERS AND ICE CRUSHER; b = MOTOR; c = VISCOLIZER; d = STEAM AND WATER CONNECTION; e = SKIM MILK VAT; f = WEIGH CAN AND SCALES; g = MOTOR PUMP; h = COOLER; i = FOAM TANK; J = FLOOR DRAIN; k = CAN FILLER; l = WATER TANK; m = RACK FOR I.C. CANS; n = GARBAGE CAN; o = TABLE; p = STEAM AND WATER CONNECTION. F = WASH ROOM; a = STEAM METER; b = WATER STILL; C = STEAM AND WATER CONNECTION; d = WASH TANK FOR CANS; e = CAN RINSER AND STERILIZER; f = FLOOR DRAIN; g = BOTTLE WASHER; h = WASH TANK FOR BOTTLES; i = REVOLVING BRUSH FOR BOTTLES; J = STEAM AND WATER CONNECTIONS; k = GARBAGE CAN, G = OFFICE. H = STORE ROOM FOR MILK POWDER, ETC.. I = LABORATORY, a = LAVATORY; b = FLOOR DRAIN; C = TABLE.

MAIN FLOOR PLAN.

FIG. 1.

The milk room was 40 feet long and 50 feet wide. In the southwest corner was located a balcony, elevated 8½ feet from the main floor. This balcony was 27 feet long and 17 feet wide. An emergency exit from this room to the west platform was provided, but it was kept locked while the plant was in operation.

The washing room was 35 feet long and 50 feet wide. In the southwest corner of this room was located a platform 8 by 18 feet, raised about 6 inches from the main floor. It could be entered from both outside platforms.

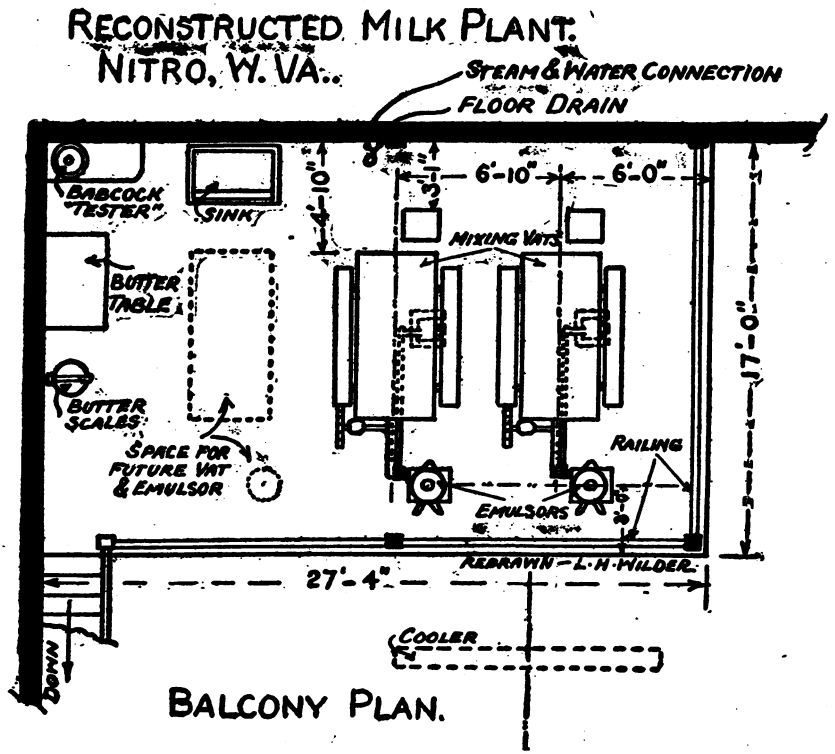
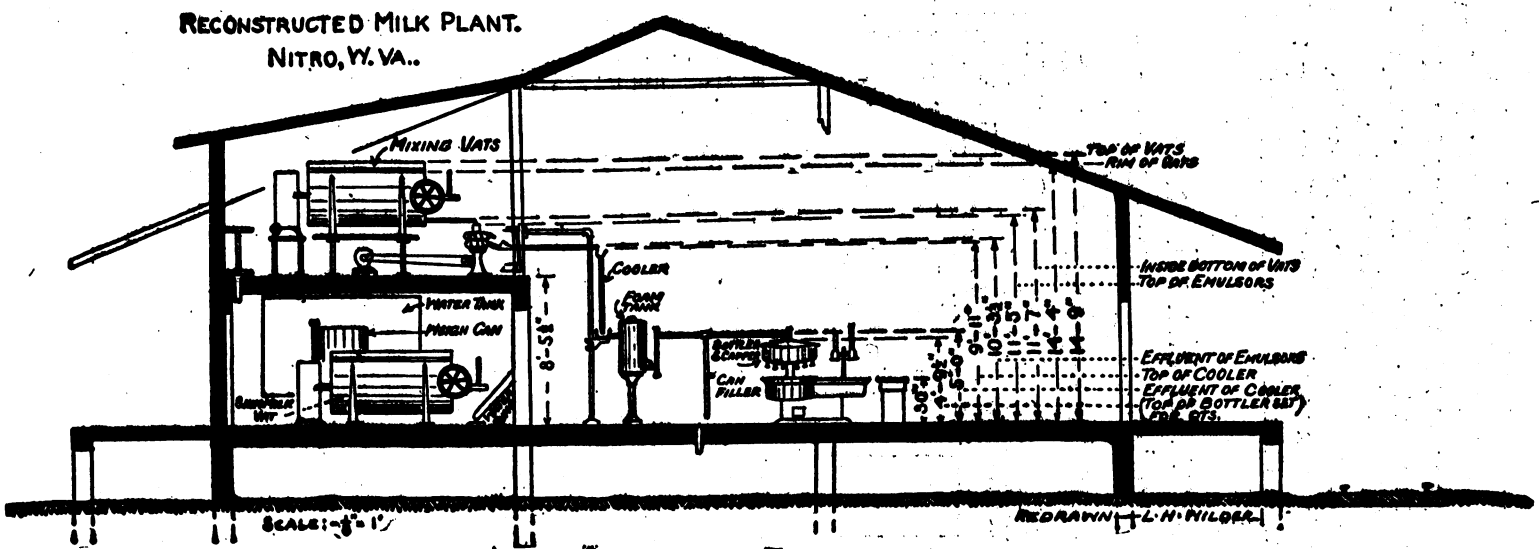


FIG. 2.

The refrigerator was 30 feet long by 23 feet wide. It could be entered from the milk-manufacturing room through a single refrigerator door, or from the east platform through two doors and a vestibule. The room was large enough to store one day's output of the plant, together with a carload of ice.

The butter-storage room was 30 feet long by 9 feet wide. It could be entered only from the milk-storage room. This room was large enough to store two carloads of butter. Both of the cold-storage rooms were insulated with rock cork and were plastered inside with cement plaster. They had an available head room of 6 feet 7 inches.



SECTIONAL ELEVATION.

FIG. 8.

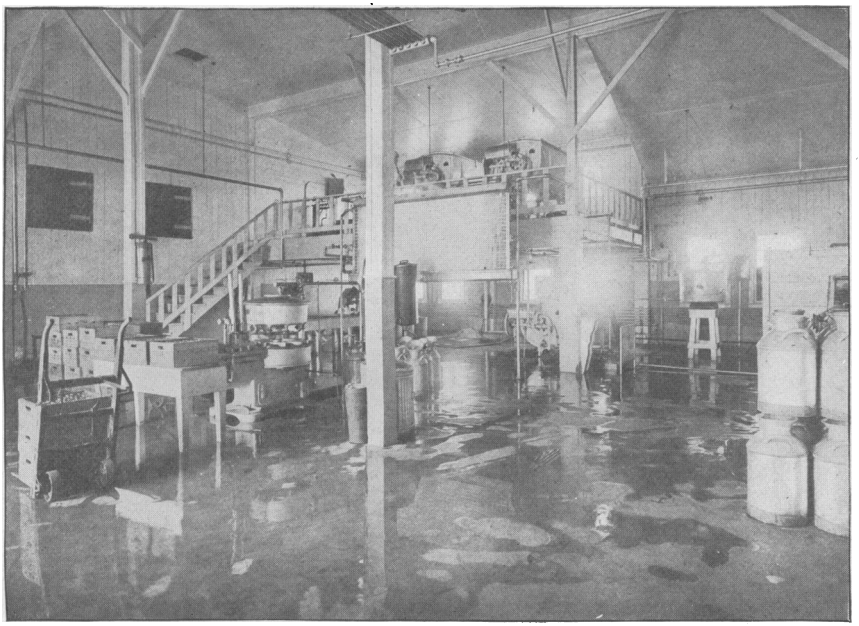


Fig. 4.—Manufacturing and bottling room, Reconstructed Milk Plant, Nitro, W. Va.

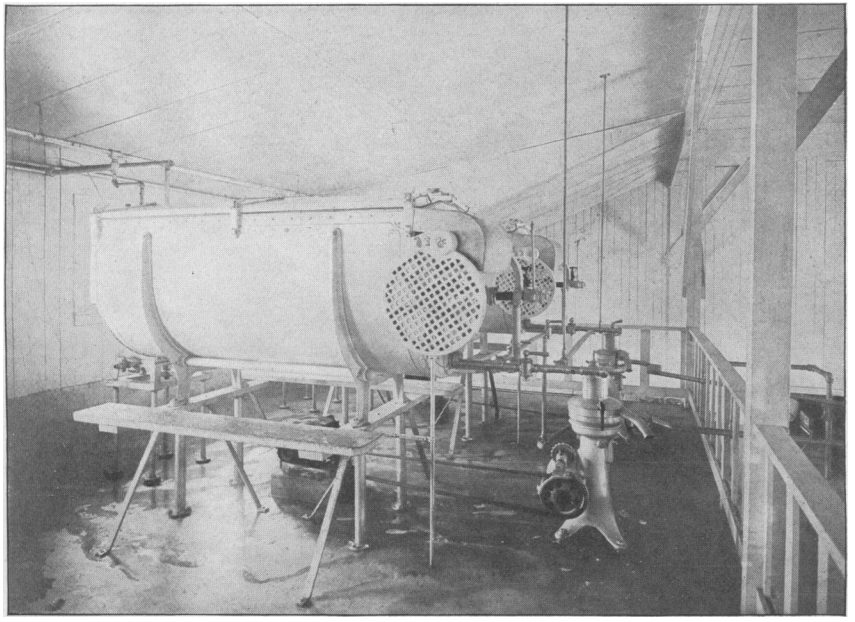


Fig. 5.—Mixing vats and emulsors, Reconstructed Milk Plant, Nitro, W. Va.

The dressing room was approximately 15 feet square, and could be entered from the wash room. It contained hand bowls and toilets and lockers for clothing.

The room for the storage of milk powder, which was 20 feet by 16 feet, was of sufficient size to store 100 barrels.

The office was 16 feet square and contained a desk, chairs, a table, and a telephone. The office could be entered from the outside and also from the washing room. This outside entrance was the only entrance used by those not employed at the plant.

The room containing the refrigerating machinery was 30 feet long by 15½ feet wide. The floor of this room was at the ground elevation and could be reached by a short stairway leading from the milk room.

The main floor of the building was made of heavily reinforced concrete, and was elevated about 5 feet above the ground level. It extended 8 feet beyond the walls of the building on either side, forming concrete receiving and shipping platforms. All rooms, with the exception of the office and the milk-powder storage room, were supplied with floor drains connected to the sewer.

The inside finish of the rooms consisted of a 5-foot wainscoting of cement plaster over metal lathing extending around the base of the walls. Above this wainscoting the walls were finished with matched siding. Plaster board was nailed to the rafters to within 10 feet of the peak of the roof. At this point the plaster boarding was carried across to the opposite rafters, forming a horizontal ceiling with an air chamber above. The wainscoting was tinted a dark blue-gray, and the walls and ceiling were painted with white enamel over flat white. The inside of the refrigerators was painted with white enamel over flat white. This color scheme proved to be practical and very pleasing in appearance.

The milk room and wash room were ventilated by means of five ventilators operated by natural draft. These ventilators extended through the roof into the air chamber, which, in turn, was provided with openings located directly under the ventilators.

EQUIPMENT.

On account of the experimental nature of the plant, the equipment was purchased with the idea of acquiring units which could be rearranged at will, until a satisfactory layout was obtained. The milk-handling machinery, located in the milk room, consisted of a buttermilk machine of 300 gallons capacity; a milk pump; two 300 gallon ice-cream batch mixers; two centrifugal emulsors of 200 gallons capacity each, belt-driven from 2-horsepower motors; one tubular milk cooler of 5,000 pounds per hour capacity, composed of two sections, one for water and one for brine; an antifoam tank; a rotary bottle filler and capper; scales and tank for weighing water, and scales for weighing butter; a porcelain topped table for cutting butter; and a

Babcock tester. The locations of these machines are given in Figures 1 and 2. All of this machinery, except the mixing and pasteurizing vats, emulsors, butter scales, and butter-cutting table, was located on the main floor. These machines were on the balcony, as shown in Figures 2, 3, and 4.

As it was necessary to start the construction of the building before all of the machinery had been selected, it was not possible to determine the headroom necessary to insure a gravity system from the mixing vats to the bottle filler. It was found necessary, therefore, to elevate the mixing vats about 2 feet above the floor of the balcony. They were supported on a stand made of 2-inch pipe. This arrangement made speed in operation difficult and should be avoided. Figure 3 gives the elevation necessary for a gravity system.

All machines were connected with 1½-inch sanitary milk piping, and the valves and fittings were of the easily cleanable sanitary type. A no-foam can filler was installed between the antifoam tank and the bottle filler. All machines were driven by individual motors, thus doing away with the inconvenience of overhead shafting. The plant as designed was not equipped to manufacture ice cream, but when operations were started it was found necessary to manufacture a small amount of this product each day. A 60-quart continuous brine freezer was purchased but was never operated. In order to tide over until this machine was available for use, two of the old type can freezers were set up and operated. They were motor driven and were located under the balcony against the wall of the machinery room.

Bottles were washed with an automatic jet washer, having a capacity of approximately 4,000 bottles an hour. The pumps of this machine were operated by a direct-connected 10-horsepower motor. This washer was located in the center of the washing room and was oriented so that the bottles coming from the machine could be trucked directly into the milk room and stored. A small galvanized-iron tank used for the washing of cans, which process was carried out by hand, together with a rinser and steamer, was located against the south wall of the washing room, as shown in Figure 1. A small brush washer, on which extremely dirty bottles could be scrubbed, was located on the north wall of the washing room. A two-effect water still with a capacity of 350 gallons per hour was located on the raised platform in the southwest corner of the washing room. The effluent pipe from this still projected through the wall into the milk room and discharged into a tin-lined distilled-water storage tank of 1,000 gallons capacity. This storage tank was connected by tinned-covered piping to the suction end of the milk pump. At this point a three-way valve was located, so that fluid could be drawn from either the distilled water tank or the buttermilk machine as desired.

The discharge from this pump was also arranged so that the effluent could be sent either into a weighing can mounted on a small platform near the skimmed-milk vat, or to the mixing vats on the balcony.

A small field laboratory for determining the bacteriological content of milk and milk products as well as the acidity and fat in milk, was located in the dressing-room. This laboratory will be described in the section on the analytical study of reconstructed milk products. A Babcock centrifuge was located on a stand on the balcony in the milk room, where frequent tests of the finished product could be conveniently made.

The refrigeration used for both the reconstructed milk plant and the cold-storage department of the commissary was furnished by a 15-ton refrigerating machine. The ammonia compressor was driven by a 30-horsepower motor. All of the refrigerator rooms were cooled directly by the expansion of the compressed ammonia. Brine, cooled by the expansion of ammonia, was used for cooling the reconstructed milk. The brine was circulated by a steam-driven brine pump.

WATER SUPPLY.

The water used throughout the plant was obtained from the regular Nitro supply, which had previously been filtered and chlorinated. This water, brought into the building through a 3-inch main, was used only for cleaning and cooling purposes.

STEAM SUPPLY

The steam used in the plant was generated in a central power plant located about 600 feet from the milk plant. It was brought to the plant by a 4-inch steam main.

Plant Operation.

RECONSTRUCTED MILK PRODUCTS DEFINED

As has been stated, reconstructed milk products are products made by the emulsification of butter fat in normal or reconstructed skimmed milk. Reconstructed skimmed milk may be made either by diluting unsweetened condensed or evaporated skimmed milk with distilled water or by dissolving dried skimmed milk powder in distilled water. The percentage of fat and solids not fat may be adjusted to suit the use which is to be made of the product, provided these percentages are plainly stated on the package. In the work described below skimmed milk powder was used exclusively as a source of solids not fat, and a high grade of unsalted butter as a source of butter fat. Reconstructed milk, reconstructed cream, ice-cream, and fermented milk products, such as cultured buttermilk and cottage cheese, were all manufactured.

INGREDIENTS.

In the reconstruction of milk it should be borne in mind that no matter foreign to normal cow's milk should be added to the product. It is necessary, therefore, to use only the purest water, and the highest grade of dried skimmed milk and butter. The finished product can grade no higher than the ingredients used. The extreme importance of this point justifies a detailed discussion of each ingredient.

Water.—Nothing but the very purest of water, from both a chemical and bacteriological standpoint, should be used in the reconstruction of milk. Assuming that a normal water supply is available, which is free from all harmful bacteria, this water may contain mineral salts which might possibly be harmful to the weak digestion of an infant. For example, the hard waters of the Middle West and those containing a high percentage of sulphate could very easily cause intestinal disturbances in the young. Also, from the manufacturing standpoint, these salts would very probably have a deleterious effect on the physical state of the emulsion. It is very probable that, in some districts, a very pure water, free from mineral constituents and free from all pollution might possibly be obtained, but this condition is so rare that only distilled water should be considered as a general source.

From a bacterial standpoint, water that is not absolutely free from pollution would be much more dangerous when used in milk than when used as water, for the growth of the harmful bacteria could easily take place in the excellent food medium which is furnished, and a very small number of pathogenic organisms gives rise to a number sufficient to be harmful. As the best of our filtered supplies may contain a small number of disease-producing organisms, practically all waters except those which have been freshly distilled are eliminated. It is, therefore, strongly recommended that no reconstructed milk products be manufactured without using water which is free from dissolved salts and pathogenic bacteria.

From a commercial standpoint it is highly important that the water used in the manufacture of milk products should be free from objectionable tastes, odors, sediment, and color. Even the characteristic flavor of poorly made distilled water may be easily distinguished after the milk powder and butter have been added. This flavor also increases with the age of the milk and is decidedly objectionable in a product 24 to 48 hours old. In selecting a still for the manufacture of distilled water great importance should be placed on the ability of this still to produce a tasteless and odorless product.

Skimmed milk powder.—The skimmed milk powders available on the market to-day may be divided into three classes: Those made by drying on rolls at atmospheric pressure and a relatively high tempera-

ture; those made by drying under reduced pressure and a correspondingly lower temperature; and those made by drying a finely atomized milk in a current of hot, dry air. The manufacturers of powder made by the various processes claim advantages over powders made by other processes, and the purchaser must decide on the product best suited to his needs.

In the manufacture of reconstructed milk, the following points are of extreme importance in the selection of a skimmed-milk powder:

The powder should be wholly and easily soluble in water and when reconstructed should give a solution with the characteristic flavor of normal skimmed milk.

The various constituents, such as the sugar, proteins, and mineral salts, should not have been altered during drying, and upon reconstruction should appear in as near the original state as possible. A solution of the powder should have the power to hold an emulsion of butter fat similar to that found in normal milk.

As the reconstructed milk must meet all the legal requirements of normal market milk, the original milk used for drying must be produced in a cleanly fashion, and must meet all requirements of the local health department of the district where the reconstructed milk is to be sold. The process of drying should also be conducted in a cleanly manner, and rules prescribed for the handling of normal milk should be enforced in the manufacture of the skimmed-milk powder. It is needless to say that this powder should contain only and all the ingredients occurring in normal skimmed milk, with the exception of the water. Skimmed-milk powder is deliquescent and absorbs moisture rapidly. If the moisture content is high, the powder will lump in the containers and be unfit for use. It should therefore be stored in moisture-proof containers and should be sold with a guaranteed maximum moisture content.

Butter fat.—Sweet or unsalted butter is used as a source of butter fat. A good quality of sweet butter is almost as difficult to obtain as a good quality of skimmed milk powder or water. It should have good flavor, be free from pathogenic organisms, and be manufactured in such a manner that objectionable flavors and odors will not be produced in it during storage. It should never be artificially colored, and manufacturers should guarantee the butter-fat content. The butter should be shipped in proper containers, and every container should be scored by the purchaser before it is accepted. Butter should be stored at a temperature sufficiently low to prevent the production of disagreeable flavors and odors and should be taken out of storage only as needed.

Commercial Manufacture of Reconstructed Milk.

RECONSTRUCTION OF SKIMMED MILK.

If the skimmed milk powder to be used has been selected with proper care, the process of dissolving it is not a difficult one. At Nitro a vat buttermilk machine of ordinary design was used for this

purpose. This machine was of 300 gallons capacity and was equipped with a revolving heating coil to which blades were attached, serving simultaneously as agitator and heater. In selecting a vat, care should be taken to obtain one with a cylindrical bottom, and sides which are tangential to the surface of the cylinder. There should be no corners in which the undissolved powder may be pocketed. The necessary amount of distilled water should be placed in the vat and a weighed amount of skimmed milk powder added. The powder may be dumped in directly from the barrel, if care is taken to prevent foreign matter from falling from the sides of the barrel during the process. It was found that better results were obtained when the powder was removed from the barrel with a large sugar scoop. The coil agitator should be in operation while the powder is being added. The temperature of the water during the period of solution of the powder should be between 70° and 80° F.

Adding butter, and pasteurization.—After the complete solution of the powder had taken place, the skimmed milk was pumped to one of the mixing vats on the balcony. Here the necessary amount of butter, which had previously been cut into 4-inch cubes on the porcelain topped table provided for the purpose, was added, and the mixture brought to a temperature of 146° F., and held there for 30 minutes. It was found that by the time the temperature had reached 146° F. all the butter had melted. The holding time for the pasteurization of the skimmed-milk-butter mixture may therefore begin when the correct temperature is reached. It is necessary, however, to cut the butter into 4-inch cubes or less if this procedure is to be followed.

Emulsifying the butterfat.—After the mixture had been pasteurized, and while it was at the pasteurizing temperature, it was passed through the centrifugal emulsors.

Emulsification is brought about by the forcing of the mixture of butter and skimmed milk through an extremely narrow opening, using centrifugal force generated by revolving the bowl of the emulsor at a speed of approximately 15,000 revolutions per minute.

Cooling.—From the emulsors the hot reconstructed milk was conducted to the upper trough of the cooler through sections of 1½-inch sanitary milk pipe to which had been attached small conductor heads. The milk from the emulsors contained a great deal of foam, and difficulty was experienced in transmitting this foaming product to the cooler. A large bank of foam collected where the milk entered the conductor head and also in the upper trough of the cooler. This necessitated the providing of ample capacity at both of these points to prevent the foam from accumulating and running over the edge of the conductor head and trough. For this reason it is felt that the use of an external cooler should be avoided in this process. The use

of an external tubular cooler would eliminate to a great extent this waste and inconvenience. By inserting an antifoam tank, as described below, between the emulsor and the cooler, much of this trouble might be eliminated. This arrangement was not tried at Nitro, however.

A proper regulation of the temperature of the milk as it leaves the cooler is an important point in the process of manufacture. As with ordinary milk, freezing throws the butterfat out of emulsion to a greater or less degreee. The flow of brine should therefore be regulated so that a minimum amount of milk freezes to the cooler. All milk which does so freeze should be re-emulsified before bottling. Satisfactory results can be obtained if the milk leaves the cooler at a temperature of from 40° to 50° F.

Foam removal.—As has been stated, the reconstructed milk as it leaves the emulsor contains a great deal of suspended air. This air is in such a finely divided state that it is eliminated slowly. Bottles filled with the milk directly from the cooler show, on two hours standing, an air space between the cap and the surface of the milk varying from 1 inch to 3 inches in height. In order to eliminate this foam an antifoam tank was inserted between the cooler and the can and bottle fillers. This foam tank is simply a detention tank, from the bottom of which the milk is drawn. A sketch of it is shown in Figure 6. With the emulsors running at full capacity (approximately 400 gallons per hour) this tank gave a detention time of approximately 3¼ minutes. This arrangement eliminated practically all the foam from the milk.

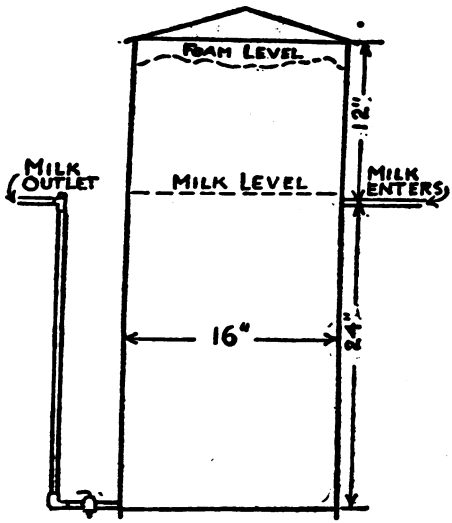


FIG. 6.—Section of antifoam tank used at the Reconstructed Milk Plant, Nitro, W. Va.

Filling containers.—From the foam tank the milk passed into a rotary bottle filler. A "no foam" can filler was inserted between the antifoam tank and the bottler. At this point all the cans were filled. The bottle filler was driven by a direct-connected motor and had a capacity sufficient to handle the effluent from the emulsors. This type of filler and capper has a decided advantage over a case filler in that all bottles have to be handled twice and therefore get two inspections. When using the case filler there is a great tendency to slight the bottle inspection, and many damaged bottles which

should not be used are filled and put into circulation. The bottles used were of the ordinary glass, common-sense type, capped with paper caps. As is customary, the caps bore the package label.

Storage.—Immediately after the containers were filled they were trucked into the cold-storage room, where they remained until delivered. The temperature of this room was approximately 33° F.

Labeling.—Regulations pertaining to all foodstuffs should be applied to reconstructed milk products. These products should be sold only for what they are and only when the packages are properly labeled. According to the present law, a milk made from skimmed milk powder, water, and butter is not "milk," and should not be sold as such. The law distinctly states that milk is the normal fluid secreted by the mammary glands of the cow, and a product which has been reconstructed certainly can not be classed as "milk."

In choosing a name for this product various titles have been considered. From the list has been chosen the term "reconstructed milk." It is felt that this is fully descriptive and leaves no reason

FIG. 7.—Bottle caps used at the Reconstructed Milk Plant, Nitro, W. Va.

for doubt as to the product. The word "reconstructed" may possibly arouse some sense of fear in the minds of the unenlightened consumer, for it may signify to him a product which has been at some time in an unsatisfactory condition and later renovated. Various other names which have been suggested are "remade," "emulsified," "reconstituted," "recombined," and "rehydrated." Any of these terms may be used, subject to the approval of the officials who are intrusted with the enforcement of the pure-food laws.

