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THE WILMINGTON (N. C.) WATER SUPPLY.

AN INVESTIGATION MADE DURING NOVEMBER AND DECEMBER, 1913.

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The investigations reported herewith were made by the writer under instructions from the Surgeon General of the United States Public Health Service. The work was done in response to requests received from the secretary of the State Board of Health of North Carolina and from the mayor of the city of Wilmington.

To supplement the information derived from personal interviews and from charts, maps, and data previously collected by others and referred to at the end of this report, a careful inspection has been made of the city waterworks and waters of both branches of the Cape Fear River in front of the city and up to points that are well above the effect of pollution from the city. The location of sewer outlets existing at present and as contemplated in the future extension of the sewer system and plans of the projected system have been given careful study. Samples of water from the present waterworks intake and from both branches of the river at points above the effect of Wilmington's pollution have been taken and submitted to special study, and some specimens of these waters have been sent to the Washington Laboratory for more detailed study.

From the information that has been derived from all these sources the following statement of facts and of opinion derivable from these facts is presented.

The Present Water Supply.

THE CAPE FEAR RIVER.

The Cape Fear River proper is formed by the junction at the city of Wilmington of two branches known, respectively, as the Northeast and Northwest Branch of the Cape Fear River. The Northeast Branch has a comparatively flat grade and drains a portion of country which is characterized by low swamp land, so that a large proportion of the run-off of the stream is a characteristic swamp water. The stream is therefore characterized by a

high color and organic stain and apparent freedom from suspended matter or turbidity. The water is soft and faintly alkaline in reaction and except for the undesirable appearance of such a highly colored water it is admirably adapted for domestic uses. The Northwest Branch, on the other hand, drains a region characterized by rolling country and hills, and its run-off is largely composed of surface waters carrying with them the usual heavy turbidity and sediment common to southern rivers. It is almost free from organic coloring matter and is also relatively soft, so that except for the unsightly appearance and general undesirability of the suspended mineral matter it also would constitute an ideal domestic supply.

POLLUTION.

The present waterworks intake is located on the Northeast Branch, about 1 mile above the junction of the two branches and about 1½ miles above the center of population of the city. The sewers of the city discharge into the river at various points along the water front and a considerable portion of the eastern section of the city drains by sewers to a tributary of Smiths Creek, which latter enters the Northeast Branch at a point shortly above the present waterworks intake.

Tidal currents attain a maximum velocity of approximately 1 mile per hour and run to the north for five hours on each flood tide. A careful study of the best available data on this question leads to the conclusion that some of the water which passes the present intake during the flood tide has come from a point at least 3 miles below, so that there can be little question that the Wilmington water supply is definitely polluted by the sewage of the city. On the ebb the polluted waters of Smiths Creek flow by the intake. The dilution of polluting matter, however, is very great, owing in part to the large volume of the Northwest Branch. A distinct improvement in conditions will also follow the removal of the sewage from Smiths Creek by the interceptor which has just been completed and from which sewage will be pumped over the ridge and discharged at a point south of the intake.

Bacteriological examinations of the raw water at the intake furnish evidences of the degree of dilution available. The average bacteriological content of the raw water for two years has been about 2,500 bacteria per cubic centimeter and the organism *B. coli* has been fairly consistently present in 1 cubic centimeter. Judged by ordinary standards for river waters this pollution is not serious. Many cities of the United States, such as Lawrence, Mass., Albany, N. Y., and Philadelphia, Pa., are purifying waters that are more grossly polluted. It should be pointed out, however, that the pollution in the present instance is exceedingly fresh and that bacterial

evidences of such pollution has a much greater significance in these circumstances than it has in a stream that has a much greater period of self-purification. It is known that pathogenic organisms do not persist as long under the average conditions found in streams as do the normal sewage bacteria. It is therefore evident that the longer the time that has elapsed between the point of pollution and point of intake the less significant the ordinary bacterial evidence of pollution. On the whole, however, it may be safely asserted that the water of the East Branch of the Cape Fear River, although distinctly polluted by the sewage of Wilmington, is a suitable water for purification and is undoubtedly superior to waters that are in use by many cities throughout the United States.

PURIFICATION PLANT.