In labeling any of these manufactured products the word "reconstructed," or any other similar word which may be used, should be given as much prominence as the word "milk." The label should also set forth the percentage of butter fat and the percentage of milk solids not fat which the product contains. Figure 7 shows samples of the various caps used at Nitro. The reconstructed milk manufactured there contained 9 per cent milk solids not fat and 3½ per cent butter fat. The cream contained 25 per cent butter fat. A form of fermented milk similar to buttermilk was manufactured and styled

"Nitrolac." It was not considered proper to label this milk buttermilk, for the term "buttermilk" has a distinct meaning. It is a product of the churning of milk or cream and the name should be used for no other product. The fermented milk used at Nitro was simply a cultured milk of a low percentage butter fat.

Washing containers.—All containers were washed in the room provided for that purpose. The bottles were inverted and washed in the cases. The washer used consisted of a series of tanks from which water or alkali solutions were pumped with considerable pressure through a series of jets. The cases were intermittently advanced by a mechanical device and the jets so arranged that during the resting period a powerful stream of water or chemical solution was injected into each bottle while a number of streams were forced against the outside and inside of the case. The temperature of the first rinse water was approximately 110° F., a temperature sufficient to warm the cold bottle without danger of breaking it. The temperatures of the subsequent washing and rinsing solutions were so regulated that the final temperature of the bottle was approximately that of boiling water. Before leaving the machine each bottle was subjected to a jet of live steam which acted as the final sterilizing agent.

All cans and metal containers were washed by hand in a galvanized iron tub provided for the purpose. After a thorough brushing with an alkali solution, the can and cover were inverted over a can rinser and sterilizer where they received a hot-water rinse and a thorough steaming.

Cleaning milk-handling machinery.—At the end of each day's run all milk-handling machinery and piping were completely disassembled, rinsed with warm water, scrubbed with a brush and hot alkali solution, rinsed with hot water, and then sterilized by blowing live steam into or through them for a considerable time. The machinery was then partially assembled. In the morning before operations commenced, the machinery was completely assembled and connected at various points to the steam line. Steam was blown through the assembled machinery for approximately 20 minutes. This produced a satisfactory sterilization.

The most difficult piece of machinery to sterilize was the tubular cooler. This is the general experience where this type of cooler is used. At the end of the run the tubes are full of water or brine, and the ordinary methods of steaming are not sufficient to heat the whole mass up to the sterilizing point. Satisfactory sterilization may be accomplished by emptying the tubes and either blowing steam, under pressure, through them, or by inserting a steam hose between the covers and the cooler and allowing steam to blow in for some time. If either of these methods is used, a by-pass around the brine pump must be supplied so as to drain the brine coil back to the tank without

wasting the brine. These methods of sterilization are very likely to cause leaks in the cooler, owing to the uneven expansion of the coils. It was found at Nitro that satisfactory sterilization could be accomplished by a thorough brushing with soda solution and then rinsing with approximately 200 gallons of water which had been previously heated to about 180° F. in one of the pasteurizing vats. From a bacteriological standpoint this method is not as efficient as draining the coils and applying steam.

QUANTITY OF THE RECONSTRUCTED PRODUCTS MANUFACTURED.

As has been stated, the plant had a capacity of at least 2,000 gallons of reconstructed products in an eight-hour day. This amount of milk was never sold in Nitro, owing to the impossibility of proper delivery. Nitro was never completely finished, and the streets, up to the cessation of operations, were in such poor condition that a house-to-house delivery could not be made. It was intended to substitute for this retail delivery a wholesale delivery to a number of small distributing stations centrally located, where the various milk products could be purchased by the consumer and carried to the homes. This system would have had the advantage of eliminating bottle loss. Unfortunately, these milk stations were not finished in time to take care of the rush. The fact that milk could be purchased only at the general stores cut the consumption greatly.

Table I gives the daily quantities of the various products manufactured during the months of September, October, November, and December, 1918, and part of January, 1919.

TABLE I.—*Quantity of reconstructed milk products manufactured daily at Nitro, W. Va., during September, October, November, and December, 1918, and part of January, 1919.*

Date.	Pounds of milk.	Pounds of cream (25 per cent).	Pounds of ice cream mix.	Gallons of ice cream.
1918.				
Sept. 6	1,094			
7		100		
9	1,799			
10	2,200			
11	3,000			
12	3,500			
13	3,400			
14	4,400			
15	2,200			
16	6,400			
17	5,400			
18	4,000			
19	7,200	500		
20	4,800			
21	2,400			8
22	4,400			19
23	4,800	1,000		10
24	7,200			18
25	4,800			10
26	7,200			
27	7,200			
28	6,300			
29	7,200			10
30	9,600		1,200	25

TABLE I.—*Quantity of reconstructed milk products manufactured daily at Nitro, W. Va., during September, October, November, and December, 1918, and part of January, 1919*—Continued.

Date.	Pounds of milk.	Pounds of cream (25 per cent).	Pounds of ice cream mix.	Gallons of ice cream.
1918.				
Oct. 1	7,200			125
2				50
3	7,200	600	1,200	55
4	7,200		1,210	115
5	7,200			145
6	7,200			130
7	7,200		1,200	125
8	7,200			95
9	7,200			85
10	7,200	500	1,200	75
11	7,200			135
12	7,200		1,200	65
13	7,200	500		110
14	7,200			125
15	7,200		1,200	115
16	7,200	500		110
17	7,200		1,200	145
18	8,400			75
19	7,200			85
20	7,200		1,200	125
21	8,400	500		90
22	8,400			65
23	8,400		1,200	110
24	8,400	500		90
25	9,600		1,200	110
26	8,400			40
27	8,400		600	120
28	9,600	500		150
29	9,600	500		35
30	7,200			
31	8,400			
Nov. 1	7,200			
2	7,200			
3	8,400			80
4	8,400	500		85
5	7,200		600	40
6	8,400			40
7	8,400			
8	7,200		600	100
9	12,000			155
11	9,600		1,200	30
12	8,400	500		
13	7,200			75
16	12,000		1,200	75
17	4,800			75
18	4,800	500		105
19	7,200			25
20	4,800		1,200	20
21	4,800	500		95
22	7,200			75
23	4,800			30
24	4,800			20
25	2,400			60
26	4,800		1,200	60
27	4,800	500		70
28	4,800			30
29	4,800			60
30	4,800		1,200	50
Dec. 1	4,800			
2	2,400	500		70
3	4,800		1,200	70
4	2,400			65
5	2,400			65
6	4,800			35
7	2,400	500		150
9	7,200		1,200	75
10	2,400			55
11	2,400			40
12	4,800			60
13	4,800	500		45
14	4,800			35
15				15
16	2,400			45
17	2,400	500		65
18	2,400		1,200	60
19	4,800		1,200	65

TABLE I.—*Quantity of reconstructed milk products manufactured daily at Nitro, W. Va., during September, October, November, and December, 1918, and part of January, 1919*—Continued.

Date.	Pounds of milk.	Pounds of cream (25 per cent).	Pounds of ice cream mix.	Gallons of ice cream.
1918.				
Dec. 20	4,800			60
21	2,400			45
23	2,400	500		80
24	2,400		1,200	60
26	2,400			45
27	2,400	500		50
28	2,400			45
30	2,400		1,200	55
31	2,400			30
1919.				
Jan. 1	2,400	1,000		60
3	2,400		600	60
4	2,400	500		
5				35
6	2,400			30
7	2,400			45
8	2,400		1,200	80
9				50
10	2,400	500		45
11	4,800			40
12				65
13		500	1,200	80
14	2,400			60
15	2,400			85
16				40

The quantities of milk and cream produced are large enough to serve as a basis for economic considerations.

OPERATING SCHEDULE.

It was expected that full data on the cost of operation of this plant could be collected by keeping accurate labor charts and metering the electric power, the water, and the steam consumed by each machine. Unfortunately the meters were lost in transit, due to congested traffic conditions, and this part of the data is not available. Time sheets of the various operations were kept, and the operating schedule given below was computed from them.

The capacity of the plant depends on the time required to mix the ingredients and pasteurize them. It is therefore of first importance to determine the time required for the various operations connected with this part of the process. Accurate time sheets were kept for two months, and it was found that the following time intervals were required to perform the various operations included in the mixing, pasteurizing, and emulsifying of one batch, 282 gallons, of milk:

	Minutes.
Weighing and transferring water and skimmed milk powder to vat	33
Dissolving powder	10
Emptying skimmed milk vat	16
Preparing and adding butter	13
Heating mixture to 146° F	28
Holding for pasteurization	30
Emulsifying (2 emulsors in use)	45

Using these data, a daily schedule of operation of the three vats and two emulsors was planned. This schedule is given in Table II. Vats A and B represent the mixing and pasteurizing vats on the balcony, and vat S is the skimmed milk vat located on the main floor.

It will be noted from Table II that vat S is in continuous operation, but that vats A and B are idle 20 minutes, and the emulsors 15 minutes, between every two batches. This loss of time could be eliminated by changing the method of preparing the skimmed milk. Too much time is consumed in measuring and handling the water and powder. This time can be reduced by arranging the building so that the powder storage room and the distilled water storage tank are on the same level with the present balcony. A weighed charge of powder could then be dumped directly into a hopper placed above the skimmed milk vat while the powder in the previous batch is dissolving. If, at the same time, water from the elevated tank could be run directly into the mixing vat through a 4-inch conductor, the time of charging the vat could be reduced to approximately 10 minutes. An ordinary gauge glass attached to the end of the vat, extending the full height of the vat, could be calibrated accurately enough to provide means of measuring the distilled water. By using this arrangement of measuring devices and by having the man responsible for the mixing of the skimmed milk commence work an hour ahead of the rest of the force, the output of the plant can be increased from six to eight batches per day. Such an arrangement is outlined in Table III.

It will be noted that between Batches II and III, IV and V, and VI and VII there are 12-minute intervals during which no milk is passing through the emulsors. These delays are unavoidable when vats of this capacity are used.

TABLE II.—*Schedule of manufacturing milk at Nitro, W. Va.*

Vat S.	Vat A.	Vat B.
8 a. m. + 33 minutes to measure ingredients Batch I. 8.33 a. m. + 10 minutes to dissolve powder. 8.43 a. m. + 16 minutes to empty vat. 8.59 a. m., vat empty. 9 a. m. + 33 minutes to measure ingredients Batch II. 9.33 a. m. + 10 minutes to dissolve powder. 9.43 a. m. + 16 minutes to empty vat. 9.59 a. m., vat empty. 10 a. m. + 33 minutes to measure ingredients Batch III. 10.33 a. m. + 10 minutes dissolving powder. 10.43 a. m. + 16 minutes emptying vat. 10.59 a. m., vat empty. 11 a. m. + 33 minutes to measure ingredients Batch IV. 11.33 a. m. + 10 minutes dissolving powder. 11.43 a. m. + 16 minutes emptying vat. 11.59 a. m., vat empty. 12. m. + 33 minutes to measure ingredients Batch V. 12.33 p. m. + 10 minutes to dissolve powder. 12.43 p. m. + 16 minutes emptying vat. 12.59 p. m., vat empty. 1 p. m. + 33 minutes to measure ingredients Batch VI. 1.33 p. m. + 10 minutes dissolving powder. 1.43 p. m. + 16 minutes emptying vat. 1.59 p. m., vat empty.	8.47 a. m. + 13 minutes to prepare and add butter to Batch I. 9 a. m. + 11 min. heating to 146° F. 9.11 a. m. + 30 minutes "holding." 9.41 a. m. + 45 minutes to emulsifying Batch I. 10.26 a. m., Batch I finished. 10.46 a. m. + 13 minutes to prepare and add butter Batch II. 10.59 a. m. + 11 minutes heating to 146° F. 11.10 a. m. + 30 minutes "holding." 11.40 a. m. + 45 minutes emulsifying. 12.25 p. m., Batch III finished. 12.46 p. m. + 13 minutes to prepare and add butter to Batch V. 12.59 p. m. + 11 minutes heating to 146° F. 1.10 p. m. + 30 minutes "holding." 1.40 p. m. + 45 minutes emulsifying. 2.25 p. m. Batch V finished.	9.47 a. m. + 13 minutes, prepare and add butter Batch II. 10 a. m. + 11 minutes, heat to 146° F. 10.11 a. m. + 30 minutes, "holding." 10.41 a. m. + 45 minutes emulsifying. 11.26 a. m., Batch II finished. 11.46 a. m. + 13 minutes, prepare and add butter Batch IV. 11.59 a. m. + 11 minutes, heat to 146° F. 12.10 p. m. + 30 minutes "holding." 12.40 p. m. + 45 minutes emulsifying. 1.25 p. m. Batch IV finished. 1.46 p. m. + 13 minutes prepare, and add butter Batch VI. 1.59 p. m. + 11 minutes, heating to 146° F. 2.10 p. m. + 30 minutes "holding." 2.40 p. m. + 45 minutes emulsifying. 3.25 p. m. Batch VI finished.

TABLE III.—*Proposed schedule using new arrangement of building.*

Vat S.	Vat A.	Vat B.
Batch I.	*Batch I.*	*Batch II.*
7.38 a. m.+12 minutes, measuring powder and water. 7.50 a. m.+10 minutes, to dissolve powder. 8.00 a. m.+16 minutes, emptying vat. 8.16 a. m., vat empty.	8.00 a. m.+16 minutes, preparing and adding butter. 8.16 a. m.+11 minutes, heating to 146° F. 8.27 a. m.+30 minutes, holding at 146° F. 8.57 a. m.+45 minutes, emulsifying. 9.42 a. m., Batch I completed.	8.45 a. m.+16 minutes, preparing and adding butter. 9.01 a. m.+11 minutes, heating to 146° F. 9.12 a. m.+30 minutes, holding at 146° F. 9.42 a. m.+45 minutes, emulsifying. 10.27 a. m., Batch II completed.
Batch II.	*Batch III.*	*Batch IV.*
8.23 a. m.+12 minutes, measuring powder and water. 8.35 a. m.+10 minutes, dissolving powder. 8.45 a. m.+16 minutes, emptying vat. 9.01 a. m., vat empty.	9.42 a. m.+16 minutes, preparing and adding butter. 9.58 a. m.+11 minutes, heating to 146° F. 10.09 a. m.+30 minutes, holding at 146° F. 10.39 a. m.+45 minutes, emulsifying. 11.24 a. m., Batch III completed.	10.27 a. m.+16 minutes, preparing and adding butter. 10.43 a. m.+11 minutes, heating to 146° F. 10.54 a. m.+30 minutes, holding at 146° F. 11.24 a. m.+45 minutes, emulsifying. 12.09 p. m., Batch IV completed.
Batch III.	*Batch V.*	*Batch VI.*
9.20 a. m.+12 minutes, measuring powder and water. 9.32 a. m.+10 minutes, dissolving powder. 9.42 a. m.+16 minutes, emptying vat. 9.58 a. m., vat empty.	11.24 a. m.+16 minutes, preparing and adding butter. 11.40 a. m.+11 minutes, heating to 146° F. 11.51 a. m.+30 minutes, holding at 146° F. 12.21 p. m.+45 minutes, emulsifying. 1.06 p. m., Batch V completed.	12.09 p. m.+16 minutes, preparing and adding butter. 12.25 p. m.+11 minutes, heating to 146° F. 12.36 p. m.+30 minutes, holding at 146° F. 1.06 p. m.+45 minutes, emulsifying. 1.51 p. m., Batch VI completed.
Batch IV.	*Batch VII.*	*Batch VIII.*
10.05 a. m.+12 minutes, measuring powder and water. 10.17 a. m.+10 minutes, dissolving powder. 10.27 a. m.+16 minutes, emptying vat. 10.43 a. m., vat empty.	1.06 p. m.+16 minutes, preparing and adding butter. 1.22 p. m.+11 minutes, heating to 146° F. 1.33 p. m.+30 minutes, holding at 146° F. 2.03 p. m.+45 minutes, emulsifying. 2.48 p. m., Batch VII completed.	1.51 p. m.+16 minutes, preparing and adding butter. 2.07 p. m.+11 minutes, heating to 146° F. 2.18 p. m.+30 minutes, holding at 146° F. 2.48 p. m.+45 minutes, emulsifying. 3.33 p. m., Batch VIII completed.
Batch V.		
11.02 a. m.+12 minutes, measuring powder and water. 11.14 a. m.+10 minutes, dissolving powder. 11.24 a. m.+16 minutes, emptying vat. 11.40 a. m., vat empty.		
Batch VI.		
11.47 a. m.+12 minutes, measuring powder and water. 11.59 a. m.+10 minutes, dissolving powder. 12.09 p. m.+16 minutes, emptying vat. 12.25 p. m., vat empty.		
Batch VII.		
12.44 p. m.+12 minutes, measuring powder and water. 12.56 p. m.+10 minutes, dissolving powder. 1.06 p. m.+16 minutes, emptying vat. 1.22 p. m., vat empty.		
Batch VIII.		
1.29 p. m.+12 minutes, measuring powder and water. 1.41 p. m.+10 minutes, dissolving powder. 1.51 p. m.+16 minutes, emptying vat. 2.07 p. m., vat empty.		

OPERATING FORCE.

A plant as described can be operated with a force of seven men. This force should consist of a foreman, who would have general charge of the plant and would personally operate the skimmed milk vat; an assistant foreman, who would spend his entire time on the balcony level, operating the pasteurizers and emulsors; three men operating the bottling and capping machine—one man feeding the machine with empties, one man removing the filled bottles, and one man handling the cases of empty and filled bottles—one man trucking the filled cans to the refrigerator, and one man operating the refrigerating machine and assisting as his time permits at any temporary point of congestion. The foreman and assistant foreman should be men skilled in the handling of milk and the operation of milk machinery, and the engineer should, of course, understand the operation of a refrigerating machine. The other employees may be of a good grade of laborers.

COST OF PRODUCING BOTTLED RECONSTRUCTED MILK.

The cost of producing bottled reconstructed milk will vary with the locality and with the market price of the various commodities used in the manufacture and handling of the product; therefore, no exact figures can be given. It can be stated, however, that the cost of a plant to manufacture reconstructed milk, and the number of men and the amount of power necessary to operate it, are no greater than similar items in the operation of an ordinary modern pasteurizing and bottling plant, and therefore, the cost of manufacturing and bottling reconstructed milk is approximately the same as the plant charge for pasteurizing and bottling fluid milk. The delivery charge is, of course, identical in both cases. The economic advantage gained by drying the skimmed milk and manufacturing butter at the point of production and reconstructing the milk at the point of consumption, rather than handling it in the normal fluid state, lies in the difference in price between sweet fluid milk delivered in bulk at the pasteurizing and bottling plant, and powder, butter, and water delivered at the same location, plus the economic advantage gained by always having the supply equal the demand.

Skimmed milk powder at the present time is manufactured in the great dairy regions of New York, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, and on the west coast. Sweet butter is also manufactured in quantity in these States. Distilled water can be produced locally. The prices of powder and butter are necessarily the market prices at the point of manufacture, plus the freight charges. During the past year (1919) the market price of skimmed milk powder at the factories has varied in carload lots from 20 cents to 26 cents per pound. Sweet butter has varied on the New York market from 46 cents to 71 cents per pound. Distilled water

can be made for less than one-quarter of a cent per gallon. Using these figures, the cost of the ingredients entering into a quart of milk containing 9 per cent solids not fat and 3.5 per cent fat will vary from 7.9 cents to 13.3 cents. To this must be added the freight on the powder and butter, which is a minor item. The price paid the producers in the South, during this period, for normal fluid milk has varied from 10 cents to 20 cents per quart, depending on the locality. It is certain, therefore, that in these sections reconstructed milk can be sold for a lower price than normal milk.

Whether reconstructed milk is more economical for a given community than normal fluid milk can only be determined by a careful comparison of the prices of the raw commodities delivered at the point of consumption.

If *all* the milk produced in the country could be dehydrated and subsequently reconstructed as needed to meet the demand, there is little doubt that a great financial saving to the country at large would result. Until such method is universally adopted a careful study of the local conditions of each community must be made before deciding on the correct method of milk handling.

From a bacterial standpoint reconstructed milk has decided advantages over market milk of good quality, as will be shown in the section on the bacteriology of this product.

THE QUALITY OF THE FINAL PRODUCT.

The manufacture of milk powder and reconstructed milk is in its infancy. The processes have been studied to some extent, but little is known regarding the effect of the various methods of drying and reconstructing on the composition of the finished product. Infant feeding experiments have been conducted in England, in which dried milk powder was used. These experiments are reported in Food Reports No. 24 to the local government board on Public Health and Medical Subjects, New Series No. 116.[3] These experiments indicate that children can be raised on reconstructed milk with no more difficulty than on normal cows' milk.

To the casual adult drinker of milk, carefully produced reconstructed milk made from the better grade of powders available in quantity on the market to-day, has the appearance of normal milk, except that it lacks a cream line. It has a flavor slightly more "cooked" than the pasteurized market milk. This flavor to many observers gives the impression of excessive "richness." It is not objectionable to those used to pasteurized milk, but is somewhat distasteful to those accustomed to drinking raw milk. The freshly made product very easily passes for first-class normal milk. One serious physical defect exists, however: the fat emulsion as produced

[3] See also "Dried Milk Powder in Infant Feeding: Safety, Usefulness, and Comparative Value—A Preliminary Report," by W. H. Price, Surgeon (R.), United States Public Health Service, Public Health Reports, vol. 35, No. 14, Apr. 2, 1920, pp. 809-828.—EDITOR.

at Nitro is not wholly permanent. On standing for 48 hours at a temperature approximately 35° F. or for 20 hours at room temperature, a thin crust of butter forms on the top of the fluid. If the milk is kept in an ordinary refrigerator and consumed within 24 hours no separation is noticed. This "buttering" in all probability is caused by some change in the complex ingredients of the skimmed milk brought about by the drying process. The power to hold fat in emulsion has been partially destroyed. As soon as this effect is overcome by the manufacturers, a product will be available which will readily compete with normal fluid milk. At present, reconstructed milk forms an excellent emergency supply which may readily take the place of normal milk during a shortage of the latter product.

Summary.

1. Reconstructed milk and cream made from skimmed milk powder, unsalted butter, and water have been produced in large quantities at Nitro, W. Va., and sold to the public.

2. The cost of manufacturing these products in the Southern States is less than the cost of local normal milk. As the distance between the points of efficient production and consumption is lessened, this difference in cost becomes less. In the dairy sections at the present time fluid milk can be sold more cheaply than reconstructed milk.

3. Reconstructed milk products serve as excellent emergency supplies, and as soon as the process of manufacturing milk powder is perfected they will no doubt compete in the open market with normal milk products.

Acknowledgments.

The authors wish to express their appreciation of the valuable assistance given them throughout this demonstration by Passed Asst. Surg. J. A. Watkins, of the United States Public Health Service, resident officer in charge of the department of medical relief and sanitation of Nitro; Mr. Hugh C. Leighton, executive officer of the Nitro commissary department; Mr. C. S. Bassett; Mr. L. C. Johnson; Mr. R. G. Soule; and all others who through suggestions or material aid helped in making the demonstration a success.

II. AN ANALYTICAL STUDY OF RECONSTRUCTED MILK.

By Albert F. Stevenson, Sanitary Engineer, and C. P. Reynus, Assistant Sanitary Engineer, United States Public Health Service.

Before any process devised for the handling of milk can be pronounced a success, an analytical study of the product, both from a bacteriological and chemical standpoint, must be made. If this study shows the product to be materially altered or to be a potential source of danger, from a health standpoint, the process is valueless.

It was therefore of the greatest importance to determine in this plant, the initial one producing reconstructed milk on a commercial

scale, whether the product was of a high or low grade, from a bacterial and chemical standpoint.

A plant laboratory was installed where bacteriological analyses could be made. It was possible by this means to check the plant operation and to determine, at all times, the quality of the product which was being sold. As is always the case, the field laboratory proved one of the most important assets of the plant. Samples of the finished product as well as samples from the various stages of the process of manufacture were analyzed daily. The finished product was again sampled and analyzed, after delivery, by the division of health and sanitation of the Nitro organization. These last analyses correspond to those which would be made by the board of health of an ordinary community.

The methods employed in making bacteriological analyses were those recommended by the committee on standard methods of milk analysis of the American Public Health Association. Samples were collected from the various stages of the process of manufacture, in glass test tubes plugged with nonabsorbent cotton. Filled pint bottles, selected at different periods during the day, served as bottled milk samples. These samples were refrigerated until the actual analysis was made, which occurred, generally, within two hours of the time of sampling. The culture media used for the bacteriological analysis were made at the Hygienic Laboratory in Washington, D. C., and shipped to Nitro in tin containers. The media were transferred from the cans to 4-ounce glass bottles, after arriving at the plant, and were then resterilized. A check titration was always made on each shipment of media, after the final sterilization in the glass bottles. Sterilization of media was accomplished by heating for one hour at 100° C. in an Arnold sterilizer for three consecutive days, and then incubating the media for 24 hours to throw out any contaminated bottles. The dilution water was sterilized in the same manner. Dry sterilization was accomplished in the oven of an ordinary gas stove. Forty-eight-hour 37° C. total counts were made on the various samples. No attempt was made to isolate any particular organism.

The results of the bacteriological determinations made on the finished reconstructed milk in the final containers are given in Table IV. Table V shows the results of arranging these counts in the order of magnitude. Seventy-five per cent of them were 5,000 or less. The highest count obtained was 55,000, and only three times was a count over 30,000 obtained.

Total counts made on the bottled milk by the department of sanitation are given in Table VI. Rearrangement of these counts in the order of magnitude, as shown in Table VII, emphasizes the fact that 15 per cent of them are under 1,000 and 97 per cent are under 5,000. Only one count out of the total 33 was greater than 5,000.

A bacteriological study of the manufacturing process brought out some useful information. Table VIII gives the number of bacteria present in reconstructed skimmed milk. These figures, of course, include both the number of bacteria in the water and in the milk powder.

TABLE IV.—*Bacterial content of finished product in container.*

Date.	Bacteria per c.c.	Date.	Bacteria per c.c.	Date.	Bacteria per c. c.	Date.	Bacteria per c. c.	Date.	Bacteria per c.c.
1918.		1918.		1918.		1918.		1919.	
Sept. 15	7,000	Nov 4	1,200	Nov. 25	1,300	Dec. 13	2,900	Jan. 7	1,200
16	8,000	5	6,900	26	1,400		2,100	8	1,500
	6,000		7,000		200		800		700
18	7,700		6,200		1,300		7,700	10	3,400
19	10,000		3,500		500	14	2,000		650
20	1,400	6	13,500		200	16	3,600		23,000
	5,100		3,700	27	2,500		28,000	11	20,000
	2,200		15,800		200		6,000		21,000
21	3,400	7	5,000	28	800	17	3,300		21,000
23	1,200		2,000		200	18	3,500		9,600
	300		2,500		200		600		4,600
	100		3,100		200		700		5,500
24	1,000	11	15,500	29	1,500	19	2,600	14	6,900
25	1,200	12	1,600		700		1,600		1,500
26	2,700		3,200	30	4,000	20	2,200		1,800
30	11,000		8,000		2,700		2,300	15	17,500
	2,400		1,600		3,800	21	19,000		3,000
	1,100		1,600	Dec. 1	2,100	23	15,600		4,500
Oct. 1	3,000		3,000		1,700		4,100	17	9,400
10	13,000	13	1,400		500		4,700		11,000
	400		3,000	2	4,600	24	8,600		12,000
11	13,500		2,800		500		2,800	18	19,000
12	7,000	16	4,700	3	15,000	26	10,000		18,000
14	30,100		6,200		2,000		2,200		55,000
16	1,200		2,700		2,000		700	21	1,600
17	3,100		2,100		1,000	27	4,000		200
	1,300		1,600		1,000		2,000	22	1,700
21	6,000	17	20,000		600		500		400
	4,400		1,100	4	300	28	26,000		11,000
22	1,200	18	4,500	5	2,600		1,800	23	4,000
	5,900		2,200		1,300		900		1,700
	2,100	19	2,400	6	1,600	30	4,400		1,300
23	13,000		1,100		1,000		2,000	26	5,700
	22,000		600	7	3,100		5,500		1,500
24	1,400		2,400		1,500	31	4,700		3,100
	2,100		200		5,000		1,200	27	300
28	3,300	20	2,700	9	1,500		600		1,400
	2,800		1,700		1,800		600		800
29	12,000	21	600		1,200	1919.		28	12,000
	6,800		600	10	4,300	Jan. 2	3,600		700
30	3,000		2,300		1,200		1,300		1,000
	500		2,800		800		26,000	30	1,300
31	2,000	22	1,100	11	3,700	3	1,600		1,000
	600		250		3,100		1,900		700
Nov. 2	2,000		600		1,000	4	2,000		1,000
3	1,000		6,000	12	5,000		3,000	31	2,800
4	30,000	24	1,600		2,900	6	2,300		1,000
	3,500		12,000		1,800		3,200		800
	1,000	25	1,900		2,800		500		1,300
	1,700		1,300	13	1,200	7	2,100		

TABLE V.—*Results of arranging bacteriological counts of bottled milk according to magnitude.*

Range of counts.	Number of counts within range.	Per cent of counts within range.	Range of counts.	Number of counts within range.	Per cent of counts within range.
Under 1,000	43	17.4	20,000–25,000	6	2.4
1,000–2,500	91	36.6	25,000–30,000	3	1.2
2,500–5,000	54	21.8	30,000–40,000	2	0.8
5,000–7,500	20	8.1	40,000–50,000	0	0.0
7,500–10,000	7	2.8	Over 50,000	1	0.4
10,000–15,000	13	5.3			
15,000–20,000	8	3.2	Total	248	100.0

TABLE VI.—*Bacteriological examinations of reconstructed milk made by the Sanitary Division, Nitro, W. Va.*

Date.	Source.	Bacteria per c. c.	Date.	Source.	Bacteria per c. c.
1918.			1918.		
Sept. 23	Mess Hall No. 2	2,000	Dec. 16	Hospital mess No. 2	200
24	Hospital mess	1,650	17	do	590
25	do	2,350	19	do	1,550
26	do	2,450	20	do	1,000
27	do	2,000	21	do	1,900
28	do	1,950	23	do	2,150
30	do	8,600	24	do	1,600
Oct. 1	do	1,950	26	do	2,100
2	do	2,600	27	do	2,450
3	do	2,900	28	do	2,000
4	do	2,700	31	do	2,800
5	do	2,850	1919.		
Nov. 11	do	900	Jan. 1	do	750
12	do	2,500	2	do	1,150
13	do	1,500	3	do	1,550
14	do	1,400	4	do	1,200
15	do	700			
16	do	1,800			

TABLE VII.—*Results of rearranging the bacteriological analyses made on the bottled milk by the Sanitary Division, Nitro, W. Va.*

Range of counts.	Number of counts within range.	Per cent of counts within range.
Under 1,000	5	15
1,000–5,000	27	82
Over 5,000	1	3
Total	33	100

TABLE VIII.—*Bacterial content of reconstructed skimmed milk.*

Date.	Bacteria per cc.	Date.	Bacteria per cc.
1918.		1918.	
Oct. 14	17,400	Dec. 14	58,000
16	61,000	16	246,000
17	113,000	19	40,000
22	27,600	26	12,100
30	4,200	27	23,000
Nov. 4	7,800	30	32,000
12	5,700	31	8,000
19	5,300	1919.	
22	15,000	Jan. 2	50,000
25	6,700	3	51,000
26	9,000	4	15,300
29	24,400	11	4,000
30	41,200	15	126,000
Dec. 1	61,000	17	40,000
3	43,500	18	280,000
9	27,400	23	12,000
12	39,000	30	22,000
13	22,000		

Rearrangement of these figures, as in Table IX, shows that 23.4 per cent of the counts are below 10,000, and 76.4 per cent are below 50,000.

TABLE IX.—*Result of arranging the bacterial counts of samples of reconstructed skimmed milk according to magnitude.*

Range of values.	Number of counts within range.	Per cent of counts within range.
Under 10,000	8	23.4
10,000–50,000	18	53.0
50,000–100,000	4	11.8
Over 100,000	4	11.8
Total	34	100.0

Table X gives the bacterial content of the butter used. A weighed amount of butter was added to sterile dilution water and the mixture warmed until the butter melted. This mixture was then shaken vigorously and the water layer analyzed. The results obtained are somewhat lower than might be expected.

TABLE X.—*Bacterial content of butter.*

Date.	Bacteria per c.c.
1918.	
Oct. 22	38,000
Nov. 4	13,000
22	2,000,000
30	250,000
Dec. 3	280,000
1919.	
Jan. 4	120,000
17	650,000
30	35,000

Counts were also made from the milk as it passes from the mixing and pasteurizing vats to the emulsors. These are shown in Table XI.

TABLE XI.—*Skimmed milk and butter mixture after pasteurization.*

Date.	Bacteria per c.c.	Date.	Bacteria per c.c.	Date.	Bacteria per c.c.	Date.	Bacteria per c.c.	Date.	Bacteria per c.c.
1918		1918		1918		1919		1919	
Oct. 16	1,600	Nov. 30	400	Dec. 13	520	Jan. 2	3,560	Jan. 22	30,000
17	500	Dec. 2	760	14	660	2	720	22	300
22	1,000	3	4,100	16	800	3	1,150	23	600
30	500	3	1,100	16	440	4	910	23	890
31	700	3	1,400	18	1,200	6	3,000	26	600
Nov. 4	3,100	4	1,100	18	200	7	3,200	26	780
12	2,600	4	180	19	910	8	600	27	500
12	4,400	7	5,100	21	6,500	10	2,600	27	1,100
19	100	7	600	23	6,000	11	12,600	28	1,800
22	150	9	370	26	100	11	7,100	28	910
22	70	10	24,600	26	580	14	7,900	30	1,400
25	830	10	800	27	100	14	1,400	30	740
25	340	11	14,000	27	930	15	21,200	31	450
26	310	11	600	28	1,750	15	1,600		
26	210	12	3,500	28	305	17	11,000		
28	170	12	950	30	820	17	9,400		
29	400	12	1,900	31	200	18	40,000		
30	1,700	13	2,400	31	580	18	9,300		

The killing of the bacteria in the butter and skimmed milk mixture depends, of course, on the length of time this mixture is heated. Samples taken at the first stages of a run or immediately after the 30-minute holding period, showed counts slightly higher than samples taken at the end of the emulsification period. This was due, of course, to the fact that the last of the mixture to flow from the mixing vats into the emulsors had approximately 45 minutes more heating at 146° F. than did the first of the batch. Typical results showing the variation in bacteria at the beginning and end of a batch are given in Table XII.

TABLE XII.—*Difference in bacterial count at beginning and end of batch from emulsors.*

Date.	Bacteria per c.c.	
	Beginning.	End.
1918.		
Dec. 1	1,400	450
3	2,600	420
11	7,200	720
12	6,000	710
16	1,300	450
26	1,200	780
1919.		
Jan. 2	1,100	920
11	15,000	3,700

Analyses were also made of the discharge from the emulsors and from the cooler. These figures show little if any variation from the corresponding counts on the milk coming directly from the mixing vats, and are not given.

Bacteriology of Cream.

Bacteriological counts were also made on the reconstructed cream which was produced at Nitro. A summary of these results is given in Table XIII. These figures, rearranged in the order of their magnitude (Table XIV) show that 74.2 per cent of the counts were below 10,000.

TABLE XIII.—*Bacterial content of cream.*

Date.	Bacteria per c. c.	Date.	Bacteria per c. c.
1918.		1918.	
Nov. 4	2,300	Dec. 13	7,700
12	7,600	13	3,400
18	4,000	17	3,100
18	4,500	23	6,600
21	1,500	27	4,500
23	9,600	27	38,000
24	400		
25	21,200	1919.	
30	25,000	Jan. 2	5,300
Dec. 2	4,300	4	6,000
2	2,000	10	6,200
3	12,000	13	5,100
7	6,000	20	27,000
7	5,900	24	50,000
7	5,100	25	3,200
10	23,000	29	2,100
12	72,000		

TABLE XIV.—*Results of arrangement of bacterial counts on reconstructed cream in order of magnitude*

Range of values.	Number of counts falling within range.	Per cent of counts falling within range.
Under 5,000	12	38.7
5,000–10,000	11	35.5
10,000–30,000	5	16.1
30,000–50,000	2	6.5
Over 50,000	1	3.2
Total	31	100.0

Bacterial Content of Ice-Cream Mix and Ice Cream.

There has been a decided controversy recently concerning the bacterial content of well-made ice cream, and many have taken the stand that it is impossible to produce good ice cream with a low bacterial count. At Nitro, ice cream was manufactured in a rather crude manner, one which would tend to give the product a much higher bacterial content than that produced with modern up-to-date machinery. The bacterial content of the ice-cream produced at Nitro was, therefore, determined with many misgivings, for it was thought that the figures might be misleading. Samples were taken of the mix shortly after it was manufactured and before any storage period had elapsed. Between the manufacture of the mix and the manufacture of the finished ice cream the mix was allowed to stand at a temperature of approximately 33° F. for 24 hours. On manufacturing, the mix gave 95–100 per cent "swell," showing that it was sufficiently aged to be commercially useful. Table XV gives the bacterial content of the ice-cream mix, and Table XVI that of the finished ice cream:

TABLE XV.—*Bacterial content of ice-cream mix.*

Date.	Bacteria per c. c.	Date.	Bacteria per c. c.	Date.	Bacteria per c. c.
1918.		1918.		1918.	
Oct. 12	1,700	Dec. 3	2,200	Dec. 30	4,600
Nov. 5	7,200	3	11,400		
11	2,100	7	15,000	1919.	
16	4,000	9	3,400	Jan. 3	5,000
18	1,300	10	4,600	8	5,100
20	2,200	12	6,400	13	6,700
21	800	14	15,400	17	31,000
26	2,100	18	1,300	20	5,000
26	7,000	21	1,700	21	4,000
30	2,800	24	6,500	24	6,000
30	1,600	24	22,600	29	70,000
Dec. 2	300	28	1,650	30	1,200

TABLE XVI.—*Bacterial content of ice cream.*

Date.	Bacteria per c. c.	Date.	Bacteria per c. c.	Date.	Bacteria per c. c.
1918.		1918.		1919.	
Nov. 18	30,200	Dec. 10	37,000	Jan. 20	84,000
21	2,000	12	7,000	21	9,000
26	105,000	18	18,800		
30	23,000	21	27,200		
Dec. 2	16,000	24	3,000		
7	4,500	28	1,800		

Rearrangement of these figures shows that 79.5 per cent of the counts on the ice-cream mix were below 10,000, and 71.5 per cent of the counts on the finished ice cream were below 30,000. These figures indicate that, under average conditions, an ice cream can be manufactured with a bacterial content which approximates that of well-pasteurized creams.

Butter-Fat Content of Reconstructed Milk.

In the operation of a plant manufacturing reconstructed milk, one of the important features is the proper mixing of the ingredients so that the percentage composition of the various constituents are as stated on the final package. The butter used in the making of the products at Nitro was bought with the moisture content guaranteed to be not over 15 per cent. Enough samples of this butter were analyzed to show that the specifications were being complied with, but no detailed analyses were made on the various tubs of butter used from day to day. It was assumed always that the butter contained at least 85 per cent fat. Butter-fat determinations made on the finished product brought out the fact that the butter purchased in many cases had a moisture content much less than 15 per cent, making the fat content of the milk greater than was guaranteed. This fact points out the great need for butter analysis, both by the manufacturer and by the purchaser. The moisture content of a sample from every churning, at least, should be determined, and if possible this figure should be stamped on the tubs shipped. In all cases a sufficient amount of butter was added to the milk mix to give 3½ per cent fat, assuming the butter contained 85 per cent butter fat.

Analyses of bottled milk were taken at first which showed that some variation existed in the fat content of the various containers as put on the market. A study was made to determine whether the fat content of the reconstructed milk at different points in the emulsification of a single batch varied. The results of these analyses are compiled in Table XVII. Those values which are grouped around definite points have been averaged, giving the values shown in

Table XVIII. These values have been plotted in Figure 8. It is easily seen that the fat content at the start is generally less than 3½ per cent, whereas at the end of the run it is much less than 3½ per cent. After 70 per cent of the batch has been run through the emulsor, there is a decided falling off in the percentage of butter fat

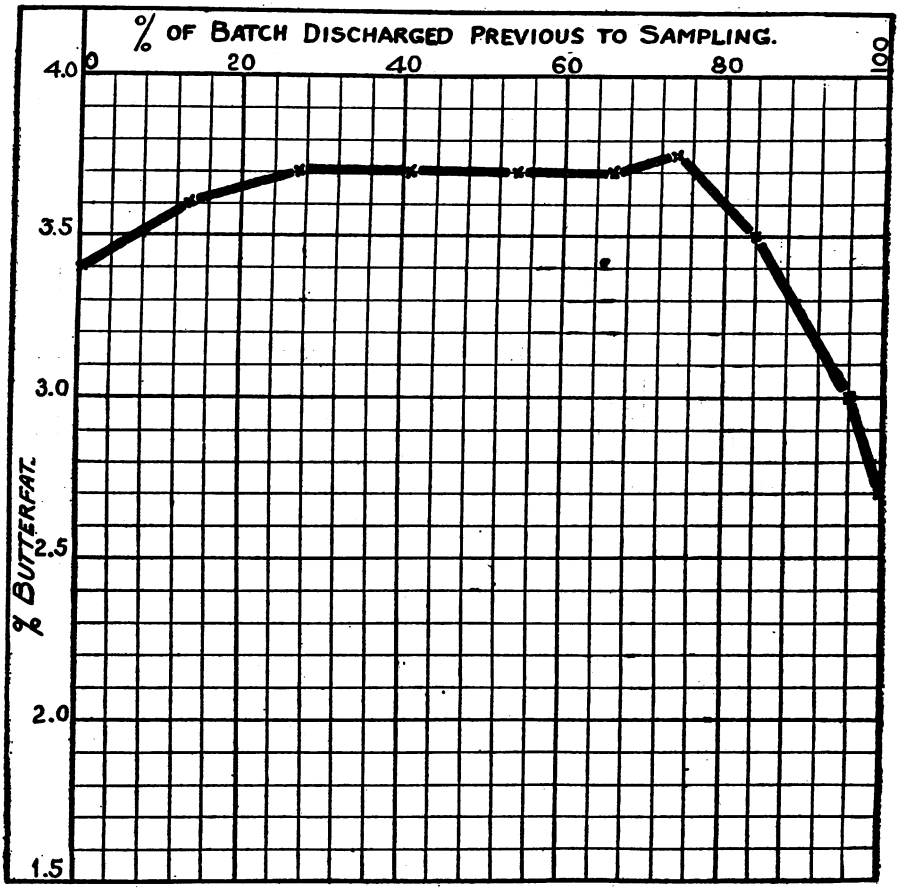


FIG. 8.—Variation in butter-fat content of reconstructed milk at various points in the manufacture of a single batch, Nitro, W. Va.

in the product. As the vat agitator is in continual motion during the whole process of the emulsion, the reason for the very consistent variation in fat content is not obvious. However, as the condition exists, a cold milk storage vat should be supplied with every installation to allow the equalization of the fat content before bottling.

TABLE XVII.—*Results of butter determinations made at various points during the emulsification of a batch of reconstructed milk.*

Date.	Per cent of run discharged previous to sampling.															
	0	3	12	13	14	16	25	27	28	29	38	40	42	43	50	53
1918.																
Dec. 11	3.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.6	.....
14	3.4	.....	3.5	.....	.....	.....	3.7	.....	.....	.....	3.7	.....	.....	.....	3.6	.....
14	3.4	.....	.....	.....	3.7	.....	.....	.....	3.8	.....	.....	.....	.....	3.8	.....	.....
1919.																
Feb. 8	3.4	3.4	.....	.....	.....	3.7	.....	.....	.....	3.6	.....	.....	3.6	.....	.....	.....
10	3.1	.....	.....	3.6	.....	.....	.....	3.9	.....	.....	.....	3.7	.....	.....	.....	3.8
11	3.5	.....	.....	3.6	.....	.....	.....	3.8	.....	.....	.....	3.8	.....	.....	.....	3.8

Date.	Per cent of run discharged previous to sampling.															
	55	57	62	67	68	72	75	80	81	83	86	87	88	93	94	97	100
1918.																	
Dec. 11	.....	.....	.....	.....	.....	.....	3.7	.....	.....	3.3	.....	.....	.....	.....	.....	.....	2.7
14	.....	.....	3.6	.....	.....	.....	3.6	.....	.....	.....	.....	.....	3.3	.....	.....	.....	2.8
14	.....	3.9	.....	.....	.....	3.9	.....	.....	.....	.....	3.5	.....	.....	.....	.....	.....	3.2
1919.																	
Feb. 8	3.5	.....	.....	.....	3.7	.....	.....	.....	3.6	.....	.....	.....	.....	.....	3.0	2.8	2.3
10	.....	.....	.....	3.8	.....	.....	.....	3.7	.....	.....	.....	3.5	.....	3.2	.....	.....	3.0
11	.....	.....	.....	3.8	.....	.....	.....	3.7	.....	.....	.....	3.7	.....	3.3	.....	.....	2.0

TABLE XVIII.—*Average values of butter-fat determinations made at various points during the emulsification of a batch of reconstructed milk.*

Per cent of run discharged previous to sampling.	Per cent butter fat.
0	3.4
14	3.6
27	3.7
41	3.7
54	3.7
66	3.7
74	3.7
84	3.5
95	3.0
100	2.7

Summary.

1. Studies of the bacterial content of this plant's output of reconstructed milk and cream show that it was satisfactory from a health standpoint.

2. It has been demonstrated that satisfactory ice cream can be manufactured on a commercial scale, with a bacterial content comparable to that of well-pasteurized milk and cream.

3. Using the revolving coil type of ice-cream batch mixer for mixing the ingredients entering into reconstructed milk, a product of homogeneous fat content can not be made, and the final product from an entire batch should be mixed before bottling.

SOME POSSIBILITIES IN THE STATISTICAL ANALYSIS OF CASE REPORTS OF VENEREAL DISEASES.[1]

By C. C. PIERCE, Assistant Surgeon General, and EDGAR SYDENSTRICKER, Statistician, United States Public Health Service.

In the campaign against venereal diseases a serious handicap has been experienced in the absence of certain fundamental statistical facts. These facts are available for most other important diseases, but, because of the lack of epidemiological studies and of the absence until recently of any system of case reports, they have not been collected for venereal diseases. Except for very small groups of persons no statistical data have been collected and analyzed for the purpose of showing the actual incidence of venereal diseases, the incidence among persons of different races and color, sexes, ages, marital condition, or among persons living under varying conditions of environment and social status. The only considerable amount of information which has been made available is that which exists in the records of physical examinations of selective service men in the war with Germany. Even this information covers only a few ages and relates only to males, is admittedly incomplete except for a fraction of those who were registered for service, and, so far, is only partially tabulated.

Without discussing the reasons for this absence of statistical facts, attention may be called briefly to the need for the fundamental data which statistics of this kind will afford, to some of the practical uses that may be made of them, and to the possibility of securing at least some of the most desired facts. In this connection, a few analyses of a limited number of venereal disease case reports are presented for illustrative purposes.

First, What is the practical need for statistical facts relating to venereal diseases?

As a program of preventive work progresses it becomes increasingly evident that the problems involved need to be defined more clearly. This clearer definition will be aided by answers to such questions as these: In what economic groups of our population do venereal diseases constitute the greatest menace? At what ages are their incidence and prevalence highest? With what social conditions are their prevalence most directly associated? What agencies can be utilized to the greatest advantage in preventive work among these persons of different sex, age, economic status, or other condition? A closer view of the actual situation in any population or population group will afford us a better knowledge of the lines along which preventive work can most efficiently be carried out. So far we have had to

[1] From the Statistical Office, prepared in cooperation with the Division of Venereal Diseases, United States Public Health Service. Special acknowledgments are made to Assis tant Statistician Dean K. Brundage, under whose immediate supervision the tabulations were made.

proceed with only a very vague idea of the real limits of the problem. We knew only that the problem was one of tremendous magnitude and that the time had come to attack it with such weapons as we had. Our program included all of the means for offensive warfare that we could think of and invent. We have been compelled to adopt a very general method of attack. Now, what we need is not only a broadside but the chance to take better aim. If the problems involved are more clearly defined, our marksmanship will be greatly improved.

Second, What sources of information are available or can be made available?

Until quite recently the reporting of venereal diseases has been wholly negligible. Mortality records, upon which so much reliance is placed in epidemiological studies of other diseases, are almost worthless in this instance. What we need, and eventually will have, are the carefully analyzed results of thorough and fairly complete studies of the epidemiology of venereal diseases among considerable groups of our population, in order that the conditions and factors influencing their incidence and prevalence may be made known and evaluated with scientific accuracy. While the time may not yet be ripe for studies of this kind upon a large scale, we can, in the meantime, make such use of reports collected by State and municipal health departments as the records themselves warrant. As the reports improve in accuracy and completeness, a greater yield of information will be afforded.

With the idea of ascertaining what information can be secured from the case reports which States require of physicians and clinics, not only for the purpose of obtaining such statistical data as they afford, but also for the purpose of judging the relative value of the inquiries included on the forms ordinarily used, the Statistical Office of the Public Health Service is tabulating and analyzing the individual case reports of venereal diseases in several States. The projected tabulations will include many thousand cases and will, it is believed, prove to be of great value. The work has just been begun, and the results are not yet available. As an example, however, of some of the results which a tabulation of even a relatively small number of cases will yield, certain tables are presented here showing the variation in age incidence of venereal diseases in a number of cantonment zones in which the Public Health Service actively cooperated in public health administration during the war.

These case reports for persons of different colors and sexes have been tabulated according to reported age at the time of onset of gonorrhea and syphilis. Since the case reports are admittedly incomplete, no attempt has been made to compute any rates. But it was found possible to ascertain approximately the *relative*

variation according to age of venereal disease incidence by the following method: First, the percentages were computed of the total cases for each color and sex group which were in each age, thus affording percentage distribution according to age. Then the percentage distribution of the populations in each color and sex groups was found.[2] Finally, the percentage of cases in each age was divided by the percentage of this enumerated population. The resulting ratios, therefore, may be said to indicate the variation in incidence of either disease or all venereal diseases according to age for each color and sex groups. It should be kept in mind that on the accompanying charts *no rates* are shown but only the *indicated relative variations* in reported age of onset.

The results of the tabulation and analysis of these fragmentary data can not be considered in any sense as conclusive, but they do suggest the general nature of some of the information which a statistical analysis of a large number of records will afford. For example, the tabulation of the case reports from cantonment zones suggests the following:

1. That *under the conditions prevailing in the areas included in cantonment zones*, the highest incidence of venereal diseases occurred at an earlier age among females than among males. For white females the modal or peak age was 19 as contrasted with the ages 19 to 23, inclusive, for white males. For colored females the highest incidence occurred at the age of 17 as contrasted with the ages 19 to 22, inclusive, for colored males. Thus the highest incidence occurred about two years earlier among females than among males. Although only civilian cases are included, it is possible, if not probable, that conditions peculiar to the "camp towns" may account partially for this difference in incidence.

2. Comparing whites and Negroes, the suggestion is afforded that the age at which the greatest incidence of venereal diseases occurs is definitely earlier among Negroes.

3. Comparing the relative variations in incidence of gonorrhea and syphilis, the suggestion is afforded that for both males and females gonorrheal infections tend to occur at an earlier age than syphilitic. This difference may be more apparent than real for the reason that the age of onset presumably may be less accurately reported for syphilis than for gonorrhea and a larger proportion of syphilitic cases classified according to the age of report rather than age of onset.

[2] Since the populations in the cantonment zones were seriously affected by unusual conditions existing during the war, the 1910 census data, even were they available in the detail desired, were of doubtful value. But the results of enumerations of relatively large samples of the populations of four zones by the Public Health Service, made in connection with special field studies of influenza in the latter part of 1918, were available in detail and were used to supply the needed information on the age distribution of persons of either color and either sex.

TABLE I.—*Relative variations*[1] *in the incidence of venereal diseases, according to age, among persons of different color and sex.*

(Based on case reports in 14 cantonment zones.)

Reported age at onset.	White.		Colored.	
	Males.	Females.	Males.	Females.
Under 15	2	19	9	22
15	69	53	71	206
16	58	191	150	206
17	233	447	275	733
18	300	409	383	393
19	571	650	533	286
20	557	382	380	244
21	493	319	471	278
22	580	317	457	183
23	609	188	287	153
24	313	129	209	277
25–29	244	165	176	88
30–34	158	65	107	65
35–39	57	45	73	62
40–44	40	30	24	14
45 and over	22	20	16	18

[1] The relative numbers in this table are a series of ratios obtained by dividing the percentage of total cases at each age by the percentage of the total population at the corresponding age. The population distribution used was that of sample areas in several of the cantonment zones in which special influenza surveys were made in 1918–19.

TABLE II.—*Relative variations*[1] *in the incidence of gonorrhea and of syphilis, according to age.*

(Based on case reports in 14 cantonment zones.)

Reported age at onset.	Gonorrhea.		Syphilis.	
	Males.	Females.	Males.	Females.
Under 15	4	22	6	18
15	45	111	103	164
16	132	333	79	44
17	300	885	166	351
18	446	383	272	450
19	693	536	333	407
20	579	310	362	317
21	476	247	494	326
22	568	265	523	237
23	415	208	602	165
24	305	211	247	207
25–29	202	109	240	152
30–34	112	54	169	93
35–39	55	26	82	77
40–44	33	8	37	32
45 and over	15	9	26	17

[1] The relative numbers in this table are a series of ratios obtained by dividing the percentage of total cases at each age by the percentage of the total population at the corresponding age. The population distribution used was that of the sample areas in several of the cantonment zones in which special influenza surveys were made in 1918–19.