The water supply pumped from the east branch of the Cape Fear River is purified by what is known as the process of mechanical filtration. For this purpose sulphate of aluminum and carbonate of sodium are added to the water which is then passed through sedimentation basins. The precipitated hydrate of aluminum has the property of gathering together all finely divided suspended material, including the bacteria, and also of absorbing in part the dissolved color of the water. For the complete removal of such color either a considerable amount of alumina must be provided or a long time of contact—at least 24 hours—is necessary. After this chemical treatment the water is passed through filters which remove any portion of the aluminum hydrate that passed the sedimentation basins giving, under ordinary working conditions, a water that is essentially free from bacteria and from other suspended material and has been deprived of a considerable proportion of its color.

The Wilmington plant is being operated under conditions which do not make for best results. At the time of its original design the difficulty of treating such a highly colored water was probably not fully realized, and those responsible for additions to the plant have not taken advantage of our increased knowledge in this subject. In order to deal efficiently and economically with a water of this character, a longer period of contact with the coagulant is quite essential. At the present average rate of pumping of something over 2,000,000 gallons per day the water will pass either set of coagulating basins in about 4 hours. As the rate of pumping is very much increased during the day and correspondingly cut down during the night, the majority of water used passes through the tanks in a much shorter period. The velocities through these tanks are too great to permit proper sedimentation and the time of contact with the coagulant is entirely too brief. The changes which are now under way will permit the use of both sets of tanks in series and will double the time of

contact but will not increase the time of passing. A distinct improvement will follow this change, but if possible the pumping connection should be so arranged that the two sets of tanks can be used in parallel, each taking one-half of the total amount of water, thus diminishing the velocity and permitting better sedimentation.

The filters themselves are said to have been allowed to deteriorate during the summer, but they have now been provided with new sand and are apparently giving satisfactory results. It is probably true, although definite information upon this point is lacking, that an excessive amount of wash water is being used. It is impossible to measure the amount of wash water used, and this conclusion is based upon the appearance of an excessive amount of coagulant passing to the filters from the sedimentation basins. It is highly desirable that means be provided for measuring the amount of wash water used and especially for measuring the total amount of water pumped. In no other way can the application of chemicals be properly adjusted.

CHLORINATION.

The work of the filters is supplemented by the application of chlorine gas, a powerful disinfectant. The apparatus that has been installed is a modern and thoroughly satisfactory one and when properly operated should leave no possible question of the hygienic quality of the water. During the summer this apparatus was insufficient in capacity to care for the total quantity of water pumped. This defect was remedied and satisfactory results followed immediately.

CHARACTER OF THE PURIFIED WATER.

Samples of the purified water are sent to the State laboratory once each month and a daily test is made at the plant by the director of the laboratory. During the first half year of 1911 the regular examinations of samples taken at the filter indicated the absence of *B. coli*, the test organism for pollution, although the general bacterial content of the water was not highly satisfactory. Some special samples collected on May 30 and 31 and June 1 and 2 showed *B. coli* present in all cases and in the majority of cases in 1 cubic centimeter. The fact is to be noted, however, that these samples were taken from various taps in the city and it has been stated that at the time a considerable amount of new water pipes had just been installed. This statement has not been further investigated, but may explain in part the results obtained. After July, 1911, and until May, 1913, the bacterial results reported from the State laboratory were satisfactory, *B. coli* being uniformly absent from 10 cubic centimeter quantities. The results obtained at the plant are in conformity with those obtained at the State laboratory. *B. coli* appeared in 10 cubic

centimeters in May, 1913, and the water gradually deteriorated during that summer, as shown by both local and State analyses. The reasons for this deterioration have already been alluded to. The imperfections have now been remedied and recent analyses indicate the satisfactory operation of the plant and a safe water. The chemist and bacteriologist in charge of the sanitary operation of the plant is a competent man and if he is given proper support there is no reason why the present purification works should not be relied upon to produce a thoroughly safe and satisfactory water.

OBJECTIONS TO THE PRESENT WATER SUPPLY.

Despite the assurances that have just been given, there are certain objections to a water supply of this character which should have weight in any discussion of the whole water-supply question.

Danger of infection.—A filter plant, however perfect, is never an absolute guaranty of protection against a polluted water supply. In Lawrence, Mass., in 1899, a rather serious outbreak of typhoid fever resulted from the accidental failure of the water plant, and at Watertown, Me., Philadelphia, and other places serious results have followed similar breakdowns. It can not be denied that the use of a polluted water is always attended with a certain moment of danger, and every effort should be put forth to secure as pure a water supply as is reasonable and feasible.