Merely to suggest the possible use of more complete statistics, of this kind, a chart is presented in which are compared the relative variations in age incidence of venereal diseases, as shown by the cantonment reports, with the variations in the percentages of persons of corresponding ages who are attending school and who are married. The latter figures are taken from the Federal census reports for 1910

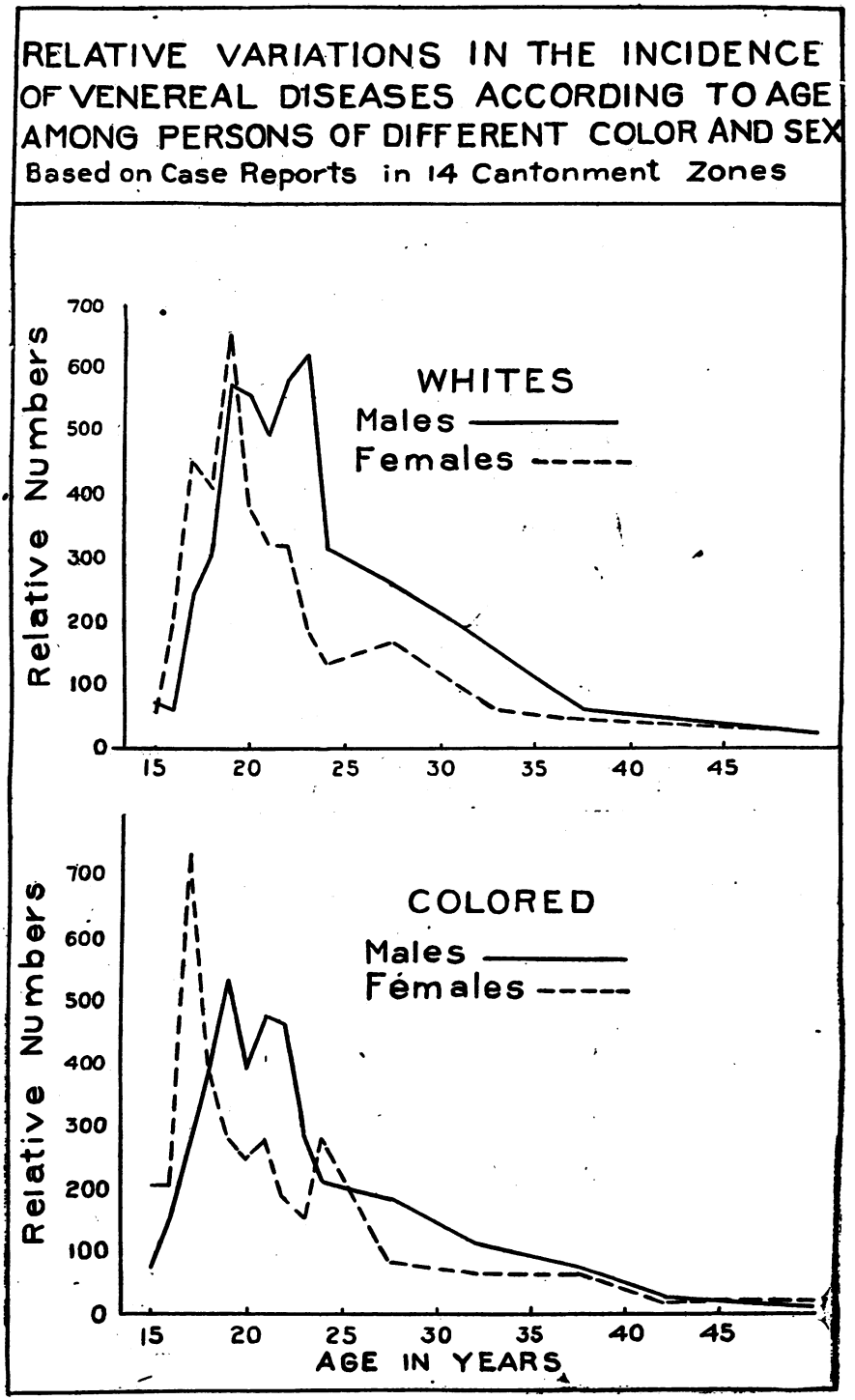

RELATIVE VARIATIONS IN THE INCIDENCE OF VENEREAL DISEASES ACCORDING TO AGE AMONG PERSONS OF DIFFERENT COLOR AND SEX
Based on Case Reports in 14 Cantonment Zones
Relative Numbers
700
600
500
400
300
200
100
0
WHITES
Males
Females
15
20
25
30
35
40
45
Relative Numbers
700
600
500
400
300
200
100
0
COLORED
Males
Females
15
20
25
30
35
40
45
AGE IN YEARS

FIG. 1.

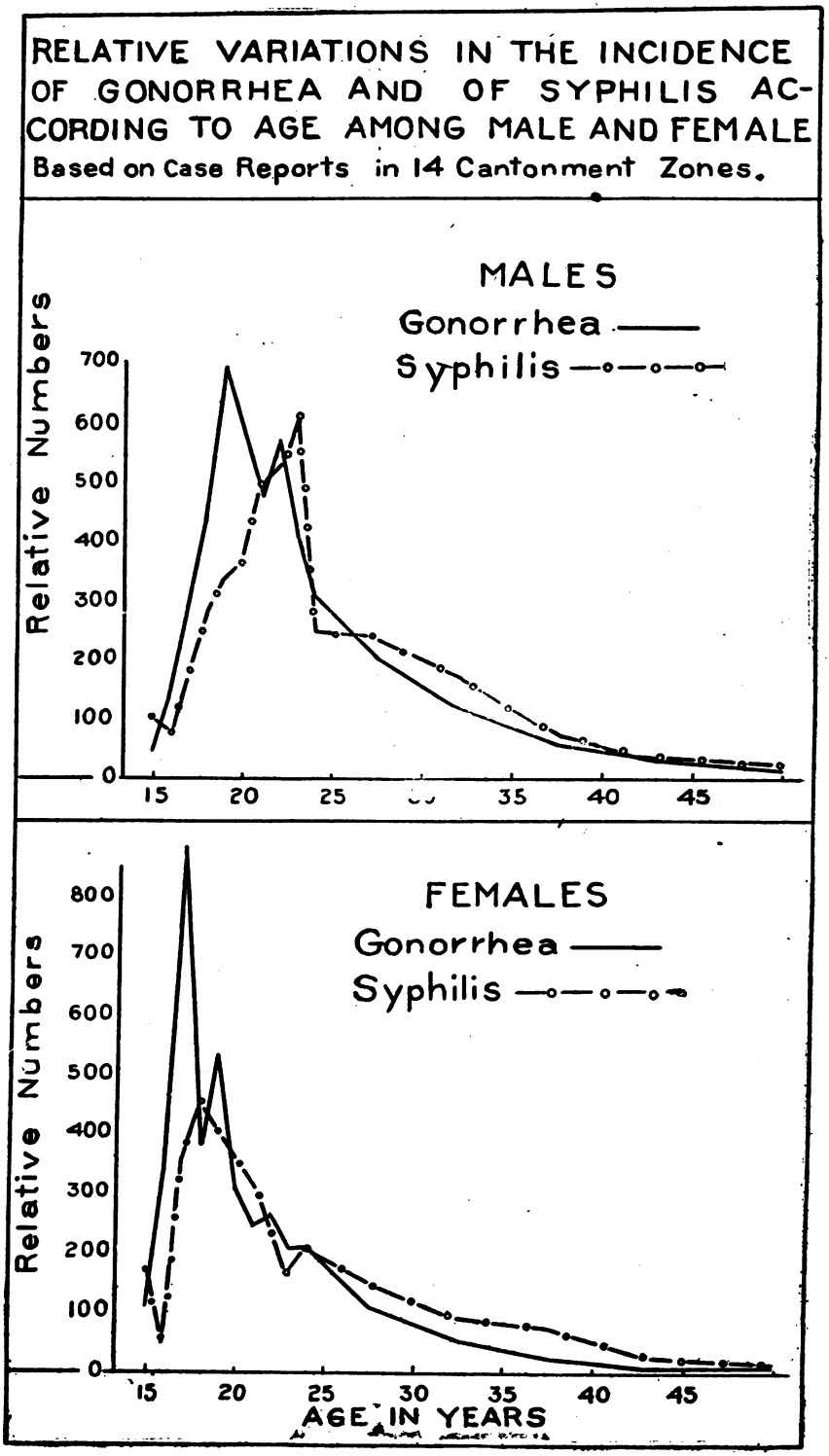

RELATIVE VARIATIONS IN THE INCIDENCE OF GONORRHEA AND OF SYPHILIS ACCORDING TO AGE AMONG MALE AND FEMALE
Based on Case Reports in 14 Cantonment Zones.
MALES
Gonorrhea
Syphilis
Relative Numbers
700
600
500
400
300
200
100
0
15
20
25
35
40
45
FEMALES
Gonorrhea
Syphilis
Relative Numbers
800
700
600
500
400
300
200
100
0
15
20
25
30
35
40
45
AGE IN YEARS

FIG. 2.

and, of course, are not strictly comparable with the data for venereal diseases. But the broad suggestion is afforded that, in the localities under consideration, venereal infections tend to occur most frequently at those ages when both males and females have finished their school attendance and before marriage. The sharp decline in school attendance is significant from the point of view of formal education

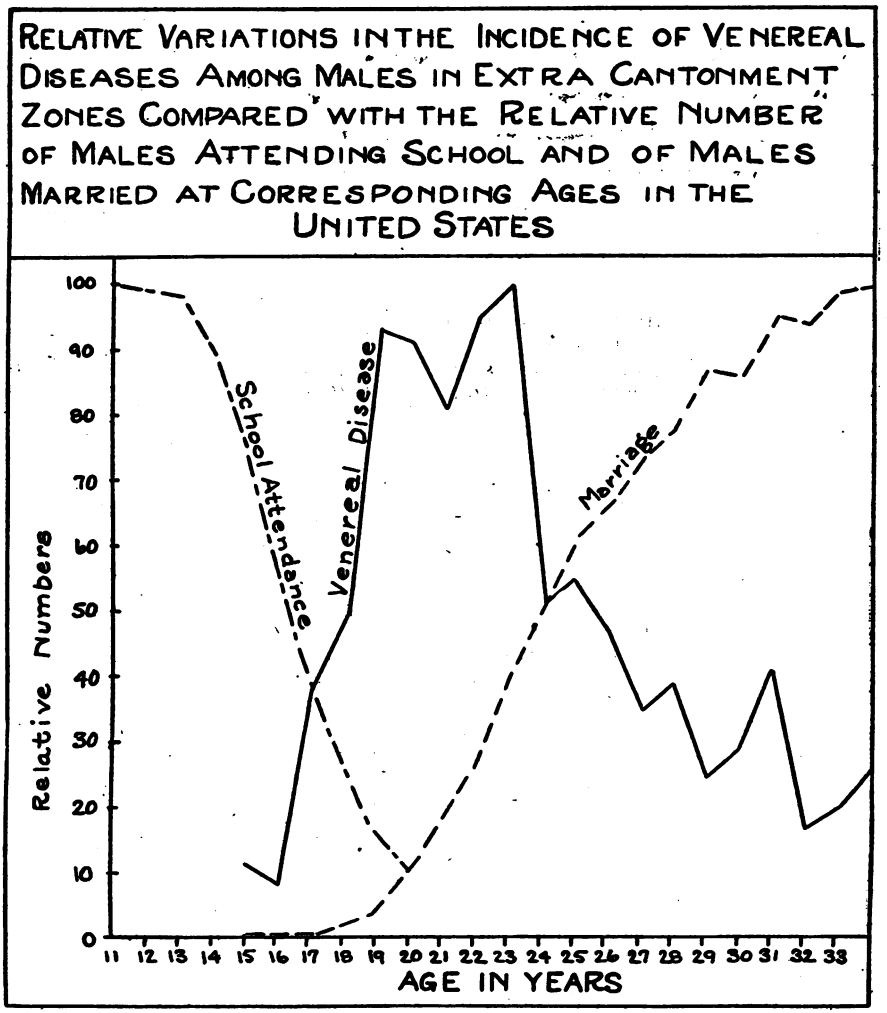


FIG. 3.

in the prevention of venereal infection. Quite clearly, if these preliminary statistics are corroborated by more complete data, children—especially children of that class of the population which we ordinarily suspect as being most subject to venereal disease infection—leave school long before they reach an age where education along these lines has been given. The high incidence of venereal diseases among persons at ages when it is economically

impracticable to undertake the responsibilities of marriage also helps to define the problem a little more clearly.

This is but a single illustration of some of the possible uses to which it is hoped a tabulation of a larger mass of more complete data may be placed. The onerous duty placed upon the physician and the clinician of filling out a somewhat detailed blank for each case is not altogether a useless one. When properly used, the records will be of great value and will, it is believed, not only lead to a more definite knowledge of the problems involved and suggest fields for more intensive studies of the factors and conditions influencing the prevalence of venereal diseases, but also make possible practical improvements in the forms used for the reporting of venereal disease cases. When we know something more about the incidence of venereal diseases among persons of different color, sex, and age in different economic, social, and racial groups, and living under varying environments, then it is quite certain that our preventive work will be more definitely outlined and more effectively directed.

TABLE III.—*Cases of venereal diseases reported in 14 extra-cantonment zones, classified according to color, sex, and reported age at onset.*

Reported age at onset.	Total.			White.			Negro.		
	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.
All known ages	2,302	1,861	441	1,181	958	223	1,121	903	218
Under 15	52	29	23	19	7	12	33	22	11
15	30	20	10	13	11	2	17	9	8
16	54	37	17	19	10	9	35	27	8
17	129	90	39	55	40	15	74	50	24
18	175	131	44	72	52	20	103	79	24
19	207	163	44	102	76	26	105	87	18
20	185	145	40	98	75	23	87	70	17
21	189	160	29	86	71	15	103	89	14
22	142	113	29	72	55	17	70	58	12
23	123	103	20	74	64	10	49	39	10
24	115	91	24	55	48	7	60	43	17
25	95	80	15	61	52	9	34	28	6
26	91	71	20	50	38	12	41	33	8
27	78	70	8	43	36	7	35	34	1
28	84	75	9	52	45	7	32	30	2
29	43	32	11	25	20	5	18	12	6
30	70	64	6	48	44	4	22	20	2
31	48	44	4	31	29	2	17	15	2
32	41	34	7	23	20	3	18	14	4
33	50	45	5	23	20	3	27	25	2
34	47	43	4	27	26	1	20	17	3
35	32	24	8	12	8	4	20	16	4
36	33	30	3	15	14	1	18	16	2
37	22	19	3	8	8	.....	14	11	3
38	16	14	2	8	7	1	8	7	1
39	23	21	2	14	13	1	9	8	1
40	16	15	1	12	11	1	4	4	.....
41	12	10	2	7	6	1	5	4	1
42	11	11	.....	7	7	.....	4	4	.....
43	5	2	3	4	2	2	1	.....	1
44	7	7	.....	4	4	.....	3	3	.....
45	16	12	4	9	8	1	7	4	3
46 and over	61	56	5	33	31	2	28	25	3

TABLE IV.—*Cases of gonorrhea reported in 14 extra-cantonment zones, classified according to color, sex, and reported age at onset.*

Reported age at onset.	Total.			White.			Negro.		
	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.
All known ages	1,237	1,033	204	625	510	115	612	523	89
Under 15	26	15	11	14	5	9	12	10	2
15	11	7	4	4	3	1	7	4	3
16	38	24	14	14	7	7	24	17	7
17	85	58	27	39	27	12	46	31	15
18	109	90	19	43	33	10	66	57	9
19	129	107	22	64	49	15	65	58	7
20	110	92	18	59	48	11	51	44	7
21	95	84	11	41	33	8	54	51	3
22	80	66	14	38	29	9	42	37	5
23	59	48	11	31	27	4	28	21	7
24	66	55	11	33	30	3	33	25	8
25	49	44	5	29	27	2	20	17	3
26	47	37	10	28	21	7	19	16	3
27	40	38	2	20	18	2	20	20	.....
28	43	39	4	27	23	4	16	16	.....
29	19	15	4	12	11	1	7	4	3
30	38	36	2	28	27	1	10	9	1
31	22	21	1	13	12	1	9	9	.....
32	16	15	1	11	10	1	5	5	.....
33	24	20	4	8	6	2	16	14	2
34	19	18	1	8	8	.....	11	10	1
35	13	11	2	7	5	2	6	6	.....
36	15	14	1	6	5	1	9	9	.....
37	12	11	1	4	4	.....	8	7	1
38	7	7	.....	4	4	.....	3	3	.....
39	7	7	.....	4	4	.....	3	3	.....
40	10	10	.....	7	7	.....	3	3	.....
41	3	3	.....	3	3	.....	.....	.....	.....
42	10	10	.....	6	6	.....	4	4	.....
43	2	1	1	2	1	1	.....	.....	.....
44	1	1	.....	1	1	.....	.....	.....	.....
45 and over	32	29	3	17	16	1	15	13	2

TABLE V.—*Cases of syphilis reported in 14 extra-cantonment zones, classified according to color, sex, and reported age at onset.*

Reported age at onset.	Total.			White.			Negro.		
	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.	Both sexes.	Male.	Female.
All known ages	889	668	212	468	366	102	412	302	110
Under 15	22	12	10	5	2	3	17	10	7
15	17	11	6	8	7	1	9	4	5
16	12	10	2	4	3	1	8	7	1
17	32	21	11	12	9	3	20	12	8
18	58	35	23	27	17	10	31	18	13
19	52	34	18	28	18	10	21	16	8
20	56	37	19	28	18	10	28	19	9
21	71	56	15	37	30	7	34	26	8
22	51	38	13	27	20	7	24	18	6
23	56	47	9	40	34	6	16	13	3
24	40	29	11	17	13	4	23	16	7
25	38	30	8	27	21	6	11	9	2
26	39	29	10	21	16	5	18	13	5
27	32	26	6	19	14	5	13	12	1
28	37	32	5	22	19	3	15	13	2
29	22	16	6	12	8	4	10	8	2
30	28	24	4	16	13	3	12	11	1
31	26	23	3	18	17	1	8	6	2
32	23	17	6	11	9	2	12	8	4
33	22	21	1	13	12	1	9	9	.....
34	23	21	2	15	14	1	8	7	1
35	16	11	5	5	3	2	11	8	3
36	15	13	2	8	8	.....	7	5	2
37	8	6	2	2	2	.....	6	4	2
38	8	6	2	3	2	1	5	4	1
39	16	14	2	10	9	1	6	5	1
40	4	3	1	3	2	1	1	1	.....
41	9	7	2	4	3	1	5	4	1
42	1	1	.....	1	1	.....	.....	.....	.....
43	3	1	2	2	1	1	1	.....	1
44	6	6	.....	3	3	.....	3	3	.....
45 and over	37	31	6	20	18	2	17	13	4

THE PRINCIPAL CAUSES OF DEATH COMPARED.

COMPARISONS, BY COLOR, OF THE DEATH RATES PER 100,000 PERSONS EXPOSED FOR THE SECOND QUARTERS AND THE FIRST HALF-YEARS OF 1918, 1919, AND 1920.

The accompanying tables, together with the analysis, are furnished by the Metropolitan Life Insurance Co., being the mortality records of the industrial department of that company for the periods covered. The figures are based on a strength of approximately 13,000,000.

In using the rates given in these tables it should be borne in mind that they apply to a selected group, and that while they are comparable with other rates within the group and give comparative health conditions of the periods covered, the rates themselves can not be compared with rates for the country at large.

Death rates per 100,000 persons exposed. Second quarters of 1918, 1919, and 1920 compared, by color, for principal causes of death.

[Metropolitan Life Insurance Co., Industrial Department.]

Causes of death.	Death rates per 100,000 persons exposed.					
	White.			Colored.		
	Apr.-June, 1920.	Apr.-June, 1919.	Apr.-June, 1918.	Apr.-June, 1920.	Apr.-June, 1919.	Apr.-June, 1918.
All causes of death	895.6	937.3	1,071.8	1,492.9	1,567.7	1,954.6
Typhoid fever	4.0	4.3	6.3	6.9	13.0	16.8
Measles	14.2	6.6	16.7	7.2	4.1	12.1
Scarlet fever	7.0	4.8	5.3	1.0	.3	1.8
Whooping cough	6.4	2.7	10.1	10.0	1.4	20.4
Diphtheria and croup	19.2	17.3	18.1	5.6	5.8	7.7
Influenza	29.4	58.9	15.2	71.0	106.4	43.4
Tuberculosis (all forms)	131.2	142.7	178.9	310.9	348.3	449.6
Tuberculosis of the lungs	117.8	128.4	159.7	291.7	313.8	401.2
Tuberculous meningitis	6.7	7.8	10.9	8.5	13.5	13.9
Other forms of tuberculosis	6.6	6.5	8.3	19.7	21.0	34.6
Meningitis—total	6.6	8.0	10.8	10.0	6.1	10.6
Cerebrospinal meningitis	5.6	6.1	6.8	7.9	5.5	7.1
Cerebral hemorrhage—apoplexy	57.4	53.7	58.6	89.2	89.5	87.2
Organic diseases of heart	111.3	105.4	128.6	180.0	173.5	223.6
Total respiratory diseases	105.8	115.3	162.4	166.1	211.6	358.1
Bronchitis	8.6	8.3	9.6	9.7	11.9	17.7
Broncho-pneumonia	32.1	34.8	35.9	35.9	45.6	61.5
Pneumonia—lobar and undefined	54.0	63.5	105.0	108.7	140.3	260.6
Other diseases of respiratory system	11.0	8.8	11.9	11.8	14.4	18.3
Diarrhea and enteritis	11.6	11.4	16.7	10.3	17.7	21.0
Under 2 years	5.0	5.6	8.7	3.1	5.2	7.1
2 years and over	6.6	5.8	8.0	7.2	12.4	13.9
Nephritis and Bright's disease	72.0	73.5	85.4	124.6	134.3	167.5
Total puerperal state	19.3	17.5	18.4	30.8	22.9	30.4
Puerperal septicemia	7.8	7.2	7.5	12.0	11.9	13.3
Puerperal albuminuria and convulsions	4.4	3.9	4.6	7.4	3.3	7.7
Other diseases of puerperal state	7.0	6.4	6.3	11.3	7.7	9.5
Total external causes [1]	63.5	96.6	104.1	83.3	98.3	113.2
Suicides	6.9	8.2	7.1	4.6	5.0	5.0
Homicides	3.1	4.0	2.5	21.5	30.7	21.9
Accidental and unspecified violence [2]	53.0	71.3	81.5	57.2	62.7	86.3
Accidental drowning	6.1	[3]	[3]	7.9	[3]	[3]
Automobile accidents	10.1	[3]	[3]	5.9	[3]	[3]
War deaths	.5	13.1	13.0	.....	1.9	2.7
All other and ill-defined causes of death	236.9	231.5	249.3	377.3	334.5	391.2

[1] Includes "war deaths." [2] Excludes "war deaths." [3] Data unavailable.

Death rates per 100,000 persons exposed. First half-years of 1918, 1919, and 1920 compared, by color, for principal causes of death.

[Metropolitan Life Insurance Co., Industrial Department.]

Causes of death.	Death rates per 100,000 persons exposed.					
	White.			Colored.		
	Jan.–June, 1920.	Jan.–June, 1919.	Jan.–June, 1918.	Jan.–June, 1920.	Jan.–June, 1919.	Jan.–June, 1918.
All causes of death	1,082.3	1,208.2	1,101.6	1,697.4	1,799.4	1,947.3
Typhoid fever	4.2	4.4	6.3	7.8	11.0	16.7
Measles	14.3	4.9	14.6	5.4	3.1	9.7
Scarlet fever	7.9	4.8	5.7	.5	.4	1.0
Whooping cough	7.7	3.3	9.5	9.5	2.1	16.6
Diphtheria and croup	24.4	20.9	20.8	6.1	6.4	8.1
Influenza	93.2	177.0	15.9	145.4	217.3	42.8
Tuberculosis (all forms)	132.6	150.1	174.9	310.6	329.6	422.6
Tuberculosis of the lungs	119.6	136.2	157.5	285.0	300.9	383.8
Tuberculous meningitis	6.5	6.9	9.7	6.6	10.6	10.7
Other forms of tuberculosis	6.6	7.0	7.6	19.0	18.0	28.1
Meningitis—total	6.7	8.3	10.6	9.2	6.2	10.6
Cerebrospinal meningitis	5.6	6.7	6.4	7.6	5.7	6.7
Cerebral hemorrhage—apoplexy	62.7	58.7	63.4	91.3	93.4	95.3
Organic diseases of the heart	126.6	121.0	136.6	187.3	184.4	221.6
Total respiratory diseases	181.4	201.4	173.9	290.4	312.9	368.4
Bronchitis	11.4	10.7	11.7	14.2	13.3	19.2
Broncho-pneumonia	53.2	53.6	40.0	61.5	64.3	61.8
Pneumonia—lobar and undefined	104.4	127.0	111.2	198.1	219.5	268.7
Other diseases of respiratory system	12.5	10.1	11.0	15.3	15.8	18.7
Diarrhea and enteritis	10.4	10.8	14.6	10.2	15.2	16.6
Under 2 years	4.5	5.0	6.8	3.5	3.8	5.2
2 years and over	5.9	5.8	7.8	6.7	11.5	11.3
Nephritis and Bright's disease	79.1	80.0	92.4	136.1	138.0	174.9
Total puerperal state	25.4	23.2	18.6	33.3	25.9	29.7
Puerperal septicemia	8.1	6.5	8.0	13.3	11.0	12.7
Puerperal albuminuria and convulsions	4.6	4.8	4.5	6.9	4.5	7.5
Other diseases of puerperal state	12.7	11.8	6.1	13.1	10.3	9.5
Total external causes [1]	61.2	101.6	89.8	84.7	113.5	119.4
Suicides	6.0	7.8	7.1	4.0	4.9	5.5
Homicides	3.0	3.7	3.3	19.7	29.6	24.2
Accidental and unspecified violence [2]	51.5	59.2	68.9	60.6	65.0	87.4
Accidental drowning	4.1	(3)	(3)	5.2	(3)	(3)
Automobile accidents	7.9	(3)	(3)	4.3	(3)	(3)
War deaths	.7	30.9	10.5	.4	14.0	2.2
All other and ill-defined causes of death	244.5	237.7	254.0	369.6	339.8	393.3

[1] Includes "war deaths." [2] Excludes "war deaths." [3] Data unavailable.

The outstanding facts in these mortality records for the first half year of 1920 are as follows:

In the first half of 1920 there was a decline of 10.4 per cent in the death rate for the white policyholders from that shown for the first half of the year 1919, and of 5.7 per cent for the colored. During the first quarter of each of these years there was a high mortality from epidemic influenza. During the first few months of 1919 the country was by no means through with the epidemic which began in the fall of 1918, and the mortality was still far above the normal. During the first quarter of 1920 the second influenza epidemic was at its height and there was again a high death toll, but the death rate for this quarter was lower than that for the corresponding quarter of 1919.

Comparison of the second quarter of 1920 with that of the corresponding quarter of 1919 shows a decline in the mortality rate.

Analysis of the mortality due to the most important causes of death shows that the chief factors in the decline of the general rate were the marked declines in the death rates for tuberculosis, pneumonia, influenza, and accidents.

Despite the decline in the general rate and in the rates for the important diseases mentioned above, the picture is not an entirely favorable one. In the case of the principal infectious diseases of children—measles, scarlet fever, whooping cough, and diphtheria—the mortality was higher in each instance during the first part of 1920 than it was during the first part of 1919. For measles the mortality was almost three times as high, and for whooping cough it was well over twice as high. The scarlet fever and diphtheria rates also show increases.

The rate for conditions incidental to the puerperal state shows a very decided increase for the first half of 1920 over that for the corresponding part of 1919. For the former period the rate for the white policyholders for these diseases increased 36.6 per cent over the rate for the first half of 1918. Closer analysis shows that increased mortality from puerperal septicemia was very largely responsible for the higher death rate for puerperal conditions.

Epidemic influenza, which raged in January and February, 1920, caused 6,536 deaths. These figures may be compared with 11,073 deaths from this disease during the first six months of 1919. There was a more pronounced drop in the death rate for 1920 for both white and colored policyholders.

Although influenza registered a very marked decline in the second quarter of 1920 as compared with the first quarter, it was nevertheless, responsible for the deaths of 1,139 policyholders. The rate for this disease during the second quarter was 29.4 per 100,000 white persons exposed, and 71.0 for colored.

PROMPT MOVEMENT OF WATER-SUPPLY CHEMICALS ASSURED.

On August 6, 1920, the Commission on Car Service of the American Railway Association, which is associated with the Interstate Commerce Commission in the execution of orders concerning interstate carriers, issued the following circular:

CIRCULAR CCS-68.

To Railroads:

The Bureau of the Public Health Service, in conjunction with the public health departments of different States, advises that there exists a widespread scarcity of chemicals necessary for water purification purposes throughout the country, together with more or less scarcity of raw materials in the hands of manufacturers of such chemicals.

To meet this situation, carriers are requested to take such action as will afford prompt movement of the following materials when to be used for the purification of public water supply, and for that purpose consigned to municipal authorities, or when for movement to plants for the manufacture of chemicals to be used for such purposes:

ALUMINUM SULPHATE.
BAUXITE.
CHLORINE.
CALCIUM HYPOCHLORITE.
SODA ASH.
COPPERAS.
LIME.
EMPTY CYLINDERS FOR CHLORINE SHIPMENT.

Full assurance was given the bureau that this circular included the movement of such chemicals even in cases of present or future embargo.

In regard to the procedure to be followed in case shipments of chemicals are still delayed, it is suggested that each shipment coming within the scope of the circular be taken up at once with the railroad concerned. In case relief is not obtained from the railroad, detailed facts should be telegraphed the Interstate Commerce Commission, and a copy of the telegram sent to the Bureau of the Public Health Service. Each case will be expedited at once by the Interstate Commerce Commission. The Bureau should be informed of all action taken on each shipment until the shipment is received in order that it may fully assist in the expediting of each case.

Because of present transportation difficulties it is strongly recommended that less than carload shipments, when urgently needed, be sent by express, especially shipments of liquid chlorine. Chemicals not required for several months may be sent by freight when in less than carload lots, and such shipments can be expedited to be received on time.

At the present time shipments of chemicals used in water purification are being expedited satisfactorily.

DEATHS DURING WEEK ENDED AUG. 14, 1920.

[From the "Weekly Health Index," Aug. 17, 1920, issued by the Bureau of the Census, Department of Commerce.]

Deaths from all causes in certain large cities of the United States during the week ended Aug. 14, 1920, infant mortality (per cent), annual death rate, and comparison with corresponding week of preceding years.

City.	Population Jan. 1, 1920, subject to revision.	Week ended Aug. 14, 1920.		Average annual death rate per 1,000.[2]	Per cent of deaths under 1 year.	
		Total deaths.	Death rate.[1]		Week ended Aug. 14, 1920.	Previous year or years.[2]
Akron, Ohio	208,435	31	7.8	[3] 8.6	22.6	[3] 14.1
Albany, N. Y	113,344	26	12.0	C 9.7	7.7	C 19.0
Atlanta, Ga	200,616	53	13.8	C 10.5	3.8	C 12.5
Baltimore, Md	733,826	217	15.4	A 14.9	29.5	A 25.9
Birmingham, Ala	178,270	45	13.2	A 17.6	20.0	A 12.7
Boston, Mass	747,923	218	15.2	A 14.5	22.0	A 24.7
Bridgeport, Conn	143,152	33	12.0	.....	33.3	.....
Buffalo, N. Y	505,875	127	13.1	C 11.4	17.3	C 21.8
Cambridge, Mass	109,456	15	7.1	A 12.1	26.7	A 29.3
Chicago, Ill	2,701,212	464	9.0	A 13.9	17.5	A 27.0
Cincinnati, Ohio	401,158	102	13.3	C 10.4	15.7	C 7.5
Cleveland, Ohio	796,836	145	9.5	C 12.8	25.5	C 29.2
Columbus, Ohio	237,031	50	11.0	C 9.1	14.0	C 17.1
Dayton, Ohio	153,830	23	7.8	C 6.9	8.7	C 25.0
Dallas, Tex	158,976	34	11.2	.....	17.6	.....
Denver, Colo	256,369	83	16.9	A 13.7	13.3	.....
Detroit, Mich	993,739	200	10.5	.....	24.5	.....
Fall River, Mass	120,485	32	13.8	C 8.2	40.6	C 47.4
Grand Rapids, Mich	137,634	23	8.7	C 6.5	21.7	C 17.6
Hartford, Conn	138,036	25	9.4	.....	24.0	.....
Indianapolis, Ind	314,194	71	11.8	C 9.1	15.5	C 13.0
Jersey City, N. J	297,864	59	10.3	C 11.3	25.4	C 17.2
Kansas City, Kans	101,177	18	9.3	.....	11.1	.....
Kansas City, Mo	[4] 313,785	113	18.8	C 12.5	23.9	C 13.3
Los Angeles, Calif	575,480	130	11.8	A 10.7	15.4	A 12.3
Louisville, Ky	234,891	36	8.0	C 12.7	19.4	C 10.5
Lowell, Mass	112,479	23	10.7	A 15.7	17.4	A 34.5
Milwaukee, Wis	457,147	69	7.9	A 9.1	20.3	A 29.2
Minneapolis, Minn	380,498	81	11.1	C 7.9	7.4	C 10.5
Nashville, Tenn	118,342	41	18.1	C 16.4	17.1	C 16.2
Newark, N. J	414,216	79	9.9	C 11.7	16.5	C 26.1
New Bedford, Mass	121,217	40	17.2	A 17.1	35.0	A 42.2
New Haven, Conn	162,390	37	11.9	C 11.7	43.2	C 8.3
New Orleans, La	387,219	106	14.3	A 17.9	17.9	A 12.8
New York, N. Y	5,621,151	1,153	10.7	C 9.9	20.2	C 19.6
Norfolk, Va	115,777	34	15.3	.....	20.6	.....
Oakland, Calif	216,361	38	9.2	A 10.1	21.1	A 11.2
Omaha, Nebr	191,601	37	10.1	C 6.9	16.2	C 20.0
Philadelphia, Pa	1,823,158	433	12.4	[3] 14.6	21.9	[3] 27.6
Pittsburgh, Pa	588,193	141	12.5	C 13.4	16.3	C 20.7
Portland, Oreg	258,288	57	11.5	C 8.4	8.8	C 7.3
Providence, R. I	237,595	67	14.7	C 7.7	22.4	C 25.7
Richmond, Va	[4] 160,719	56	18.2	C 14.3	32.1	C 31.8
Rochester, N. Y	295,850	60	10.6	C 9.6	15.0	C 13.0
St. Louis, Mo	772,897	138	9.3	C 10.7	13.0	C 8.9
St. Paul, Minn	234,595	49	10.9	C 8.9	10.2	C 0.0
San Francisco, Calif	508,410	100	10.3	C 11.0	5.0	C 8.5
Seattle, Wash	315,652	46	7.6	A 8.0	19.6	A 12.2
Spokane, Wash	104,204	20	10.0	C 9.0	15.0	C 0.0
Springfield, Mass	129,338	32	12.9	.....	21.9	.....
Syracuse, N. Y	171,647	48	14.6	C 15.0	31.3	C 28.6
Toledo, Ohio	243,109	65	13.9	A 16.5	13.8	A 16.0
Trenton, N. J	119,289	38	16.6	A 20.6	18.4	A 33.0
Washington, D. C	437,571	83	9.9	A 14.6	19.3	A 19.8
Worcester, Mass	179,754	37	10.7	C 11.4	10.8	C 15.4
Yonkers, N. Y	100,226	23	12.0	.....	8.7	.....
Youngstown, Ohio	132,358	20	7.9	.....	40.0	.....

[1] Annual rates per 1,000 population.
[2] "A" indicates data for the corresponding week of the years 1913 to 1917, inclusive. "C" indicates data for the corresponding week of the year 1919.
[3] Data are based on statistics of 1915, 1916, and 1917.
[4] Population estimated as of July 1, 1918.

Summary of information received by telegraph from industrial insurance companies for week ended Aug. 14, 1920.

Policies in force	43,848,228
Number of death claims	6,644
Death claims per 1,000 policies in force, annual rate	7.9

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.

Telegraphic Reports for Week Ended Aug. 21, 1920.

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

ALABAMA.	Cases.
Diphtheria	15
Malaria	27
Scarlet fever	12
Smallpox	6
Tuberculosis (pulmonary)	8
Typhoid fever	75
Whooping cough	5

ARKANSAS.	
Chicken pox	15
Diphtheria	17
Hookworm	1
Influenza	7
Malaria	299
Measles	13
Ophthalmia neonatorum	4
Pellagra	17
Scarlet fever	8
Smallpox	8
Trachoma	26
Tuberculosis	28
Typhoid fever	53
Whooping cough	24

CALIFORNIA.	
Cerebrospinal meningitis—San Francisco	1
Pellagra	2
Poliomyelitis:	
Clovis	1
Corcoran	1
Los Angeles County	1
Smallpox:	
Los Angeles County	11
Scattering	23
Typhoid fever	22

CONNECTICUT.	
Anthrax	1
Cerebrospinal meningitis:	
New Haven	2
Southington	1
Wallingford	1
Chicken pox	8
Diphtheria:	
Hartford	12
Scattering	25
Measles	13
Mumps	6
Pneumonia	4
Scarlet fever	23
Septic sore throat	1
Tuberculosis (pulmonary)	19
Typhoid fever	9
Whooping cough	78

FLORIDA.	
Diphtheria	6
Dysentery	3
Malaria	92
Ophthalmia neonatorum	1
Scarlet fever	5
Trichinosis	1
Typhoid fever	11

GEORGIA.	
Chicken pox	3
Diphtheria	16
Dysentery (bacillary)	16
German measles	1
Hookworm	9
Influenza	1
Malaria	265
Measles	7
Mumps	5
Paratyphoid fever	2
Pneumonia	7
Poliomyelitis	1
Scarlet fever	7
Septic sore throat	5
Smallpox	7
Tetanus	2
Trachoma	1
Tuberculosis (all forms)	21
Typhoid fever	59
Whooping cough	15

ILLINOIS.

Diphtheria:	Cases.
Chicago	74
Scattering	16
Influenza	2
Pneumonia—Chicago	86
Poliomyelitis—Chicago	7
Scarlet fever:	
Chicago	24
Scattering	16
Smallpox	22
Typhoid fever	20

INDIANA.

Cerebrospinal meningitis:	
Jackson County	1
Measles	9
Poliomyelitis:	
Martin County	1
Switzerland County	1
Scarlet fever	47
Smallpox	29
Typhoid fever	25

IOWA.

Chicken pox	3
Diphtheria	15
Measles	8
Pneumonia	1
Scarlet fever	23
Smallpox:	
Dubuque	11
Scattering	30
Tuberculosis (pulmonary)	1
Typhoid fever	2
Whooping cough	1

KANSAS.

Cerebrospinal meningitis	2
Chicken pox	2
Diphtheria	19
Influenza	1
Lethargic encephalitis	1
Measles	21
Mumps	3
Ophthalmia neonatorum	2
Pneumonia	4
Poliomyelitis	2
Scarlet fever	29
Smallpox	17
Trachoma	5
Tuberculosis	33
Typhoid fever	40
Whooping cough	41

LOUISIANA.

Diphtheria	5
Malaria	109
Measles	5
Pellagra	7
Plague (bubonic)	1
Scarlet fever	3
Tuberculosis	24
Typhoid fever	59

MAINE.

Chicken pox	2
Diphtheria	9
Dysentery	5
German measles	3

MAINE—continued.

Measles:	Cases.
Portland	9
Scattering	7
Scarlet fever	9
Tuberculosis	22
Typhoid fever	5
Whooping cough	12

MARYLAND.[1]

Cerebrospinal meningitis	2
Chicken pox	3
Diphtheria	17
Dysentery	14
German measles	3
Influenza	5
Lethargic encephalitis	2
Malaria	7
Measles	13
Mumps	1
Pneumonia (all forms)	18
Poliomyelitis	2
Scarlet fever	14
Septic sore throat	1
Smallpox	1
Tuberculosis	54
Typhoid fever	22
Whooping cough	44

MASSACHUSETTS.

Cerebrospinal meningitis	4
Chicken pox	16
Conjunctivitis (suppurative)	5
Diphtheria	82
Dysentery	3
German measles	1
Influenza	1
Measles	85
Mumps	16
Ophthalmia neonatorum	18
Pellagra	1
Pneumonia (lobar)	14
Poliomyelitis	21
Scarlet fever	38
Septic sore throat	1
Tetanus	1
Trachoma	1
Tuberculosis (all forms)	126
Typhoid fever	34
Whooping cough	160

MINNESOTA.

Smallpox	6

MISSISSIPPI.

Diphtheria	7
Influenza	5
Poliomyelitis	1
Scarlet fever	4
Smallpox	11
Typhoid fever	25

MONTANA.

Cerebrospinal meningitis:	
Huntley	1
Miles City	1
Diphtheria	2
Poliomyelitis:	
Malta	1
Scarlet fever	9
Smallpox	3

[1] Week ended Friday.

NEBRASKA.	Cases.
Cerebrospinal meningitis—Kramer	1
Chicken pox	1
Diphtheria	1
Measles	4
Mumps	1
Scarlet fever	3
Smallpox	13
Tuberculosis	2
Typhoid fever	2
Whooping cough	2

NEW JERSEY.	
Influenza	2
Pneumonia	11

NEW MEXICO.	
Chicken pox	2
Conjunctivitis	1
Diphtheria	3
Malaria	4
Measles	1
Mumps	2
Pneumonia	1
Scarlet fever	5
Tuberculosis	42
Typhoid fever	8
Whooping cough	13

NEW YORK.

(Exclusive of New York City.)

Anthrax—Candor	1
Cerebrospinal meningitis—Cohoes	1
Diphtheria	96
German measles	4
Influenza	2
Lethargic encephalitis	1
Measles	171
Mumps	24
Pneumonia	51
Poliomyelitis—Groton	1
Scarlet fever	41
Smallpox	1
Tetanus	2
Typhoid fever	30
Whooping cough	307

NORTH CAROLINA.	
Cerebrospinal meningitis	1
Chicken pox	14
Diphtheria	39
German measles	3
Measles	13
Ophthalmia neonatorum	1
Poliomyelitis	1
Scarlet fever	13
Septic sore throat	8
Smallpox	13
Typhoid fever	98
Whooping cough	162

OHIO.	
Typhoid fever—Summit County	40

SOUTH DAKOTA.	
Cerebrospinal meningitis	1
Diphtheria	7
Measles	7
Pneumonia	1
Poliomyelitis	1
Scarlet fever	4
Smallpox	6
Typhoid fever	4
Whooping cough	1

TEXAS.	
Anthrax—Bay City	1
Cerebrospinal meningitis—Dallas	1
Chicken pox	2
Diphtheria	8
Influenza	1
Malaria:	
Dallas	14
Scattering	11
Measles	3
Mumps	1
Paratyphoid fever	1
Plague (bubonic):	
Beaumont	2
Galveston	1
Pneumonia	2
Poliomyelitis—Dallas	1
Scarlet fever:	
Floyd County	9
Scattering	13
Tuberculosis	8
Typhoid fever	10
Whooping cough	21

VERMONT.	
Chicken pox	11
Diphtheria	1
Measles	23
Mumps	6
Poliomyelitis	1
Scarlet fever	4
Typhoid fever	1
Whooping cough	24

VIRGINIA.	
Smallpox:	
Tazewell County	3
Lee County, present.	

WASHINGTON.	
Chicken pox	9
Diphtheria	25
Measles	8
Scarlet fever	4
Smallpox	31
Typhoid fever	13
Whooping cough	19

WEST VIRGINIA.	
Cerebrospinal meningitis:	
Beckley	1
Wheeling	1
Diphtheria	10
Measles	4
Scarlet fever	2
Typhoid fever	8

WISCONSIN.	
Milwaukee:	
Diphtheria	20
Measles	3
Scarlet fever	7
Smallpox	13
Tuberculosis	21
Whooping cough	22

WISCONSIN—continued.

Scattering:	Cases.
Chicken pox	2
Diphtheria	31
Measles	36
Scarlet fever	29
Smallpox	58

WISCONSIN—continued.

Scattering—Continued.	Cases.
Tuberculosis	16
Typhoid fever	2
Whooping cough	53

Kentucky Report for Week Ended Aug. 14, 1920.

	Cases.
Chicken pox	1
Diphtheria	33
Dysentery	8
Influenza	9
Malaria	4
Measles	17
Mumps	1
Paratyphoid fever	3
Pellagra	1
Pneumonia	8
Scarlet fever	8
Septic sore throat	4
Smallpox	23
Tonsillitis	2
Trachoma	14
Tuberculosis	18
Typhoid fever	31
Whooping cough	28

SUMMARY OF CASES REPORTED MONTHLY BY STATES.

Tables showing, by counties, the reported cases of cerebrospinal meningitis, influenza, malaria, pellagra, poliomyelitis, smallpox, and typhoid fever are published under the names of these diseases. (See names of these and other diseases in the table of contents.)

The following monthly State reports include only those which were received during the current week. These reports appear each week as received:

State.	Cerebrospinal meningitis.	Diphtheria.	Influenza.	Malaria.	Measles.	Pellagra.	Poliomyelitis.	Scarlet fever.	Smallpox.	Typhoid fever.
1920.										
Florida (July)	1	13	26	178	9	11	1	5	17	52
Louisiana (July)	2	20	75	338	47	37	3	12	66	102
Michigan (July)	.....	609	.....	.....	596	.....	5	405	323	109
Minnesota (July)	3	212	2	.....	235	1	3	147	210	94
New Jersey (July)	13	278	8	11	923	.....	5	135	35	35
New York (June)	26	1,992	41	.....	9,044	.....	4	1,034	27	154
New York (July)	20	1,397	22	.....	4,129	.....	10	657	21	179
Pennsylvania (June)	11	828	.....	.....	7,929	.....	2	1,024	24	164
Rhode Island (July)	3	43	1	.....	83	.....	1	29	.....	4
West Virginia (July)	2	56	26	.....	425	.....	.....	107	155	135

RECIPROCAL NOTIFICATION.

Minnesota—July, 1920.

Cases of communicable diseases referred during July, 1920, to other State health departments by department of health of the State of Minnesota.

Disease and locality of notification.	Referred to health authority of—	Why referred.
Tuberculosis:		
Mayo Clinic, Rochester, Olmsted County.	Mayville, Trail County, N. Dak.	Moderately advanced.
	Thompson, Grand Forks, County, N. Dak.	Advanced case.
	Miles City, Custer County, Mont.	Do.
	Missoula, Missoula County, Mont.	Incipient case.
	Havre, Hill County, Mont.	Advanced case.
	Billings, Yellow Stone County, Mont.	Do.
	Seaton, Mercer County, Ill.	Arrested case.
	Chicago, Cook County, Ill.	Moderately advanced.
	Golden, Adams County, Ill.	Advanced case.
	Moline, Rock Island County, Ill.	Do.
	Joliet, Will County, Ill.	Moderately advanced.
	do.	Advanced case.
	Osceola, Kingsbury County, S. Dak.	Moderately advanced.
	Coloma, Tripp County, S. Dak.	Do.
	Howard, Miner County, S. Dak.	Advanced case.
	Bradley, Clark County, S. Dak.	Moderately advanced.
	Hurley, Turner County, S. Dak.	Positive case.
	do.	Moderately advanced.
	Covington, Miami County, Ohio.	Do.
	Bellevue, Huron County, Ohio.	Do.
	Gratiot, Lafayette County, Ohio.	Do.
	Montford, Grant County, Wis.	Do.
	Medford, Taylor County, Wis.	Advanced case.
	Appleton, Outagamie County, Wis.	Positive case.
	Cassville, Grant County, Wis.	Moderately advanced.
	Milford, Dickinson County, Iowa.	Advanced case.
	Manley, Worth County, Iowa.	Do.
	Kenset, Worth County, Iowa.	Moderately advanced.
	Eagle Grove, Wright County, Iowa.	Arrested case.
	Cantril, Van Buren County, Iowa.	Moderately advanced.
	Bernard, Dubuque County, Iowa.	Advanced case.
	Marion, Grant County, Ind.	Do.
	Frankfort, Clinton County, Ind.	Moderately advanced.
	Mays, Rush County, Ind.	Do.
	Harrisburg, Banner County, Nebr.	Advanced case.
	La Plata, Macon County, Mo.	Do.
	Rush Springs, Grady County, Okla.	Positive case.
	Clayton, Union County, N. Mex.	Moderately advanced.
	Frontenac, Crawford County, Kans.	Do.

ANTHRAX.

Louisiana, New Jersey, and New York.

During July, 1920, three cases of anthrax were reported in Louisiana and two were reported in New Jersey. Three cases were reported in the State of New York during June, 1920, one of which occurred in New York City, and five were reported during July, two being reported in New York City. During the week ended August 7, 1920, one case and one death were reported in New York City.

CEREBROSPINAL MENINGITIS.

State Reports for June and July, 1920.

Place.	New cases reported.
Florida (June):	
Escambia County—	
Pensacola	1
Louisiana (July):	
Allen Parish	1
Lafayette Parish	1
Total	2
Minnesota (July):	
Faribault County—	
Kiester	1
Goodhue County—	
Belle Creek Township	1
Pipestone County—	
Altona Township	1
Total cases	3
New Jersey (July):	
Bergen County	1
Cumberland County	1
Essex County	5
Hudson County	4
Passaic County	1
Union County	1
Total	13
New York (June):	
Albany County—	
Cohoes	1
Chemung County—	
Elmira	2
Dutchess County—	
Beacon	1
Erie County—	
Buffalo	3
Lancaster	1
Jefferson County—	
Antwerp (town)	1
New York	11
Niagara County—	
Niagara Falls	1
New York (June)—Continued.	
Otsego County—	
Oneonta (town)	1
St. Lawrence County—	
Stockholm (town)	2
Steuben County—	
Canisteo (town)	1
Cohocton (town)	1
Total	26
New York (July):	
Erie County—	
Buffalo	1
Depew	1
New York	17
Washington County—	
Whitehall	1
Total	20
Pennsylvania (June):	
Allegheny County	1
Armstrong County	1
Berks County	2
Fayette County	1
Mercer County	1
Northampton County	1
Philadelphia County	3
Westmoreland County	1
Total	11
Rhode Island (July):	
Providence County—	
Providence	2
Newport County—	
Newport	1
Total	3
West Virginia (July):	
Brooke County	1
Raleigh County	1
Total	2

City Reports for Week Ended Aug. 7, 1920.

The column headed "Average cases" gives the average number of cases reported during the corresponding week of the years 1915 to 1919, inclusive. In instances in which the information is not available for the full five years, the average includes from one to four years.

Place.	Average cases.	1920	
		Cases.	Deaths.
California:			
Sacramento	0	2	1
San Bernardino	.....	.....	1
Connecticut:			
Norwich	.....	.....	1
Illinois:			
Chicago	4	1	.....
Maryland:			
Baltimore	1	1	1
Cumberland	0	1	1
Massachusetts:			
Boston	(1)	1	.....
Gardner	0	1	.....
Lawrence	0	1	1
Lowell	0	.....	1
Michigan:			
Detroit	(1)	2	1
Highland Park	0	1	1
Minnesota:			
Minneapolis	0	1	.....
Missouri:			
Kansas City	0	2	2
Montana:			
Great Falls	(1)	1	.....
Missoula	0	.....	1
New Jersey:			
Newark	2	1	.....
Trenton	0	1	.....
New York:			
Cohoes	0	1	1
Geneva	0	1	.....
New York	7	5	2
Port Chester	0	1	1
Pennsylvania:			
Philadelphia	1	2	1
Tennessee:			
Memphis	0	2	.....
West Virginia:			
Huntington	.....	.....	1
Wheeling	(1)	.....	1
Wisconsin:			
Milwaukee	2	1	1

[1] Average less than 1.

DIPHTHERIA.

See Telegraphic weekly reports from States, p. 2061; Monthly summaries by States, p. 2064; and Weekly reports from cities, p. 2082.

INFLUENZA.

Florida and Minnesota Reports for July, 1920.

Place.	New cases reported.	Place.	New cases reported.
Florida:		Florida—Continued.	
Alachua County	1	Putnam County	2
Citrus County	1	Santa Rosa County	1
Dade County	2	Sumter County	2
Escambia County	1	Volusia County	1
Gadsden County	3	Washington County	1
Hillsboro County	1		
Tampa	2	Total	26
Jackson County	1		
Jefferson County	1	Minnesota:	
Lafayette County	2	Le Sueur County—	
Lake County	1	Elysian Township	2
Marion County	1		
Okeechobee County	1	Total cases	2
Orange County	1		

City Reports for Week Ended Aug. 7, 1920.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
California:			Massachusetts:		
Los Angeles	1	.....	Cambridge	1	.....
San Francisco	1	.....	New York:		
Connecticut:			New York	1	4
Hartford	.....	1	Ohio:		
Manchester	6	.....	Cincinnati	1	1
District of Columbia:			Cleveland	.....	2
Washington	.....	1	Pennsylvania:		
Illinois:			Philadelphia	.....	2
Chicago	1	2			
Maryland:					
Baltimore	6	.....			

LEPROSY.

Los Angeles, Calif., and Baltimore, Md.

During the week ended August 7, 1920, one case of leprosy was reported at Los Angeles, Calif., and one was reported at Baltimore, Md.

LETHARGIC ENCEPHALITIS.

Florida, New Jersey, New York, and Pennsylvania.

During July, 1920, three cases of lethargic encephalitis were reported in Florida. Sixteen cases were reported in New York during June, and six during July. Eight cases were reported in Pennsylvania during June. During the week ended August 7, 1920, one case was reported at Jersey City, N. J.

MALARIA.

Florida, Louisiana, and New Jersey—July, 1920.

Place.	New cases reported.
Florida:	
Alachua County	1
Bradford County	1
Calhoun County	1
Citrus County	9
Duval County	9
Jacksonville	31
Escambia County—	
Pensacola	2
Gadsden County	10
Hillsborough County	2
Tampa	6
Holmes County	1
Jackson County	2
Lafayette County	2
Leon County	25
Levy County	20
Marion County	3
Nassau County	2
Okeechobee County	1
Pinellas County	1
Polk County	6
Putnam County	1
St. Johns County	2
St. Lucie County	2
Santa Rosa County	1
Seminole County	6
Sumter County	1
Suwanee County	3
Taylor County	26
Washington County	1
Total	178
Louisiana:	
Assumption Parish	9
Ascension Parish	1
Allen Parish	7
Avoyelles Parish	25
Bienville Parish	1
Caddo Parish	1
Calcasieu Parish	14
Caldwell Parish	6
Concordia Parish	9

Place.	New cases reported.
Louisiana—Continued.	
De Soto Parish	49
East Baton Rouge Parish	3
East Carroll Parish	30
East Feliciana Parish	2
Evangeline Parish	1
Grant Parish	18
Iberia Parish	6
Iberville Parish	3
Jefferson Parish	2
Lafayette Parish	1
La Salle Parish	5
Morehouse Parish	10
Orleans Parish	1
Ouachita Parish	7
Plaquemines Parish	5
Pointe Coupee Parish	20
Rapides Parish	2
Red River Parish	11
St. Charles Parish	1
St. Helena Parish	1
St. James Parish	2
St. John Parish	1
St. Landry Parish	18
St. Martin Parish	12
St. Mary Parish	17
St. Tammany Parish	8
Terrebonne Parish	5
Union Parish	8
Vernon Parish	9
Webster Parish	6
West Baton Rouge Parish	1
Total	338
New Jersey:	
Bergen County	1
Essex County	4
Middlesex County	3
Somerset County	3
Total	11

City Reports for Week Ended Aug. 7, 1920.