Esthetic objection.—A modern water filter can produce under normal conditions of operation a water that is perfect from a hygienic standpoint; still there is a perfectly reasonable objection on the part of many to the use of a water with a known history of pollution. However unreasonable such views may appear to those who believe otherwise, they may be of real importance in the general discussion of the problem. In the first place, such esthetic objections, whether or not they are well founded, lead naturally to the use of other waters, and in many cases to waters of far less hygienic purity than the city supply. It may be further urged that the objectors have a reasonable right to be consulted as to the quality of water that they shall pay for, and that due weight shall be given to their opinions and desires. There seems to be a very strong feeling against the water supply of Wilmington in this regard. This feeling is freely and forcibly expressed, and it is a matter which is likely to increase rather than decrease. It at least furnishes an additional and strong argument for a water supply of greater initial purity, quite regardless of the filter plant, to render the city water perfectly satisfactory.

Use of aluminum sulphate.—A third and quite serious objection to the present supply is the rather large quantity of sulphate of aluminum that is necessary. While under proper conditions this compound is entirely changed in the coagulating basin and the

aluminum hydrate is completely removed, either in the basin or upon the filter, there does result from the application of the two coagulating chemicals a perfectly harmless substance in the water which increases its corrosive properties. This increase of salinity is responsible for the rapid deterioration of lead and copper flush tanks and other metal fixtures, many instances of which have been reported and commented upon. It is also responsible to a considerable degree for the rusty water that is commonly encountered, especially in the hot-water services.

SUMMARY ON PRESENT SUPPLY.

In brief summary it may be stated that the present water supply comes from a moderately polluted source, but can under normal working conditions be rendered perfectly safe and satisfactory from a hygienic standpoint. There is, however, a slight danger of failure on the part of some of the purification mechanism and it is obvious that the plant must be run at all times at its highest possible efficiency and under intelligent and harmonious cooperation among those in authority. There is in addition a considerable amount of organic stain which is difficult to remove and which requires the application of more sulphate of aluminum than would otherwise be called for. On these accounts it is desirable to consider the feasibility of other sources of supply, giving due weight to their respective cost and the amount and quality of water which may reasonably be expected of each.

Deep Wells.

GENERAL DISCUSSION.

The deep-well situation in Wilmington and general vicinity has been rather thoroughly investigated. There appear to be several underlying water-bearing strata. Near the surface there is the surface water such as is found in shallow wells and which requires no further consideration. At depths varying from 100 to 300 feet there exists the Eocene limestone formation within and beneath which there seems to be an available supply of water. The Report of the North Carolina Geological and Economic Survey, Volume III, 1912, prepared by Joseph Hyde Pratt, State geologist, in collaboration with workers from the United States Geological Survey, describes in some detail the underground formation in the vicinity of Wilmington and gives valuable information on the subject of deep ground waters. The matter has also been treated quite extensively by Myron L. Fuller, at that time geologist of the United States Geological Survey, in a paper presented before the American Water Works Association in 1908. It appears that the water-bearing strata of the Coastal Plain region slope gently from the basement

granite outcrop which traverses the State in a northeasterly line from the region of Anson County on the south to Warren County on the north. These water-bearing strata, which outcrop at various distances to the southeast of the granite formation, slope toward the sea, so that in the vicinity of Wilmington the Eocene limestone and underlying calcareous sand, all of which are water bearing, are located from 100 to 300 feet below the surface. The water which they bear comes originally from the rainfall on the catchment areas to the east of the granitic outcrop alluded to.

QUANTITY OF WATER AVAILABLE.

The reports alluded to indicate in general an abundant supply of ground waters in the Eocene formation. It is further evident, however, that this formation is irregular and is often encountered at isolated patches, so that the available catchment area in any given case is a somewhat uncertain factor.

The personal experience of Mr. W. E. Worth is of interest in this connection. A new well put down within 200 feet of a well which was giving a copious supply failed to tap water-bearing strata.