Place.	Cases.	Deaths.
Alabama:		
Birmingham	4	
Arkansas:		
Little Rock	3	
North Little Rock	1	
California:		
San Francisco	2	
Connecticut:		
Greenwich	1	
Georgia:		
Atlanta	1	
Brunswick	4	
Rome	3	
Savannah	3	
Kansas:		
Kansas City	1	
Louisiana:		
Alexandria	21	
New Orleans	1	
New York:		
New York	1	
Ohio:		
Cincinnati	1	
Tennessee:		
Memphis	3	
Texas:		
Dallas	22	
Waco		1

MEASLES.

See Telegraphic weekly reports from States, p. 2061: Monthly summaries by States, p. 2064; and Weekly reports from cities, p. 2082.

PELLAGRA.

Florida, Louisiana, and Minnesota—July, 1920.

Place.	New cases reported.	Place.	New cases reported.
Florida:		Louisiana—Continued.	
Duval County	1	Madison Parish	5
Jacksonville	3	Orleans Parish	3
Hillsboroubh County	1	Pointe Coupee Parish	2
Tampa	1	Rapides Parish	4
Jackson County	1	Red River Parish	3
Orange County	1	Richland Parish	1
Polk County	1	St. James Parish	1
Santa Rosa County	1	St. Tammany Parish	1
Walton County	1	Tensas Parish	3
		Vernon Parish	4
Total	11	Total	37
Louisiana:			
De Soto Parish	4	Minnesota:	
East Carroll Parish	5	Pennington County—	
Lincoln Parish	1	St. Hilaire	1

City Reports for Week Ended Aug. 7, 1920.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
Georgia:			North Carolina:		
Atlanta		2	Winston-Salem	1	1
Louisiana:			Tennessee:		
Alexandria	1		Memphis	1	
Massachusetts:			Texas:		
Lynn	1		Dallas	1	
New York:					
New York		1			

PLAGUE.

Human Cases of Plague Reported.

Place.	Period covered.	Cases.	Deaths.	Remarks.
California:				
Alameda County	Apr. 19, 1920	1	1	Diagnosis confirmed Apr. 23.
Florida:				
Pensacola	June 2 to Aug. 16, 1920	7	4	
	Aug. 17–23, 1920	1		
Hawaii:				
Kalopa	Mar. 22, 1920	1		
Louisiana:				
New Orleans	Oct. 29 to Dec. 31, 1919	12	4	
	Jan. 1 to Aug. 16, 1920	5	1	
	Aug. 17–23, 1920	1	1	
Texas:				
Beaumont	June 26 to Aug. 16, 1920	13	4	
	Aug. 17–23, 1920	1	1	
Galveston	June 16 to Aug. 16, 1920	8	5	
	Aug. 17–23, 1920		1	
Port Arthur	July 7, 1920	1	1	From Galveston.

PLAGUE—Continued.

Plague-Infected Rodents.

Place.	Period covered.	Rodents found plague infected.
California:		
Ground squirrels (Citellus beecheyi)—	1920.	
Alameda County	Apr. 11 to Aug. 7	28
Contra Costa County	Apr. 18 to Aug. 7	46
Merced County	May 23 to Aug. 7	1
Monterey County	June 13 to Aug. 7	3
San Benito County	May 16 to Aug. 7	16
San Mateo County	do	3
San Joaquin County	Apr. 18 to Aug. 7	4
Santa Clara County	Apr. 11 to Aug. 7	12
Santa Cruz County	May 9 to Aug. 7	25
Santa Cruz	May 16 to Aug. 7	1
Stanislaus County	May 30 to Aug. 7	2
Florida:		
Pensacola	June 28 to Aug. 16	29
	Aug. 17–23	0
Louisiana:	1919.	
New Orleans	Nov. 1 to Dec. 31	276
	1920.	
	Jan. 1 to Aug. 16	285
	Aug. 17–21	0
Texas:		
Beaumont	July 1 to Aug. 16	[1]116
	Aug. 17–23	1
Galveston	June 21 to Aug. 16	[2]51
	Aug. 17–23	1

[2] Corrected figure to date.

Rodents Examined for Plague Infection.

Place.	Period covered.	Rodents examined.	Found infected.
Louisiana:			
New Orleans—			
Mus norvegicus	Week ended Aug. 7	3,035	0
Mus rattus	do	302	0
Mus alexandrinus	do	387	0
Wood rats	do	15	0
Miscellaneous	do	2	0
Putrid	do	174	0
Texas:			
Beaumont [1]—			
Mus norvegicus	Week ended July 31	712	.....
Mus rattus	do	78	.....
Mus alexandrinus	do	538	.....
Mus musculus	do	775	.....
Wood rats	do	291	.....
Miscellaneous	do	.....	.....
Putrid	do	121	.....

[1] During the week ended July 31, 1920, 2 rodents (classification not given) were found to be plague infected.

PNEUMONIA (ALL FORMS).

City Reports for Week Ended Aug. 7, 1920.

Place.	Cases.	Deaths.
Alabama:		
Birmingham		2
Mobile		1
Arizona:		
Tucson		2
California:		
Fresno		1
Los Angeles	13	9
San Bernardino		1
San Francisco	5	2
Colorado:		
Denver		2
Connecticut:		
Bridgeport		3
New Britain		2
New Haven		2
Delaware:		
Wilmington		1
District of Columbia:		
Washington		7
Georgia:		
Atlanta		3
Macon		1
Rome		2
Illinois:		
Chicago	56	20
East St. Louis		2
Galesburg	1	
Jacksonville		1
La Salle		1
Peoria		2
Springfield	2	1
Indiana:		
Fort Wayne		1
Gary		1
Indianapolis		2
La Fayette		1
Terre Haute		1
Iowa:		
Council Bluffs		1
Kansas:		
Coffeyville	1	
Fort Scott		1
Topeka		1
Kentucky:		
Lexington		1
Louisville		4
Louisiana:		
New Orleans		2
Maine:		
Portland		1
Sanford	1	
Maryland:		
Baltimore	12	10
Cumberland	2	
Massachusetts:		
Boston	6	7
Cambridge	1	
Chelsea		2
Danvers	2	2
Fall River	1	2
Greenfield		1
Lowell	1	2
Malden	1	1
Pittsfield	1	1
Salem	1	
Southbridge	1	
Springfield	2	
Michigan:		
Detroit	18	10
Grand Rapids	3	1
Highland Park	1	
Holland	1	
Kalamazoo	3	1
Minnesota:		
St. Paul	1	3
Missouri:		
Independence	2	2
Kansas City	5	5
St. Joseph		2
Montana:		
Billings		2
Great Falls	1	1
Missoula	1	1
Nebraska:		
Omaha		3
New Jersey:		
Atlantic City	2	
Bloomfield	2	
Elizabeth		2
Hackensack	1	
Long Branch	1	1
Montclair	1	
Newark	14	1
Orange		1
Passaic	3	2
Paterson	1	
Perth Amboy		1
Trenton	1	1
New York:		
Buffalo		8
Lackawanna	1	1
Newburgh		1
New York	46	57
Port Chester	1	1
Rochester	2	2
Rome	2	
Saratoga Springs	1	1
Syracuse	1	2
Troy	1	
White Plains	1	1
North Carolina:		
Rocky Mount	1	
Ohio:		
Akron	1	
Cincinnati	1	1
Cleveland	5	9
Dayton	1	
Ironton		1
Lorain	2	
Sandusky	1	
Springfield		1
Toledo		1
Youngstown		1
Oklahoma:		
Muskogee	1	1
Oklahoma City		1
Oregon:		
Portland		3
Pennsylvania:		
Philadelphia	27	26
Rhode Island:		
Providence		2
South Dakota:		
Sioux Falls	1	
Tennessee:		
Memphis		3
Nashville		1
Texas:		
Dallas		2
El Paso		3
Galveston		1
Virginia:		
Lynchburg		1
Richmond		5
West Virginia:		
Huntington		1
Parkersburg	1	1
Wheeling		1
Wisconsin:		
Milwaukee		5
Superior		1

POLIOMYELITIS (INFANTILE PARALYSIS).

State Reports for June and July, 1920.

Place.	New cases reported.
Florida (June):	
Okeechobee County	1
Louisiana (July):	
Orleans Parish	3
Michigan (July):	
Berrien County	2
Kent County	1
Wayne County	2
Total	5
Minnesota (July):	
Crow Wing County—	
Brainerd	1
Lyon County—	
Tracy	1
Nicollet County—	
Courtland Township	1
Total	3
New Jersey (July):	
Burlington County	1
Essex County	2
Hudson County	1
Morris County	1
Total	5
New York (June):	
New York	3
Wayne County—	
Walworth town	1
Total	4
New York (July):	
Herkimer County—	
Frankfort	1
New York	10
Niagara County—	
Royaltown town	1
Rockland County—	
Orangetown town	1
Wayne County—	
Walworth town	1
Total	14
Pennsylvania (June):	
Allegheny County	1
Armstrong County	1
Total	2
Rhode Island (July):	
Providence County—	
Providence	1

City Reports for Week Ended Aug. 7, 1920.

The column headed "Average cases" gives the average number of cases reported during the corresponding week of the years 1915 to 1919, inclusive. In instances in which the information is not available forhe t fu'l five years, the average includesfrom one to four years.

Place.	Average cases.	1920	
		Cases.	Deaths.
Alabama:			
Anniston	0	1	
Connecticut:			
New London	0	1	
Waterbury		1	
Illinois:			
Chicago	7	1	
Oak Park	0	1	
Massachusetts:			
Boston	[1]	5	2
Somerville	0	1	
Minnesota:			
Minneapolis	2	1	1
Missouri:			
St. Louis	[1]	1	
New Jersey:			
Jersey City	6	1	
New York:			
New York		2	
Pennsylvania:			
Philadelphia	7	1	
Wisconsin:			
Milwaukee	3	2	

[1] Average less than 1.

RABIES IN ANIMALS.

Rocky Mount, N. C., Wilmington, N. C., and Cincinnati, Ohio.

During the week ended August 7, 1920, one case of rabies in animals was reported at Rocky Mount and one at Wilmington, N. C., and one case was reported at Cincinnati, Ohio.

ROCKY MOUNTAIN SPOTTED OR TICK FEVER.

Missoula, Mont.—Week Ended Aug. 7, 1920.

During the week ended August 7, 1920, one fatal case of Rocky Mountain spotted or tick fever was reported at Missoula, Mont.

SCARLET FEVER.

See Telegraphic weekly reports from States, p. 2061; Monthly summaries by States, p. 2064; and Weekly reports from cities, p. 2082.

SMALLPOX.

State Reports for June and July, 1920—Vaccination Histories.

Place.	New cases reported.	Deaths.	Vaccination history of cases.			
			Vaccinated within 7 years preceding attack.	Last vaccinated more than 7 years preceding attack.	Never successfully vaccinated.	History not obtained or uncertain.
Florida (July):						
Duval County—						
Jacksonville	15					15
Levy County	2				2	
Total	17				2	15
Minnesota (July):						
Becker County—						
Height of Land Township	1				1	
Benton County—						
St. Cloud	2				2	
Blue Earth County—						
Mankato	1				1	
Pleasant Mound Township	1				1	
Carver County—						
Chaska	1				1	
Chippewa County—						
Clara City	2				2	
Crate Township	3				3	
Lone Tree Township	1				1	
Stoneham Township	2				2	
Clay County—						
Georgetown	2				2	
Clearwater County—						
Bagley	1				1	
Dakota County—						
Ingrove Township	1				1	
Freeborn County—						
Albert Lea	6				6	
Hayward Township	1				1	
Oakland Township	1				1	
Hennepin County—						
Minneapolis	79		1	5	30	43
Mound	1				1	
Minnetrista Township	1				1	
St. Anthony	4		1		2	1
Jackson County—						
Lakefield	4			1	3	
Kandiyohi County—						
Willmar	3				3	
Holland Township	1				1	
Lac qui Parle County—						
Madison	1					1
Lyon County—						
Tracy	1				1	
Mower County—						
Austin	3				3	
Murray County—						
Belfast Township	2				2	
Bondin Township	1				1	
Nicollet County—						
Lake Prairie Township	1				1	
Nobles County—						
Ellsworth	1				1	
Worthington	3				3	

SMALLPOX—Continued.

State Reports for June and July, 1920—Vaccination Histories—Continued.

Place.	New cases reported.	Deaths.	Vaccination history of cases.			
			Vaccinated within 7 years preceding attack.	Last vaccinated more than 7 years preceding attack.	Never successfully vaccinated.	History not obtained or uncertain.
Minnesota (July)—Continued.						
Olmsted County—						
Rochester	3				3	
Haverhill Township	3				3	
Pleasant Grove Township	1				1	
Ottertail County—						
Compton Township	1				1	
Pipestone County—						
Elmer Township	1					1
Polk County—						
Crookston	1				1	
Pope County—						
Minnewaska Township	1				1	
Ramsey County—						
St. Paul	19				19	
White Bear Township	1				1	
White Bear	6				6	
Renville County—						
Hawk Creek Township	1				1	
Rice County—						
Faribault	3				2	1
Webster Township	1				1	
Wells Township	1				1	
St. Louis County—						
Duluth	9		1	2	6	
Hibbing	1				1	
Culver Township	3				3	
Stearns County—						
St. Cloud	8				8	
Swift County—						
Benson	1				1	
Todd County—						
Eagle Bend	2				2	
Washington County—						
Stillwater	2				2	
Winona County—						
Lewiston	1				1	
Winona	8				5	3
Total	210		3	8	149	50
New Jersey (July):						
Bergen County	35			1	34	
New York (June):						
Cortland County—						
Homer	1				1	
Erie County—						
Buffalo	6				6	
Tonawanda	1				1	
Monroe County—						
Rochester	1				1	
Hamlin (town)	2			1	1	
Niagara County—						
Niagara Falls	4				4	
Newfane (town)	1				1	
Oneida County—						
Utica	1				1	
Whitestown (town)	5				5	
Ontario County—						
Canandaigua	1				1	
Orange County—						
Newburgh (town)	3				3	
Tompkins County—						
Ithaca	1				1	
Total	27			1	26	
New York (July):						
Cattaraugus County—						
Yorkshire (town)	1				1	
Erie County—						
Buffalo	4				4	

SMALLPOX—Continued.

State Reports for June and July, 1920—Vaccination Histories—Continued.

Place.	New cases reported.	Deaths.	Vaccination history of cases.			
			Vaccinated within 7 years preceding attack.	Last vaccinated more than 7 years preceding attack.	Never successfully vaccinated.	History not obtained or uncertain.
New York (July)—Continued.						
Franklin County—						
Fort Covington (town)	6				6	
Herkimer County—						
Middleville	1				1	
New York	5					5
Niagara County—						
Niagara Falls	1				1	
Oneida County—						
Clinton	1				1	
St. Lawrence County—						
Piercefield	2				2	
Total	21				16	5

State Reports for June and July, 1920.

Place.	Cases.	Deaths.
Louisiana (July):		
Ascension Parish	2	
Assumption Parish	7	
Avoyelles Parish	1	
East Baton Rouge Parish	3	
East Carroll Parish	14	
Franklin Parish	1	
Jefferson Parish	1	
La Salle Parish	2	
Morehouse Parish	2	
Orleans Parish	18	
Rapides Parish	8	
Tensas Parish	2	
Terrebonne Parish	1	
West Carroll Parish	8	
Washington Parish	1	
Total	66	
Michigan (July):		
Alger County	1	
Alpena County	1	
Arenac County	2	
Baraga County	5	
Berrien County	1	
Branch County	1	
Calhoun County	6	
Cass County	4	
Cheboygan County	8	
Eaton County	12	
Emmet County	6	
Genesee County	4	
Gogebic County	4	
Hillsdale County	1	
Houghton County	14	
Huron County	6	
Ingham County	17	
Iron County	2	
Jackson County	2	
Kalkaska County	1	
Kent County	3	
Lapeer County	1	
Leelanau County	34	
Macomb County	5	
Marquette County	9	
Mecosta County	2	
Monroe County	2	
Montcalm County	3	
Montmorency County	6	
Muskegon County	6	
Michigan (July)—Continued.		
Newaygo County	1	
Oakland County	13	
Oceana County	12	
Ontonagon County	3	
Ottawa County	3	
Sanilac County	2	
Schoolcraft County	6	
Washtenaw County	1	
Wayne County	113	
Total	323	
Pennsylvania (June):		
Allegheny County	6	
Armstrong County	4	
Bedford County	1	
Butler County	1	
Cambria County	2	
Erie County	1	
Greene County	3	
Somerset County	2	
Westmoreland County	4	
Total	24	
West Virginia (July):		
Boone County	2	
Brooke County	4	
Cabell County	3	
Fayette County	22	
Greenbrier County	13	
Jefferson County	1	
Kanawha County	16	
McDowell County	8	
Marion County	1	
Marshall County	2	
Mason County	4	
Mercer County	18	
Mingo County	4	
Monongalia County	13	
Nicholas County	7	
Raleigh County	6	
Taylor County	15	
Tucker County	3	
Wayne County	7	
Webster County	4	
Wyoming County	2	
Total	155	

SMALLPOX—Continued.

City Reports for Week Ended Aug. 7, 1920.

The column headed "Average cases" gives the average number of cases reported during the corresponding week of the years 1915 to 1919, inclusive. In instances in which the information is not available for the full five years, the average includes from one to four years.

Place.	Average cases.	1920	
		Cases.	Deaths.
Alabama:			
Birmingham	1	1	.....
California:			
Long Beach	0	1	.....
Los Angeles	(1)	8	.....
Pasadena	0	2	.....
Sacramento	0	1	.....
San Francisco	2	3	.....
Colorado:			
Denver	8	8	.....
Georgia:			
Atlanta	3	1	.....
Illinois:			
Chicago	3	2	.....
Decatur	0	1	.....
East St. Louis	0	3	.....
Peoria	(1)	1	.....
Rockford	0	1	.....
Rock Island	0	4	.....
Indiana:			
Elkhart	.....	2	.....
Gary	.....	1	.....
Huntington	.....	1	.....
Indianapolis	1	7	.....
Mishawaka	0	2	.....
South Bend	(1)	6	.....
Iowa:			
Cedar Rapids	(1)	2	.....
Dubuque	1	7	.....
Marshalltown	0	2	.....
Mason City	0	1	.....
Muscatine	0	1	.....
Sioux City	1	1	.....
Kansas:			
Parsons	0	2	.....
Topeka	0	2	.....
Kentucky:			
Paducah	.....	2	.....
Louisiana:			
New Orleans	(1)	1	.....
Maine:			
Auburn	.....	2	.....
Maryland:			
Baltimore	0	2	.....
Michigan:			
Battle Creek	3	2	.....
Detroit	3	10	.....
Flint	2	6	.....
Highland Park	0	12	.....
Pontiac	1	1	.....
Port Huron	.....	1	.....
Minnesota:			
Duluth	(1)	4	.....
Minneapolis	2	17	.....
St. Cloud	1	1	.....
St. Paul	1	9	.....
Stillwater	0	1	.....
Missouri:			
Independence	2	1	1
St. Louis	2	2	.....
Nebraska:			
Lincoln	1	1	.....
Omaha	4	1	.....
Nevada:			
Reno	0	1	.....
New Jersey:			
Montclair	0	1	.....
New York:			
New York	0	3	.....
Niagara Falls	0	2	.....
Ohio:			
Akron	2	8	.....
Alliance	0	4	.....
Canton	(1)	2	.....
Cincinnati	1	3	.....
Cleveland	3	3	.....
Columbus	0	9	.....
Lima	(1)	7	.....
Marion	0	4	.....
Springfield	(1)	1	.....
Oklahoma:			
Oklahoma City	2	1	.....
Oregon:			
Portland	4	6	.....
Pennsylvania:			
Connellsville	0	1	.....
South Carolina:			
Charleston	(1)	5	.....
Texas:			
Fort Worth	2	1	.....
Utah:			
Salt Lake City	5	14	.....
Virginia:			
Portsmouth	(1)	1	.....
Washington:			
Everett	(1)	2	.....
Seattle	3	9	.....
Spokane	2	7	.....
Tacoma	0	4	.....
Vancouver	0	2	.....
Yakima	1	4	.....
West Virginia:			
Bluefield	0	1	.....
Charleston	(1)	1	.....
Wisconsin:			
Appleton	0	2	.....
Fond du Lac	0	1	.....
Green Bay	0	1	.....
Milwaukee	2	2	.....
Oshkosh	1	2	.....
Sheboygan	0	1	.....
Superior	1	5	.....

(1) Average less than 1.

TETANUS.

City Reports for Week Ended Aug. 7, 1920.

Place.	Cases.	Deaths.	Place.	Cases.	Deaths.
California:			Massachusetts:		
San Diego	1		Holyoke	1	
Illinois:			Missouri:		
Chicago	1	2	St. Louis		1
Indiana:			Nebraska:		
Fort Wayne		1	Omaha	1	1
Kansas:			Pennsylvania:		
Kansas City	1		Philadelphia	1	
Maryland:					
Baltimore		1			

TUBERCULOSIS.

See Telegraphic weekly reports from States, p. 2061, and Weekly reports from cities, p. 2082.

TYPHOID FEVER.

State Reports for June and July, 1920.

Place.	New cases reported.
Florida (July):	
Baker County	4
Calhoun County	1
Clay County	2
Columbia County	1
Dade County	1
Duval County—	
Jacksonville	12
Escambia County	1
Pensacola	1
Flagler County	1
Hillsborough County—	
Tampa	8
Lee County	1
Leon County	1
Marion County	2
Monroe County—	
Key West	1
Orange County	2
Polk County	6
St. Lucie County	1
Santa Rosa County	1
Seminole County	1
Suwanee County	1
Walton County	3
Total	52
Louisiana (July):	
Ascension Parish	3
Assumption Parish	2
Avoyelles Parish	7
Beauregard Parish	5
Bienville Parish	1
Caddo Parish	4
Calcasieu Parish	1
Concordia Parish	3
Claiborne Parish	4
De Soto Parish	2
East Baton Rouge Parish	2
Evangeline Parish	3
Iberia Parish	4
Iberville Parish	2
Jefferson Parish	2
Lafayette Parish	4
La Salle Parish	1
Plaquemines Parish	3
Pointe Coupee Parish	2
Orleans Parish	10
Louisiana (July)—Continued.	
Rapides Parish	4
Red River Parish	3
Richland Parish	1
St. James Parish	4
St. Landry Parish	6
St. Martin Parish	1
St. Mary Parish	1
Tangipahoa Parish	1
Tensas Parish	1
Terrebonne Parish	5
Union Parish	4
Vermilion Parish	4
Washington Parish	2
Total	102
Michigan (July):	
Allegan County	1
Alpena County	1
Barry County	1
Bay County	8
Berrien County	1
Calhoun County	1
Charlevoix County	1
Genesee County	15
Grand Traverse County	2
Gratiot County	1
Ingham County	3
Ionia County	1
Jackson County	3
Kalamazoo County	1
Kalkaska County	2
Kent County	9
Lapeer County	3
Lenawee County	5
Macomb County	1
Marquette County	1
Mason County	1
Muskegon County	2
Oakland County	1
Oceana County	1
Otsego County	1
Shiawassee County	1
St. Clair County	2
Van Buren County	1
Wayne County	42
Total	109

TYPHOID FEVER—Continued.

State Reports for June and July, 1920—Continued.

Place.	New cases reported.
Minnesota (July):	
Beltrami County—	
Bemidji	1
Big Stone County—	
Johnson	1
Blue Earth County—	
Mankato	4
Carlton County—	
Cloquet	1
Crow Wing County—	
Brainerd	2
Goodhue County—	
Red Wing	1
Grant County—	
Ashby	1
Hennepin County—	
Minneapolis	6
West Minneapolis	1
Itasca County—	
Nashwauk	1
Koochiching County—	
International Falls	1
Lac qui Parle County—	
Boyd	1
Lake County—	
Two Harbors	3
Lyon County—	
Cottonwood	1
McLeod County—	
Hutchinson	1
Marshall County—	
Fork Township	1
Martin County—	
Fairmont	1
Olmsted County—	
Rochester	1
Ottertail County—	
Fergus Falls	2
Bluffton Township	1
Pennington County—	
Thief River Falls	1
Pipestone County—	
Pipestone	1
Ramsey County—	
St. Paul	40
Redwood County—	
Redwood Falls	2
Renville County—	
Cairo Township	1
St. Louis County—	
Duluth	4
Eveleth	1
Virginia	1
White Township	1
Stearns County—	
Melrose	1
Waseca County—	
Janesville	1
Washington County—	
Newport	1
Lincoln Township	1
Watonwan County—	
Madelia	2
Ormsby	1
Wilkin County—	
Breckenridge	1
Wolverton Township	1
Winona County—	
Winona	1
Total	94
New Jersey (July):	
Atlantic County	1
Bergen County	3
Burlington County	1
Camden County	6
Cumberland County	1
Essex County	5
New Jersey (July)—Continued.	
Gloucester County	1
Hudson County	6
Mercer County	6
Middlesex County	3
Morris County	1
Salem County	1
Total	35
New York (June):	
Albany County—	
Albany	1
Allegany County—	
Bolivar (town)	1
Scio (town)	1
Broome County—	
Binghamton	1
Chenango (town)	1
Cattaraugus County—	
Delevan	1
Cayuga County—	
Auburn	2
Chautauqua County—	
Jamestown	1
Cherry Creek	1
Clinton County—	
Plattsburg	1
Columbia County—	
Ghent (town)	1
Kinderhook (town)	1
Stuyvesant (town)	1
Delaware County—	
Walton	1
Erie County—	
Buffalo	6
Tonawanda	2
Franklin County—	
Moira (town)	1
Genesee County—	
Batavia	1
Jefferson County—	
Watertown	1
Theresa	1
Carthage	4
Monroe County—	
Rochester	1
Nassau County—	
Long Beach	1
New York	51
Niagara County—	
Somerset (town)	1
Oneida County—	
Rome	5
Marcy (town)	1
Whitesboro	1
Oriskany	1
Onondaga County—	
Syracuse	2
Clay (town)	1
Pomfret (town)	1
Ontario County—	
Philips (town)	1
Seneca (town)	1
Orleans County—	
Ridgeway (town)	1
Oswego County—	
West Monroe (town)	1
Otsego County—	
Oneonta	2
Worcester (town)	1
Rensselaer County—	
Troy	2
Rockland County—	
Nyack	1
Stony Point (town)	1
St. Lawrence County—	
Ogdensburg	1
Canton (town)	6
Lawrence (town)	1

TYPHOID FEVER—Continued.

State Reports for June and July, 1920—Continued.

Place.	New cases reported.
New York (June)—Continued.	
Saratoga County—	
Mechanicville	4
South Glenns Falls	1
Schenectady County—	
Schenectady	2
Schoharie County—	
Middleburg	3
Steuben County—	
Corning	1
Suffolk County—	
Babylon (town)	2
Amityville	5
Babylon	3
Tioga County—	
Nichols	1
Owego	6
Ulster County—	
Lloyd (town)	1
Olive (town)	1
Wayne County—	
Marion (town)	1
Wolcott (town)	1
Westchester County—	
Mount Vernon	2
Lewisboro (town)	1
Mamaroneck (town)	1
Briarcliff Manor	1
Wyoming County—	
Perry (town)	1
Total	154
New York (July):	
Albany County—	
Albany	6
Westerlo (town)	1
Cattaraugus County—	
Cold Springs (town)	1
East Otto (town)	1
S. Valley (town)	2
Cayuga County—	
Port Byron	1
Chautauqua County—	
Jamestown	3
Chemung County—	
Elmira	1
Clinton County—	
Beekmantown (town)	1
Plattsburg	1
Columbia County—	
Hudson	2
Philmont	1
Stockport (town)	1
Stuyvesant (town)	1
Cortland County—	
Homer	1
Delaware County—	
Davenport (town)	1
Dutchess County—	
Poughkeepsie	1
Erie County—	
Buffalo	4
Cheektowaga (town)	1
Clarence (town)	1
East Aurora	1
Lackawanna	1
Tonawanda	2
Fulton County—	
Gloversville	1
Green County—	
Greenville (town)	1
Herkimer County—	
Little Falls	1
German Flats (town)	1
Jefferson County—	
Theresa	1
Livingston County—	
Mount Morris	1

Place.	New cases reported.
New York (July)—Continued.	
Monroe County—	
Rochester	1
Montgomery County—	
Amsterdam	1
Nassau County—	
Long Beach	1
New York	78
Niagara County—	
Niagara Falls	3
North Tonawanda	3
Oneida County—	
Rome	1
Utica	1
Onondaga County—	
Camillus (town)	1
Cicero (town)	2
Liverpool	1
Marcellus (town)	1
Skaneateles (town)	1
Syracuse	5
Orange County—	
Newburgh	2
Walden	1
Oswego County—	
Oswego	1
Richland (town)	1
Rensselaer County—	
Rensselaer	2
Troy	1
Schenectady County—	
Schenectady	5
Seneca County	
Seneca Falls	2
Steuben County—	
Addison (town)	1
Corning	1
Painted Post	1
Wayne (town)	1
Suffolk County—	
Babylon	1
Central Islip State Hospital	1
Huntington (town)	1
Sullivan County—	
Fallsburg (town)	1
Tioga County—	
Nichols (town)	1
Owego	2
Tioga (town)	1
Elster County—	
Kingston	2
Elster (town)	1
Westchester County—	
Mamaroneck	3
Mount Vernon	1
New Rochelle	2
Yonkers	1
Total	179
Pennsylvania (June):	
Adams County	4
Allegheny County	15
Armstrong County	2
Bedford County	2
Berks County	1
Blair County	11
Bradford County	5
Bucks County	2
Butler County	2
Cambria County	4
Cameron County	1
Carbon County	2
Center County	1
Chester County	2
Clarion County	2
Clearfield County	3
Cumberland County	5

TYPHOID FEVER—Continued.

State Reports for June and July, 1920—Continued.

Place.	New cases reported.
Pennsylvania (June)—Continued.	
Dauphin County	2
Erie County	1
Fayette County	3
Franklin County	5
Greene County	2
Huntingdon County	1
Indiana County	3
Lancaster County	2
Lawrence County	2
Lebanon County	5
Luzerne County	1
Montgomery County	11
Northampton County	1
Northumberland County	3
Philadelphia County	37
Schuylkill County	8
Somerset County	1
Venango County	6
Washington County	1
Westmoreland County	1
York County	4
Total	164
Rhode Island (July):	
Providence County—	
Providence	3
Woonsocket	1
Total	4
West Virginia (July):	
Berkeley County	1
Boone County	12
Braxton County	6
Brooke County	2
Doddridge County	1
Fayette County	10
Greenbrier County	3
Hampshire County	3
Hardy County	1
Harrison County	5
Kanawha County	22
Lewis County	3
McDowell County	3
Marion County	13
Marshall County	3
Mercer County	2
Mineral County	5
Mingo County	4
Monongalia County	3
Monroe County	4
Ohio County	5
Preston County	11
Raleigh County	3
Roane County	1
Taylor County	1
Wayne County	2
Webster County	2
Wetzel County	1
Wirt County	1
Wood County	2
Total	135

City Reports for Week Ended Aug. 7, 1920.

The column headed "Average cases" gives the average number of cases reported during the corresponding week of the years 1915 to 1919, inclusive. In instances in which the information is not available for the full five years, the average includes from one to four years.

Place.	Average cases.	1920	
		Cases.	Deaths.
Alabama:			
Anniston	2	2	
Birmingham	28	5	
Mobile	3	3	1
Arkansas:			
Little Rock	3	1	
California:			
Alameda	0	2	
Fresno	0		1
Los Angeles	3	1	1
Redlands	(1)	2	
Sacramento	2	1	1
San Diego	(1)	1	
San Francisco	5	5	
Colorado:			
Colorado Springs	2	1	
Denver	1	6	1
Greeley	(1)	1	
Connecticut:			
Hartford	2	2	
New Haven	3	1	
District of Columbia:			
Washington	11	2	2
Georgia:			
Athens		2	1
Atlanta	3	5	2
Macon	1	2	1
Rome	3	2	
Savannah	4	3	
Illinois:			
Chicago	12	3	1
Kankakee	0	1	
Peoria	0	2	
Springfield	2		1
Indiana:			
Huntington		1	
Indianapolis	3	4	
Iowa:			
Muscatine	0	1	
Kansas:			
Atchison		1	
Coffeyville	4	1	
Fort Scott	0	4	
Hutchinson	1	1	
Kansas City	1	5	
Kentucky:			
Louisville	4	1	
Paducah		2	

[1] Average less than 1.

TYPHOID FEVER—Continued.

City Reports for Week Ended Aug. 7, 1920—Continued.

Place.	Average cases.	1920	
		Cases	Deaths.
Louisiana:			
New Orleans	9	11	.....
Maine:			
Portland	1	2	.....
Maryland:			
Baltimore	17	12	2
Cumberland	2	1	.....
Massachusetts:			
Amesbury	0	1	.....
Arlington	0	1	.....
Boston	4	4	.....
Brookline	0	1	.....
Fall River	5	2	.....
Lawrence	2	1	.....
Leominster	0	1	1
New Bedford	1	2	.....
North Adams	(1)	1	.....
Pittsfield	0	1	.....
Springfield	(1)	.....	1
Westfield	0	1	.....
Michigan:			
Alpena	.....	3	.....
Cadillac	0	1	.....
Detroit	11	7	1
Flint	1	17	2
Grand Rapids	1	1	.....
Minnesota:			
Minneapolis	1	3	.....
St. Paul	(1)	8	.....
Winona	0	2	.....
Missouri:			
Cape Girardeau	(1)	1	.....
Independence	1	2	.....
Joplin	0	1	.....
Kansas City	3	4	.....
St. Joseph	1	1	.....
St. Louis	16	3	2
Montana:			
Billings	0	3	.....
Missoula	0	1	1
New Hampshire:			
Dover	0	.....	1
New Jersey:			
East Orange	(1)	1	.....
Newark	(1)	1	1
Paterson	1	2	.....
West Hoboken	0	1	.....
New York:			
Albany	0	3	.....
Buffalo	8	.....	1
Geneva	(1)	1	.....
Ithaca	0	1	.....
Lockport	0	1	.....
New York	48	43	3
Rochester	3	1	1
Troy	1	2	.....
North Carolina:			
Charlotte	4	3	.....
Durham	1	4	.....
Wilmington	3	1	.....
Winston-Salem	7	3	.....
Ohio:			
Akron	1	1	.....
Barberton	0	2	.....
Canton	(1)	1	.....
Cincinnati	3	1	.....
Cleveland	4	2	4
Columbus	3	5	.....
Dayton	2	2	.....
Ironton	0	1	1
Lima	1	3	.....
Toledo	6	1	.....
Oklahoma:			
Muskogee	0	3	.....
Oklahoma City	3	1	.....
Oregon:			
Eugene	.....	1	.....
Pennsylvania:			
Chester	0	2	.....
Du Bois	(1)	1	.....
Lancaster	(1)	1	.....
New Castle	1	1	.....
North Braddock	0	1	.....
Philadelphia	11	11	2
Pittsburgh	5	2	.....
Reading	1	5	.....
Rhode Island:			
Providence	3	1	1
South Carolina:			
Charleston	6	2	.....
Tennessee:			
Knoxville	5	9	2
Memphis	5	2	.....
Nashville	19	5	1
Texas:			
Dallas	3	10	1
Fort Worth	(1)	3	.....
Galveston	2	2	.....
Utah:			
Salt Lake City	1	2	.....
Virginia:			
Alexandria	0	1	.....
Danville	1	3	.....
Norfolk	3	4	1
Petersburg	0	1	.....
Portsmouth	2	1	.....
Richmond	3	1	.....
Roanoke	3	1	.....
Washington:			
Seattle	2	1	.....
Spokane	0	1	.....
Yakima	(1)	5	.....
West Virginia:			
Fairmont	7	3	.....
Wisconsin:			
Fond du Lac	0	1	.....
Milwaukee	2	2	1
Racine	0	1	.....
Sheboygan	0	2	.....
Wyoming:			
Cheyenne	0	1	.....

[1] Average less than 1.

TYPHUS FEVER.

New York, N. Y.—June, 1920.

During June, 1920, one case of typhus fever was reported at New York, N. Y.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND TUBERCULOSIS.

City Reports for Week Ended Aug. 7, 1920.

City.	Population as of July 1, 1917 (estimated by U. S. Census Bureau).	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Aberdeen, S. Dak	15,926	3	6				1			
Adams, Mass	14,406	1			3					
Akron, Ohio	93,604	27	4		1		1		12	
Alameda, Calif	28,433	3	1				1			
Albany, N. Y	106,632		5		6				1	
Alexandria, La	16,232	3			1					
Alexandria, Va	17,959	2	1						1	
Allentown, Pa	65,109		3		1		1		3	
Alliance, Ohio	19,581	4								
Alpena, Mich	13,385						1			
Alton, Ill	23,783	4	3							
Altoona, Pa	59,712		2		1					
Amesbury, Mass	10,200	0					1			
Anaconda, Mont	10,631	0								
Ann Arbor, Mich	15,041	7								
Ansonia, Conn	16,954	0			1					
Appleton, Wis	18,005				1		1			
Arlington, Mass	13,073	3					2		1	
Asbury Park, N. J	14,629	6							2	
Ashland, Wis	[1] 11,594				1					
Ashtabula, Ohio	22,008	4	4				1			
Atchison, Kans	15,785				1				1	
Atlanta, Ga	196,144	58	2		4		1		1	2
Atlantic City, N. J	55,515	12	1	1	1				3	1
Attleboro, Mass	19,776	5	1							1
Auburn, Me	16,607	4								
Aurora, Ill	34,795	8			2					
Baltimore, Md	994,637	211	8		11		10		17	15
Bangor, Me	26,958								2	
Barberton, Ohio	14,187	1							1	
Battle Creek, Mich	30,159			1			4			
Bayonne, N. J	72,204		4		2		1		5	
Beatrice, Nebr	10,437	1								
Beaumont, Tex	28,851	6								
Bedford, Ind	10,613	2							2	1
Berlin, N. H	13,992	4								1
Bethlehem, Pa	14,353		3		2		1		7	
Beverly, Mass	22,128	2					1			
Biddeford, Me	17,760				2					
Billings, Mont	13,128	6								
Birmingham, Ala	189,716	59	2						2	9
Bloomfield, N. J	19,013	3			1		1		2	
Bloomington, Ill	27,462	5					1		2	
Bluefield, W. Va	16,123		1							
Boise, Idaho	35,951	7			1					
Boston, Mass	767,813	152	27	1	14		25	1	37	19
Bradford, Pa	[1] 14,544				1					
Brazil, Ind	10,472	4	1							1
Bridgeport, Conn	124,724	19	3				2		1	1
Bristol, Conn	16,318	0	1				2			
Brockton, Mass	69,152	8							1	
Brookline, Mass	33,526	2			2		1			
Brunswick, Ga	10,984								1	
Buffalo, N. Y	475,781	107		4						6
Burlington, Vt	21,362	5			1					
Butler, Pa	28,677				1					
Butte, Mont	44,057	11	2		8				6	3
Cadillac, Mich	10,158	5								
Cairo, Ill	15,985	3								
Cambridge, Mass	114,393	22	5		3	1	4		7	1
Canton, Ill	13,674	0								
Canton, Ohio	62,566	10	1						2	1
Cape Girardeau, Mo	11,146	3								
Chambersburg, Pa	12,475		1							
Charleston, S. C	61,041	11	1							2
Charleston, W. Va	31,060		1							
Charlotte, N. C	42,750	16	5						1	
Chelsea, Mass	46,405	12			7					1
Chester, Pa	41,857		2		1		2		1	
Cheyenne, Wyo	[1] 11,320	2					1			
Chicago Heights, Ill	22,853	6								
Chicago, Ill	2,547,201	518	91	5	43	1	35		162	44
Chicopee, Mass	29,950	6	2	1						
Cincinnati, Ohio	414,248	107	6		1		6		15	10

[1] Population April 15, 1910.

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

City Reports for Week Ended Aug. 7, 1920—Continued.

City.	Population as of July 1, 1917 (estimated by U. S. Census Bureau).	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cleveland, Ohio	692,259	139	17	1	10	.....	13	1	13	13
Clinton, Iowa	27,678	.....	1	.....	1	.....	.....	.....	.....	.....
Clinton, Mass	[1] 13,075	3	.....	.....	5	.....	.....	.....	.....	.....
Coatesville, Pa	14,998	.....	.....	.....	.....	.....	.....	.....	1	.....
Coffeyville, Kans	18,331	3	.....	.....	2	.....	.....	.....	.....	.....
Cohoes, N. Y	25,292	2	.....	.....	2	.....	.....	.....	.....	.....
Colorado Springs, Colo	38,965	11	2	.....	.....	.....	1	.....	10	5
Columbus, Ohio	220,135	56	3	1	1	.....	1	.....	4	3
Concord, N. H	22,858	5	.....	.....	1	.....	2	.....	.....	.....
Corpus Christi, Tex	10,789	6	.....	.....	.....	.....	.....	.....	1	1
Council Bluffs, Iowa	31,838	6	1	.....	.....	.....	.....	.....	.....	.....
Covington, Ky	59,623	13	1	.....	.....	.....	1	.....	1	2
Cranston, R. I	26,773	0	0	.....	.....	.....	.....	.....	0	.....
Cumberland, Md	26,686	9	.....	.....	.....	.....	3	.....	3	.....
Dallas, Tex	129,738	35	2	.....	9	.....	.....	.....	13	6
Danville, Ill	32,969	9	.....	.....	.....	.....	.....	.....	.....	.....
Danville, Va	20,183	.....	1	1	.....	.....	.....	.....	.....	.....
Dayton, Ohio	128,939	28	1	.....	1	.....	4	.....	1	.....
Decatur, Ill	41,483	8	.....	.....	.....	.....	.....	.....	.....	1
Dedham, Mass	10,618	1	.....	.....	.....	.....	.....	.....	.....	.....
Denver, Colo	268,439	59	16	1	5	.....	3	.....	.....	9
Des Moines, Iowa	104,052	.....	.....	.....	.....	.....	.....	.....	1	.....
Detroit, Mich	619,645	131	55	3	2	1	29	1	62	15
Dover, N. H	13,276	1	.....	.....	1	.....	.....	.....	.....	.....
Du Bois, Pa	14,994	.....	1	.....	.....	.....	.....	.....	.....	.....
Dubuque, Iowa	40,096	.....	2	.....	.....	.....	3	2	.....	.....
Duluth, Minn	97,077	13	.....	.....	4	.....	2	.....	6	1
Durham, N. C	26,160	7	.....	.....	.....	.....	.....	.....	.....	2
East Chicago, Ind	30,286	3	.....	.....	.....	.....	.....	.....	.....	2
Easton, Pa	30,854	.....	.....	.....	4	.....	.....	.....	.....	.....
East Orange, N. J	43,761	4	.....	.....	.....	.....	.....	.....	2	.....
East Providence, R. I	18,485	.....	.....	.....	1	.....	.....	.....	.....	.....
East St. Louis, Ill	77,312	13	.....	.....	.....	.....	1	.....	1	2
Eau Claire, Wis	18,887	.....	1	.....	.....	.....	1	.....	.....	.....
Elgin, Ill	28,362	.....	.....	.....	3	.....	.....	.....	2	.....
Elizabeth, N. J	88,330	.....	2	.....	2	.....	7	.....	7	.....
Elkhart, Ind	22,273	6	1	.....	.....	.....	.....	.....	.....	.....
Elmira, N. Y	38,272	12	.....	.....	.....	.....	.....	.....	.....	.....
El Paso, Tex	69,149	33	.....	.....	.....	.....	2	.....	.....	8
Englewood, N. J	12,603	2	.....	.....	.....	.....	.....	.....	.....	.....
Erie, Pa	76,592	.....	4	.....	6	.....	3	.....	1	.....
Eugene, Oreg	14,357	1	.....	.....	.....	.....	2	.....	.....	.....
Eureka, Calif	15,142	6	.....	.....	.....	.....	.....	.....	.....	.....
Evanston, Ill	29,304	5	2	.....	.....	.....	1	.....	.....	.....
Everett, Mass	40,160	3	.....	.....	.....	.....	.....	.....	.....	.....
Everett, Wash	37,205	.....	.....	.....	3	.....	.....	.....	.....	.....
Fairmont, W. Va	16,111	.....	.....	.....	.....	.....	1	.....	.....	.....
Fall River, Mass	129,828	31	3	.....	4	.....	.....	.....	9	3
Fargo, N. Dak	17,872	4	.....	.....	1	.....	.....	.....	.....	.....
Farrell, Pa	[1] 10,190	.....	1	.....	1	.....	.....	.....	.....	.....
Findlay, Ohio	[1] 14,858	3	.....	.....	.....	.....	.....	.....	.....	.....
Fitchburg, Mass	42,419	.....	3	2	3	.....	.....	.....	.....	1
Flint, Mich	57,386	24	7	.....	1	.....	2	1	.....	1
Fond du Lac, Wis	21,486	.....	1	.....	.....	.....	.....	.....	.....	.....
Fort Scott, Kans	10,564	5	1	.....	.....	.....	.....	.....	.....	.....
Fort Smith, Ark	29,390	.....	1	.....	.....	.....	3	.....	.....	.....
Fort Wayne, Ind	78,014	25	2	.....	.....	.....	6	.....	1	.....
Fort Worth, Tex	109,597	21	3	.....	.....	.....	1	.....	.....	.....
Fostoria, Ohio	10,950	0	.....	.....	.....	.....	1	.....	.....	.....
Freeport, Ill	19,844	4	.....	.....	.....	.....	.....	.....	.....	.....
Fremont, Nebr	10,060	0	.....	.....	.....	.....	.....	.....	.....	.....
Fremont, Ohio	11,034	1	.....	.....	.....	.....	.....	.....	.....	.....
Fresno, Calif	36,314	8	4	.....	.....	.....	1	.....	.....	.....
Galesburg, Ill	24,629	6	.....	.....	2	.....	.....	.....	.....	.....
Galveston, Tex	42,650	10	.....	.....	.....	.....	.....	.....	.....	.....
Gardner, Mass	17,534	2	.....	.....	1	.....	.....	.....	2	.....
Gary, Ind	56,000	5	2	.....	2	.....	1	.....	.....	.....
Geneva, N. Y	13,915	2	.....	.....	1	.....	.....	.....	.....	.....
Glens Falls, N. Y	17,160	4	.....	.....	.....	.....	.....	.....	.....	.....
Grand Rapids, Mich	152,861	20	3	.....	1	.....	1	.....	8	1
Great Falls, Mont	[1] 13,948	5	1	.....	1	.....	4	.....	.....	.....

[1] Population Apr. 15, 1910.

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

City Reports for Week Ended Aug. 7, 1920—Continued.

City.	Population as of July 1, 1917 (estimated by U. S. Census Bureau).	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Greely, Colo.	11,942	2			3					
Green Bay, Wis.	30,017						1			
Greenfield, Mass.	12,251	3			1					
Greensboro, N. C.	20,171	6								
Greenwich, Conn.	19,594	3								
Hackensack, N. J.	17,412	5			1					
Harrisburg, Pa.	73,276		1		3					
Harrison, N. J.	17,343				1		1			
Hartford, Conn.	112,831	37	7		7		2		1	1
Haverhill, Mass.	49,180	14	2		5		1		3	
Highland Park, Mich.	33,859	10	2		4		1		2	
Hoboken, N. J.	78,324	14			2				2	2
Holland, Mich.	13,459	3								
Holyoke, Mass.	66,503	8								
Hudson, N. Y.	12,898	4					1			
Huntington, Ind.	10,982	0							1	
Huntington, W. Va.	47,686	11								
Hutchinson, Kans.	21,461								1	
Independence, Mo.	11,964	5							1	
Indianapolis, Ind.	283,622	71	1	1	10		7		6	6
Ironton, Ohio.	14,079	6								
Ironwood, Mich.	15,095	5	2		6	1			4	1
Ishpeming, Mich.	[1] 12,448	1			1					
Ithaca, N. Y.	16,017	2							1	1
Jacksonville, Ill.	15,506	11								1
Jamestown, N. Y.	37,431	7	1		3					
Jefferson City, Mo.	13,712	3								
Jersey City, N. J.	312,557		17				1		10	
Johnstown, Pa.	70,437				2				4	
Kalamazoo, Mich.	50,408	8					4			
Kankakee, Ill.	14,270	6			2					
Kansas City, Kans.	102,086		1						5	
Kansas City, Mo.	305,816	75	2	1	2	2	2		12	11
Kearny, N. J.	24,325	7	1		2				1	
Keene, N. H.	10,725	8			1		1			
Kenosha, Wis.	32,833				4					
Kewanee, Ill.	13,607	3								
Knoxville, Tenn.	59,112		1	1					5	5
Kokomo, Ind.	21,929	3							2	1
Lackawanna, N. Y.	16,219	2	1		11					
La Crosse, Wis.	31,833		2							
La Fayette, Ind.	21,481	5	1				1			
Lake Charles, La.	14,930	1								
Lancaster, Ohio.	16,086	1			11				1	1
Lancaster, Pa.	51,437		9		2					
La Salle, Ill.	12,332	2	1						1	
Lawrence, Kans.	13,477	0								
Lawrence, Mass.	102,923	46			20		4		4	6
Leavenworth, Kans.	[1] 19,363	4	1				1			
Lebanon, Pa.	20,947						1			
Leominster, Mass.	21,365	3								
Lexington, Ky.	41,997	18							3	2
Lima, Ohio.	37,145	5					1			
Lincoln, Nebr.	46,957	14							1	
Little Rock, Ark.	58,716		1				1		2	
Lockport, N. Y.	20,028	3					3		1	
Logansport, Ind.	21,338						1			
Long Beach, Calif.	29,163	15	1						1	1
Long Branch, N. J.	15,733	1								
Lorain, Ohio.	38,266				2		2			
Los Angeles, Calif.	535,485	146	25		15		2		67	22
Louisville, Ky.	240,808	44	1	1					8	2
Lowell, Mass.	114,366	30	3		13		1		6	3
Ludington, Mich.	10,566	10					1			
Lynchburg, Va.	33,497	9			2					1
Lynn, Mass.	104,534	22	1		1		1		9	2
McKeesport, Pa.	48,299				1		1			
McKees Rocks, Pa.	20,795		3				1			
Macon, Ga.	46,099		2		1		1			
Malden, Mass.	52,243	10	6	2	2					
Manchester, Conn.	15,859	1							1	

[1] Population Apr. 15, 1910.

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

City Reports for Week Ended Aug. 7, 1920—Continued.

City.	Population as of July 1, 1917 (estimated by U. S. Census Bureau).	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Manchester, N. H.	79,607	12			1					
Manitowoc, Wis.	13,931		1				1			
Mankato, Minn.	[1] 10,365	2								
Marion, Ind.	19,923	2					1			
Marion, Ohio.	24,129						1			
Marlboro, Mass.	15,285	1	3				4		1	1
Marquette, Mich.	12,555	1			1					
Mason City, Iowa.	14,938	9	1				2			
Meadville, Pa.	13,968				1		1			
Medford, Mass.	26,681	7							3	1
Melrose, Mass.	17,724	4	2							1
Memphis, Tenn.	151,877	33	3						16	1
Meriden, Conn.	29,431						2		2	2
Methuen, Mass.	14,320	5			1		1			
Middletown, Ohio.	16,384	5					3			
Milwaukee, Wis.	445,008	80	11		14		11		17	9
Minneapolis, Minn.	373,448	76	6	1	8		8		23	8
Mishawaka, Ind.	17,083	0	1							
Missoula, Mont.	19,075	5			2					
Mobile, Ala.	59,201	17					1			1
Monessen, Pa.	23,070		1		2				2	
Montclair, N. J.	27,087	4	1		1					
Montgomery, Ala.	44,039	19	1						3	1
Morgantown, W. Va.	14,444	2			2					
Morristown, N. J.	13,410	8							1	1
Moundsville, W. Va.	11,513	2								
Mount Carmel, Pa.	20,709								1	
Mount Vernon, N. Y.	37,991	9								
Muscatine, Iowa.	17,713	6								
Muskogee, Okla.	47,173	3							2	2
Nanticoke, Pa.	23,811		1							
Nashua, N. H.	27,541	16					2	1		1
Nashville, Tenn.	118,136	32					1		3	3
Newark, N. J.	418,789	87	8	1	31	1	5		50	17
New Bedford, Mass.	121,622	33	1	1			2		9	1
New Britain, Conn.	55,385	14	3		2		2			
New Brunswick, N. J.	25,855								1	
Newburgh, N. Y.	29,893	10			2					
Newburyport, Mass.	15,201	4								
New Castle, Ind.	14,144				2				4	
New Haven, Conn.	152,275	50	3		1		5		13	5
New London, Conn.	21,199		1		1					1
New Orleans, La.	377,010	103							27	19
Newport, R. I.	30,585	1								
New York, N. Y.	5,737,492	1,080	135	9	38	3	43	2	[2] 350	[2] 101
Niagara Falls, N. Y.	38,466	9	3		2		9		3	
Norfolk, Va.	91,148								4	6
Norristown, Pa.	31,969				1					
North Adams, Mass.	[1] 22,019	2	1							1
Northampton, Mass.	30,006	6			2				2	
North Attleboro, Mass.	11,248	1								
North Braddock, Pa.	15,684		1							
North Little Rock, Ark.	15,515	4			1				1	
North Tonawanda, N. Y.	14,060	1								
Norwalk, Conn.	27,332	8							1	
Norwich, Conn.	21,923	2								
Oak Park, Ill.	27,816	5			1					
Ogdensburg, N. Y.	16,845	2								
Oil City, Pa.	20,162		1		1					
Oklahoma City, Okla.	97,588	14	1							
Old Forge, Pa.	15,479		1							
Olean, N. Y.	16,927	5								
Omaha, Nebr.	177,777	21	4		1		3			4
Orange, N. J.	33,636	10	1						2	1
Parkersburg, W. Va.	21,059	6								
Parsons, Kans.	15,952		1						1	
Pasadena, Calif.	49,620	3			4		2			
Passaic, N. J.	74,478	15		1	10				3	1
Paterson, N. J.	140,512				5				13	
Pawtucket, R. I.	90,666	10								

[1] Population Apr. 15, 1910.