In a personal letter addressed to the city chemist, Mr. Pratt, State geologist, states:

Those strata that are reached by wells 100 to 300 feet deep offer the possibility of a water supply. These wells may not be in the immediate vicinity of Wilmington, but may be some distance from it. I do not believe that anyone can state definitely at the present time whether or not water in sufficient quantity can be obtained from such wells to supply the city of Wilmington, not only for the present but for the next 20 years.

Mr. Pratt further shows his lack of confidence in the possibilities of deep wells by suggesting that if a pure-water supply can not be obtained from other sources the question of deep wells should be considered.

So far as I have been able to obtain the facts concerning certain wells that are now in use in Wilmington, there seems to have been no difficulty except in the one case alluded to in obtaining wells with an abundant supply for private use.

SANITARY CHARACTERISTICS.

Out of 70 examinations made by the State board of health of the water of deep wells in Wilmington, 17, or approximately 24 per cent, gave definite evidence of pollution. It is true that this evidence is not of great weight since it may very possibly represent imperfect casing or some accidental pollution, but in certain cases even this explanation fails to account for the facts. This is especially true in the case of a well put down by the Wilmington Ice & Storage Co. at Front and Dock Streets. This well gave a satisfactory analysis

at the time it was put down, but on continued pumping developed marked traces of pollution together with an excess salinity which has precluded its use.

The question of hygienic purity of well waters is, therefore, somewhat indefinite. It seems quite probable that these waters tap limestone beds in which are contained definite open channels and cavities of various sizes largely intercommunicating. Evidence of this view is the effect of new borings in increasing the turbidity of wells at quite distant points. It is not at all unlikely that these waters are also in communication at certain places with the waters of the upper strata and that continued use on a large scale of these deep-well waters would lead to a gradually increasing pollution. This, however, is merely conjecture, and it can only be stated at this time that data upon which to base any definite conclusion of the permanent sanitary purity of the deep-well waters from this region are entirely lacking and can not of course be obtained by any means less expensive than the actual installation and long-continued trial of deep wells operated under the severe conditions of municipal service.

CHEMICAL CHARACTERISTICS.

These well waters are also high in alkalinity, or, as it is commonly called, temporary hardness. The analyses that are available show alkalinities ranging from 75 to 250 parts per million. While this degree of alkalinity has no hygienic significance, it is a distinctly undesirable characteristic in a water for domestic use, and upon a purely esthetic basis is certainly less desirable than the slight amount of organic color which remains in the present water after purification. The household use of such waters would result in a very material expense each year from excess soap requirement, and the people of Wilmington, being accustomed to the use of an extremely soft water, would without doubt raise very pertinent objection to a water having several times the hardness of the Washington City supply, doubtless familiar to many of them.

Industrially, alkalinity is a much more serious matter, and well waters of the character of those which have been examined would be quite useless for boiler purposes or for industrial laundries. The case of one local laundry was brought to my attention. It is stated that an attempt to use a deep-well supply was abandoned owing to the excessive amount of soap required.

The amount of iron noted in certain of the analyses reported by the State geological survey suggests the possibility of another serious impurity which should not be overlooked. An excessively high iron content is highly undesirable and in many places necessitates expensive purification methods.

SUMMARY ON WELL PROJECT.

The deep-well project is seen to be characterized mainly by lack of definite information. There is a distinct element of doubt as to the possibility of securing a sufficient supply that will continue year after year. There is even more serious doubt as to the hygienic quality of the water thus obtained. Even though pure water may be obtained under conditions of moderate draft it is not at all certain that the severe duty entailed by the necessities of a municipal supply will not develop communicating channels with the polluted waters of the upper strata. The facts that are definitely known are all against the deep-well supply. The water would be exceedingly hard, highly undesirable for domestic use on account of its excessive soap consumption and great inconvenience associated with the use of a hard water, and it would be totally unfit for laundry and industrial uses. On the whole, therefore, the deep-well project is one which may be well held in reserve until all other possibilities have been properly investigated and shown to be even less favorable.

Alternative Projects.

Fortunately the city of Wilmington is not compelled to make the experiment in deep wells at this time. The present situation is not at all intolerable, and with careful management the demand for immediate relief is not great. There are certain methods which may be properly investigated with a view to overcoming the more serious objections to the present supply which have been discussed under the headings, "Danger of infection, esthetic objections, and use of sulphate of aluminum." The removal of the present intake to some more satisfactory location naturally suggests itself.