[2] Pulmonary tuberculosis only.

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

City Reports for Week Ended Aug. 7, 1920—Continued.

City.	Population as of July 1, 1917 (estimated by U. S. Census Bureau).	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Peekskill, N. Y.	19,034	3		1						
Pekin, Ill.	10,973		1							
Peoria, Ill.	72,184	23					3	1	4	2
Perth Amboy, N. J.	42,646	9			1				3	
Petersburg, Va.	25,817	12			3				2	2
Philadelphia, Pa.	1,735,514	392	45	1	35		26		71	39
Phillipsburg, N. J.	15,879	4								
Phoenixville, Pa.	11,871				1					
Piqua, Ohio.	14,275	3								
Pittsburgh, Pa.	586,196		17		34		7		11	
Pittsfield, Mass.	39,678	5	2		3					
Pittston, Pa.	18,975								1	
Plattsburg, N. Y.	13,111	9								1
Plymouth, Mass.	14,061	3								
Pontiac, Mich.	18,006	11					1			
Port Chester, N. Y.	16,727	4	1		2				1	
Port Huron, Mich.	[1] 18,863	2								
Portland, Me.	64,720	28			3		2			1
Portland, Oreg.	308,399	49	4	1	14		1		2	1
Portsmouth, N. H.	11,730				1					
Portsmouth, Va.	40,693	20	1		1				3	
Pottstown, Pa.	16,987		1		1					
Providence, R. I.	259,895	46	15		10		3			4
Pueblo, Colo.	56,084	4			2				1	
Quincy, Mass.	39,022	8	1		5		2		2	
Racine, Wis.	47,465				1		4			
Rahway, N. J.	10,361	3							1	
Raleigh, N. C.	20,274	5								
Reading, Pa.	111,607		2							
Redlands, Calif.	14,573	5								1
Reno, Nev.	15,514	4								
Richmond, Ind.	25,080	8								1
Richmond, Va.	158,702	53	1				1		24	7
Riverside, Calif.	20,496	5			1				3	1
Roanoke, Va.	46,252	15					1		3	1
Rochester, N. Y.	264,714	62	22	1	3		4		30	4
Rockford, Ill.	56,739	15	1							
Rock Island, Ill.	29,452	1								
Rocky Mount, N. C.	12,673	4								
Rome, Ga.	15,607						2			
Rome, N. Y.	24,259				12					
Rutland, Vt.	15,038	7			6					
Sacramento, Calif.	68,984	20					1		3	3
St. Cloud, Minn.	12,013		5						1	
St. Joseph, Mo.	86,498	28	2				1			2
St. Louis, Mo.	768,650	170	25	1	5	1	6		48	9
St. Paul, Minn.	252,465	48	22	2	1		5		17	5
Salem, Mass.	49,346	8			1		2		2	2
Salem, Oreg.	21,274	3			1					1
Salt Lake City, Utah.	121,623	19	2		10					3
San Bernardino, Calif.	17,616	16								
San Diego, Calif.	56,412	20			2				7	1
Sandusky, Ohio.	20,226	8							4	1
Sanford, Me.	11,217	0					1			
San Francisco, Calif.	471,023	114	7	1	3		5		25	11
Santa Barbara, Calif.	15,360	1							3	
Santa Cruz, Calif.	15,150	8	2							
Saratoga Springs, N. Y.	13,839	5							1	
Saugus, Mass.	10,210						1			
Sault Ste. Marie, Mich.	14,130	2					1			
Savannah, Ga.	69,250	22							3	1
Scranton, Pa.	149,541		2		2					
Seattle, Wash.	366,445		6		2		3			
Sharon, Pa.	19,156				1					
Sheboygan, Wis.	28,907						4			
Sioux City, Iowa.	58,568		1							
Sioux Falls, S. Dak.	16,887	6								
Somerville, Mass.	88,618	12					2		5	
South Bend, Ind.	70,967	5					1		1	
Southbridge, Mass.	14,465	1			1					
Spokane, Wash.	157,656				1		1			

[1] Population April 15, 1910.

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

City Reports for Week Ended Aug. 7, 1920—Continued.

City.	Population as of July 1, 1917 (estimated by U. S. Census Bureau).	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Springfield, Ill	62,623	13					1			1
Springfield, Mass	108,688	25	1		3		7	2	2	
Springfield, Mo	41,169	15								2
Springfield, Ohio	52,296	14					4		4	2
Steubenville, Ohio	28,259	6								
Stillwater, Minn	[1] 10,198	2								
Superior, Wis	47,167	2					2			
Syracuse, N. Y	158,559	41			22	1			3	2
Tacoma, Wash	117,446		2				1			
Taunton, Mass	36,610	16	1						2	1
Terre Haute, Ind	67,361	16								
Toledo, Ohio	202,010	50	4		1		12		4	7
Topeka, Kans	49,538	6			5		3		1	
Trenton, N. J	113,974	48	3						4	5
Trinidad, Colo	14,413				1		1			
Troy, N. Y	78,094	22	3		2				3	2
Tucson, Ariz	17,324	14								3
Uniontown, Pa	21,600		2				1			
Vancouver, Wash	13,805		2							
Waco, Tex	34,015	10							1	
Waltham, Mass	31,011	5			1		2		2	
Washington, D. C	369,282	102	4		12		3		17	9
Waterbury, Conn	89,201						1			
Watertown, Mass	15,188	2							2	
Watertown, N. Y	30,404	0			1					
Wausau, Wis	19,666	5					1			
West Chester, Pa	13,403				2					
Westfield, Mass	18,769	3							1	
West Hoboken, N. J	44,386	3	1						2	
West New York, N. J	19,613	0			2					
West Orange, N. J	13,964	2	1		2				1	
Wheeling, W. Va	43,657	16			3		3		1	2
White Plains, N. Y	23,331	6							1	1
Wilkes-Barre, Pa	78,334		1		1		3		3	
Wilkinsburg, Pa	23,899		1		2		1		2	
Williamsport, Pa	34,123		3				5			
Wilmington, Del	95,369	18	1				2			
Wilmington, N. C	30,400	9								1
Winchester, Mass	10,812	2	1							1
Winston-Salem, N. C	33,136	11							2	
Winthrop, Mass	13,105	2					1			
Woburn, Mass	16,076	1								
Yakima, Wash	22,058				1		2			
Yonkers, N. Y	103,066	16	13		2		1		3	2
Youngstown, Ohio	112,282	28	2		2				2	
Zanesville, Ohio	31,320	9					1		2	

[1] Population Apr. 15, 1910.

FOREIGN AND INSULAR.

CUBA.

Communicable Diseases—Habana.

Communicable diseases have been notified at Habana as follows:

Disease.	Aug. 1–10.		Remaining under treatment Aug. 10, 1920.	Disease.	Aug. 1–10.		Remaining under treatment Aug. 10, 1920.
	New cases.	Deaths.			New cases.	Deaths.	
Cerebrospinal meningitis	.....	.....	2	Measles	24	.....	31
Leprosy	.....	.....	11	Paratyphoid fever	1	.....	1
Diphtheria	2	.....	2	Scarlet fever	4	.....	13
Malaria	42	.....	[1] 58	Smallpox	1	1	[2] 2
				Typhoid fever	26	4	[3] 106

[1] From the interior, 44. [2] From abroad, 2. [3] From the interior, 33.

SPAIN.

Meningitis—Madrid.

The following table gives the number of deaths from meningitis (all forms), by months, in Madrid, Spain, from January to June, 1920. The population of Madrid is stated to be about 624,000.

Month.	Deaths.	Month.	Deaths.
January	124	April	129
February	86	May	136
March	102	June	102

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

Reports Received During Week Ended Aug. 27, 1920.[1]

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
Brazil:				
Rio de Janeiro	June 27–July 3	.....	1	
China:				
Amoy	June 20–July 3	.....	3	
Hankow	July 4–17	12	5	Among soldiers.
India:				
Bombay	June 13–19	7	8	
Rangoon	June 6–19	5	3	
Japan:				
Kobe	June 28–July 18	119	70	
Do	Aug. 1–7	86	57	
Java:				
West Java—				
Batavia	June 4–17	.....	.....	Present.
Philippine Islands:				
Manila	June 27–July 3	2	.....	

[1] From medical officers of the Public Health Service, American consuls, and other sources.

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

Reports Received During Week Ended Aug. 27, 1920—Continued.

PLAGUE.

Place.	Date.	Cases.	Deaths.	Remarks.
China:				
Amoy	June 20–July 3		1	
Hongkong	June 27–July 10	12	10	
Greece:				
Cavalla	July 5–Aug. 21	3		
Nauplia	Aug. 21	2		
India:				
Bombay	June 13–19	62	49	
Karachi	June 20–July 3	5	5	
Madras Presidency	do	149	135	
Rangoon	June 13–19	19	15	
Java:				
East Java—				
Soerabaya	June 10–16	2	2	
Mexico:				
Tampico	Aug. 10–16		1	
Straits Settlements:				
Singapore	June 13–19	1	1	

SMALLPOX.

Algeria:				
Departments—				
Algiers	July 11–20	7		
Constantine	do	1		
Oran	do	23		
Brazil:				
Pernambuco	May 17–30	13	2	
Rio de Janeiro	May 23–June 26	20	4	
Do	June 27–July 10	12	1	
Bulgaria:				
Sofia	July 11–17	1		
Canada:				
Alberta—				
Calgary	Aug. 1–7	1		
New Brunswick	July 25–31			Cases, 11.
Campbelltown	July 1–31	7		
Ontario—				
Ottawa	June 27–July 3	5		
Do	Aug. 1–7	5		
Prescott	Aug. 8–14			Brockville, 2 cases.
Quebec—				
Montreal	Aug. 1–7	3		
Quebec	do	1		
Saskatchewan—				
Moosejaw	July 25–31	1		
China:				
Amoy	June 20–July 3		2	
Hongkong	June 27–July 10	1	1	
Chosen:				
Chemulpo	June 1–30	10	6	
Fusan	do	5	1	
Seoul	do	42	18	
Cuba:				
Matanzas	Aug. 1–7	12		In Aguacate.
Egypt:				
Alexandria	July 9–15	2	2	
Cairo	May 7–13	4	2	
Germany:				
Prussia—				
Danzig	June 27–July 17	8	2	
Great Britain:				
Glasgow	July 25–31	36	13	
Greece:				
Saloniki	June 28–July 18	1	4	From surrounding territory, 12 cases, 1 death.
India:				
Bombay	June 13–19	11	8	
Karachi	June 27–July 3	6	3	
Madras	do	4	1	
Rangoon	June 13–19	2	1	
Italy:				
Milan	May 1–31	2		

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

Reports Received During Week Ended Aug. 27, 1920—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Japan:				
Kobe	June 28-July 18	7	2	
Taiwan Island	June 21-July 10	10	8	
Java:				
West Java—				
Batavia	June 11-17	5	1	
Madeira:				
Funchal	July 18-24			Present.
Malta:				
Valetta	June 1-30	1		
Manchuria:				
Mukden	July 4-10			Prevalent.
Mexico:				
Ciudad Juarez	Aug. 2-8		1	
Tampico	July 1-31		5	
Spain:				
Barcelona	July 9-22		6	
Corunna	July 16-29		1	
Valencia	July 25-31			Present.
Tunis:				
Tunis	July 20-26		1	
Turkey:				
Constantinople	July 4-17	2		

TYPHUS FEVER.

Algeria:				
Departments—				
Algiers	July 11-20	5		
Constantine	do	1		
Oran	do	34		
China:				
Antung	July 12-18	1		
Chosen:				
Chemulpo	June 1-30	3		
Egypt:				
Alexandria	June 25-July 15	91	21	
Cairo	May 7-13	112	51	
Greece:				
Athens	June 27-July 3		2	
Drama	July 12-18	1		
Piræus	June 29-July 5		1	
Saloniki	June 28-July 18	70	16	
Java:				
East Java—				
Soerabaya	June 10-16	1		
Mexico:				
Nogales	Aug. 14	1		
San Luis Potosi	Aug. 2-8			Present.
Portugal:				
Oporto	June 13-24	4	2	
Spain:				
Barcelona	July 9-15		1	
Madrid	June 1-30		1	
Switzerland:				
Geneva	June 28-July 4	1		
Turkey:				
Constantinople	July 4-17	5		
Venezuela:				
Maracaibo	July 21-27		1	

YELLOW FEVER.

Guatemala:				
Los Amatos	Aug. 5-11	3	3	Aug. 17, reported present in other localities.
Mexico:				
Progreso	Aug. 1-14	10	2	
Tampico	Aug. 10-16		1	
Vera Cruz	Aug. 15-21	11	7	

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

Reports Received from June 26 to Aug. 20, 1920.

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
China:				
Chungking	May 16–22		551	
Do	June 6–July 3		2,173	
India				Apr. 11–May 8, 1920: Deaths, 5,612.
Bombay	May 2–June 12	76	37	
Calcutta	May 2–29	264	255	
Madras	June 13–19	2	1	
Rangoon	May 2–June 5	10	7	
Indo-China:				
Saigon	Apr. 26–May 16	56	41	Report for May 9 not received.
Do	June 7–13	74	53	
Japan:				
Kobe	June 8			Kobe, June 6–13, 34 cases. Moji, June 6–12, 10 cases. Kochi, June 6–12, 1 case. Hiroshima, June 6–12, 6 cases.
Do	June 14–27	36	24	
Nagasaki	June 21–27	7		
Do	June 28–July 18	34	13	
Osaka	do			
Taiwan Island	May 22–June 20	60	33	
Java:				
West Java—				
Batavia	Apr. 30–June 3	6	2	
Philippine Islands:				
Manila	May 9–15	1	1	
Do	June 6–26	4		
Provinces				May 9–June 5, 1920: Cases, 11; deaths, 9.
Albay	May 9–15	2	1	
Cagayan	May 9–June 5	9	8	
Do	June 13–26	2	1	
Laguna	June 20–26	1		
Rizal	June 13–19	1		
Union	June 13–26	2	2	
Russia				Reported prevalent in southern Russia, June 4, 1920.
Sebastopol (district)	June 20			Reported increasing.
Siam:				
Bangkok	Apr. 25–June 12	517	335	
Turkey:				
Amassia	Dec. 24	1		Asiatic Turkey.
Kaiseri	Dec. 22	1		Do.
Karassi	Jan. 3	1		Do.
Mamuret-ul-Aziz	Dec. 31	1	1	Do.
Panderma	Dec.–Jan.	16	6	
Rodosto	Dec. 29	1		European Turkey.
Smyrna	Dec. 22	3	2	Asiatic Turkey.

PLAGUE.

Brazil:				
Bahia	Apr. 25–May 22	8	2	
Pernambuco	May 3–9	1	1	
Porto Alegre	June 27–July 10		1	
British East Africa:				
Kisumu	Apr. 25–June 26	14	12	
Mombasa	Apr. 25–June 19	88	74	
Nairobi	do	14	8	
Ceylon:				
Colombo	May 25–June 12	7	2	
Chile:				
Antofagasta	May 17–June 20	5		
Do	July 5–11	1		
China:				
Hongkong	Apr. 4–June 26	90	70	
Egypt				Jan. 1–June 30, 1920: Cases, 303; deaths, 174.
Cities—				
Alexandria	June 18–July 8	6	3	
Suez	May 13–June 8	12	6	3 cases, pneumonic.
Provinces—				
Assiout	May 15–June 5	7	4	
Fayoum	June 5	1		
Garbieh	do	1		
Keneh	May 18	1		
Mariut	May 18–June 8	19	22	
Minieh	May 15	2	1	Septicemic.
Great Britain:				
Liverpool	June 20–26	1	1	

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

Reports Received from June 26 to Aug. 20, 1920—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Greece:				
Cavalla	July 22	1		
Do	July 29	1		
Dante	July 22	2		
Piræus	June 29–July 9	4		
India				Apr. 18–May 29, 1920: Cases, 9,639; deaths, 7,753.
Bombay	Apr. 18–June 12	85	70	Surrounding territory, June 6–12: Cases, 106; deaths, 61.
Calcutta	May 2–June 12	26	19	
Karachi	May 9–June 19	56	49	
Madras Presidency	May 9–June 26	234	181	
Rangoon	Apr. 25–June 12	87	82	
Indo-China:				
Saigon	May 10–16	1	1	
Do	June 7–13	8	1	
Italy:				
Catania	June 22–July 3	3	2	
Java:				
East Java	Apr. 23–May 5	7	7	Apr. 15–May 19, 1920: Cases, 6; deaths, 6, Surabaya Residency.
Mexico:				
Tampico	June 25–July 26	3	2	Total to date.
Vera Cruz	June 14–20	11	1	May 29–July 24, 1920: Cases, 49; deaths, 29.
Do	July 18–24	2	2	
Peru				Mar. 1–31, 1920: Cases, 46; deaths, 29. Apr. 1–30, 1920: Cases, 36; deaths, 13. In coastal departments.
Callao	Mar. 1–31	6	3	
Do	Apr. 1–30	9	4	
Lima (city)	Mar. 1–31	5	3	
Do	Apr. 1–30	4	4	
Lima (country)	Mar. 1–31	1	1	
Do	Apr. 1–30	1		
Mollendo	Mar. 1–31	13	9	
Paita	do	5	2	
Do	Apr. 1–30	2		
Salaverry	Mar. 1–31	4	3	
Do	Apr. 1–30	1		
San Pedro	do	6	1	
Trujillo	May 31–June 29	3	2	
Siam:				
Bangkok	Apr. 25–May 1	3	3	
Do	May 9–June 5	5	2	
Straits Settlements:				
Singapore	Apr. 25–June 12	13	12	
Syria:				
Beirut	June 30			Present.

SMALLPOX.

Algeria:				
Departments—				
Algiers	May 11–July 10	35		City of Algiers, Apr. 1–30, 1920: One case.
Constantine	June 1–July 10	10		
Oran	May 11–July 10	91		
Bolivia:				
La Paz	May 2–31	6	8	
Brazil:				
Bahia	Apr. 25–June 12	4	4	
Pernambuco	Mar. 29–May 2	57		
Do	May 10–16	9		
Rio de Janeiro	Apr. 11–22	10	2	
Santos	Mar. 24–28	1		
British East Africa:				
Mombasa	May 2–22	2	1	
Nairobi	May 23–June 19	10	1	
Canada:				
Alberta—				
Calgary	June 3–9	1		
Do	July 4–31	4		Patient taken from Vancouver train.
British Columbia—				
Vancouver	May 16–July 10	3		
Manitoba—				
Winnipeg	May 29–June 5	3		

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

Reports Received from June 26 to Aug. 20, 1920—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Canada—Continued.				
New Brunswick—				
Gloucester	May 31–June 26	5		
Nova Scotia—				
Halifax	July 4–10	2		
Sydney	May 31–June 26	2		
Ontario—				
Cornwall	June 25–30	2		
Fort William	July 25–31	1		
Hamilton	June 13–Aug. 7	3		
Kingston	May 31–June 19	4		
North Bay	June 23–29	1		
Do	July 11–17	2		
Do	July 25–31	2		
Ottawa	June 6–26	32		
Do	June 27–July 31	30		
Peterborough	Apr. 18–July 31	33		
Port Arthur	July 11–17	2	1	
Prescott	do	1		
Do	Aug. 1–7			Present at Cardinal.
Toronto	June 6–19	13		
Do	June 26–July 31	18		
Quebec—				
Montreal	June 13–19	1		
Do	July 4–10	1		
Quebec	June 27–July 3	1		
Saskatchewan—				
Moosejaw	June 26–30	1		
Regina	do	1		
Ceylon:				
Colombo	May 9–June 5	2		
Chile:				
Antofagasta	May 17–23			One case in interior.
China:				
Amoy	May 2–June 19		10	
Antung	May 9–June 13	3	3	
Do	June 21–27	1		
Chungking	May 2–June 5			Present.
Foochow	May 9–29			Do
Hankow	June 20–26	2		
Hongkong	Apr. 4–June 26	19	15	
Nanking	May 9–June 5			Do.
Do	July 4–10			Prevalent.
Tientsin	May 25–31	2		
Do	June 13–19	2		
Tsinanfu	May 9–15	1		
Chosen:				
Chemulpo	Mar. 1–31	22	23	
Do	Apr. 1–May 31	37	11	
Fusan	Mar. 1–31	7	2	
Do	Apr. 1–May 31	12	3	
Seoul	Mar. 1–31	120	45	
Do	Apr. 1–May 31	196	23	
Colombia:				
Barranquilla	May 16–July 3			Epidemic.
Santa Marta	May 31–July 17			Endemic.
Cuba:				
Habana	July 4	1		From steamship Frank Hennis, from Jamaica. Arrived Santiago June 30, 1920.
Czechoslovakia:				
Moravia	Feb. 1–28	68		
Danzig	June 20–26	1		
Egypt:				
Alexandria	May 14–June 24	52	19	
Do	June 25–July 8	7	1	
Cairo	Apr. 2–May 6	28	5	
Port Said	do	18	7	
France:				
Brest	May 15–21	1		
Cette	June 24–30		1	
Paris	May 1–10	3		
Germany				Feb. 22–Mar. 27, 1920: Cases, 373.
Great Britain:				
Glasgow	May 25–June 26	126	22	
Do	July 4–24	74	14	
London	June 13–July 10	14		

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

Reports Received from June 26 to Aug. 20, 1920—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Greece:				
Saloniki	May 31–June 27	4	1	
India				Apr. 11–May 8, 1920: Deaths, 5,520.
Bombay	Apr. 26–June 12	87	35	May 9–15, 1920: Cases, 26; deaths, 11.
Calcutta	May 2–29	96	88	
Karachi	May 9–June 26	15	12	
Madras	do	27	15	
Rangoon	Apr. 25–June 12	31	13	
Indo-China:				
Saigon	May 10–16	7	2	
Do	June 7–13	5	1	
Italy:				
Genoa	May 17–23	12		In Province.
Do	June 14–20	15		
Messina	May 10–June 27	7	1	Province, May 10–June 27: Cases, 168; deaths, 27.
Do	June 28–July 11	1	1	Province—Cases 9; deaths, 3.
Milan	Mar. 1–Apr. 30	29	5	
Naples	May 23–June 20	7	3	
Palermo	May 11–July 15	23	3	
Turin	June 28–July 4	1		
Jamaica:				
Kingston	July 22			Present.
Japan:				
Kobe	May 9–June 6	7	2	
Do	June 14–27	3	3	
Taiwan Island	May 1–June 20	40	11	
Tokyo	Apr. 21–May 10	5	4	
Java:				
West Java				Apr. 16–May 5, 1920: Cases, 53; deaths, 10.
Batavia	Apr. 16–June 10	89	25	
Madeira:				
Funchal	June 20–26		2	
Malta	May 1–June 15	2		
Manchuria:				
Mukden	May 2–8			Present.
Mexico:				
Guadalajara	May 1–31	1		
Laredo	July 30	2		
Mazatlan	May 19–25		1	
Salina Cruz	June 1–30	5	3	
San Luis Potosi	May 31–June 6		1	
Do	June 28–July 11		3	
Do	July 19–25		2	
Newfoundland:				
St. Johns	June 5–11	3		Reported at 2 other localities.
Shoal Harbor	July 10–16	7		July 3–16: Present at 4 localities.
Portugal:				
Lisbon	May 16–June 28		8	
Russia:				
Vladivostok	Jan. 1–Apr. 30	248	77	
Spain:				
Barcelona	May 19–June 12		4	
Do	June 18–July 8	6	1	
Valencia	May 23–June 26	15	3	
Do	July 4–24	9	2	
Vigo	May 31–June 26		4	
Do	July 18–24		1	
Switzerland:				
Geneva	May 9–15	7		
Tunis:				
Tunis	May 25–July 19	24	16	
Turkey:				
Constantinople	May 16–June 19	7		
Do	June 20–July 3	4		

TYPHUS FEVER.

Algeria:				
Departments—				
Algiers	May 11–July 10	32		
Constantine	May 21–July 10	8		
Oran	May 11–July 10	288		
Austria				Feb. 15–Mar. 15, 1920: Cases, 60.
Vienna	Feb. 15–Mar. 15	20		

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

Reports Received from June 26 to Aug. 20, 1920—Continued.

TYPHUS FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Bolivia:				
La Paz	May 2-31		5	
Brazil:				
Ceara	Apr. 25-May 1		2	
Bulgaria:				
Sofia	June 20-25	2		
Chile:				
Antofagasta	July 5-11			Present.
Caleta Coloso	May 10-16		2	
Concepcion	Mar. 8-June 19		37	
Valparaiso	May 2-July 17		50	
Chosen:				
Seoul	Mar. 1-Apr. 30	4	1	
Czecholovakia:				
Leipnik	Feb. 22-28	1		Quarantine station.
Danzig	June 20-26	1		
Egypt:				
Alexandria	May 7-June 24	338	86	
Cairo	Apr. 2-May 6	492	165	
Port Said	Apr. 9-May 6		1	
Germany				Feb. 22-Mar. 27, 1920: Cases, 23. Among troops, 4; among persons from Poland, 8.
Great Britain:				
Dublin	May 23-June 19	3	1	
Dundee	July 4-10	1		
Glasgow	May 30-June 5		1	
Greece:				
Saloniki	Apr. 12-June 27	384	42	
Hungary				Jan. 19-Feb. 29, 1920: Cases, 14.
Budapest	Jan. 10-Feb. 29	7		
Italy:				
Catania	July 10-17	3		
Trieste	May 16-22	5		
Do	June 13-July 3	12	2	
Japan:				
Nagasaki	May 25-30	1		
Do	June 21-27	1		
Java:				
West Java—				
Batavia	May 28-June 30	5	1	
Mexico:				
Chihuahua	May 31-June 6		1	
Nogales	Aug. 9	1		
San Luis Potosi	June 8-July 4			Present.
Do	July 2-Aug. 1		1	
Portugal:				
Oporto	Apr. 4-June 12	11	4	
Siberia:				
Vladivostok	May 1-31	22	2	Jan. 1-Apr. 30, 1920: Cases, 1,264; deaths, 144.
Tunis:				
Tunis	May 24-June 27	36	18	
Do	July 6-12		1	
Turkey:				
Constantinople	May 16-June 12	27		
Do	June 19-July 19	10		

YELLOW FEVER.

Brazil:				
Bahia	May 23-June 19	1		
Colombia:				
Buenaventura	June 3	1	1	
Mexico:				
Progreso	Reported July 30	1		Confirmed.
Do	Reported Aug. 4	3	2	
Vera Cruz	June 22		2	
Do	July 19-Aug. 14	26	12	
Peru				Mar. 1-31, 1920: Cases, 128. Apr. 1-30, 1920: Cases, 64.
Callao	Apr. 1-30	1		At quarantine station. From S. S. Huallaga.
Catacaos	Mar. 1-31	14		
Do	Apr. 1-30	2		

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

Reports Received from June 26 to Aug. 20, 1920—Continued.

YELLOW FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Peru—Continued.				
La Huaca	Mar. 1-31	9		
Do	Apr. 1-30	5		
Morropon	do	37		
Munuella	Mar. 1-31	12		
Paita	do	81		
Do	Apr. 1-30	14		
Piura	Mar. 1-31	1		
Do	Apr. 1-30	4		
Salitral	Mar. 1-31	2		
Sullana	do	9		
Do	Apr. 1-30	1		
Salvador:				
Armenia	June 20-26	1	1	
Sonsonate	May 22-June 24	49	17	