NEW INTAKE ON THE NORTHEAST BRANCH.

It has been suggested that the intake might with advantage be located at a point considerably upstream on the Northeast Branch. It would not be difficult to find such a point where immediate pollution from the sewage of the city would be entirely eliminated. This would bring partial relief from two of the objections noted. There would be no danger from pollution and the esthetic objection against the use of a water showing a history of pollution would be removed. It should be pointed out, however, that the water supply is to a considerable extent a mixture of both branches of the river. Samples taken from the Northeast Branch above the influence of the Northwest Branch and also of the city's sewage showed a much deeper color than the present city supply. The difficulties of color removal would be very much greater at this point and the final product of the filter would necessarily be more highly colored than is the present supply.

Only by increasing the dosage of aluminum sulphate could this difficulty be obviated. The objection to the use of a coagulant would then be greater than at present. It has also been suggested to cross the country with an intake line to a point above the town of Castle Hayne. This project offers no apparent advantages over the removal of the intake 3 or 4 miles upstream and has all the disadvantages that have been pointed out.

NEW INTAKE ON THE NORTHWEST BRANCH.

It has already been shown that the waters of the Northwest Branch are very different in general characteristics from those that are now being used. The principal branch of this stream comes from mountainous country. There is one tributary, the South River, draining low land and undoubtedly contributing some of the color to the water. The normal clay turbidity carried by the Northwest Branch counteracts this color, and samples from this river shipped to Washington show a color less than one-tenth that shown by the Northeast Branch. An intake force main, running directly across from the present pumping station, following the railroad right of way, would tap a small branch canal at a distance of about 2 miles from the pumping station. This canal enters the Northwest Branch at a point 4 miles above Point Peter, and the upper end of the canal again joins the river at a point 7 miles above Point Peter. With a tidal flow reaching a maximum of 1 mile per hour and running up for five hours during each tide, little, if any, of the waters from below Point Peter would ever reach the lower end of this canal. Moreover, it would be an exceedingly simple matter to provide this canal with tidal gates, so that the flood flow could be entirely eliminated. In this way the water received at the intake would come from the Northwest Branch well above any possibility of pollution. The long sluggish canal would also serve as an efficient sedimentation basin and would greatly relieve the work of the filter.

A small pumping station, electrically operated and controlled from the main pumping station, could easily be maintained at the end of the intake line. This line could be laid along the surface of the ground, preferably along the railroad right of way, at a very small cost. The only expensive feature of the project is a siphon under the Northeast Branch. The channel at this point, however, is constricted by the drawbridge, and the deep portion of the siphon would be greatly shortened.

ADVANTAGES OF THIS NORTHWEST BRANCH PROJECT.

This project meets quite satisfactorily all the objections that have been urged against the present supply. It removes, totally, the hygienic and esthetic objections to a polluted water, and experience

with waters of a similar type that are being treated elsewhere, coupled with laboratory investigations that have been made in Washington upon samples of this water, indicate that the dosage of aluminum sulphate required for its proper treatment would be less than one-half that now employed. This would reduce to a negligible minimum the corrosive properties of the water that are now observed.

In the matter of cost this project is probably the most economical one in the long run that has been suggested. It will probably be shown upon further study that the saving in chemical will offset to a large extent, if not entirely, the additional capital charge. The project offers the advantage of utilizing all the existing works and represents a merely normal growth of the present water-supply system rather than a complete abandonment of a large and expensive portion of that system. This growth is in the line of progress and is in the direction taken by many other cities that have from time to time abandoned deep-well projects to seek a pure river supply.

Finally it is a project that is capable of exact engineering studies and that can be undertaken with a full knowledge of the exact cost and exact advantages to be obtained. It offers, even with our present incomplete knowledge, evidence of an abundant supply that will undoubtedly remain pure for a very long time in the future, and one whose purification involves no uncertain or difficult methods.

Conclusions and Recommendations.

As a result of a careful study of the present water supply of Wilmington and the possibilities of a deep-well supply and of other river supplies, the deep-well project has been found to involve many elements of uncertainty and to be definitely lacking in that it would supply an undesirably hard water and the continued use of the river water is strongly recommended.

The present water supply as it is now operated is, on the whole, quite satisfactory. Every effort should be made to maintain the purification plant at the highest possible degree of efficiency, and to this end certain changes seem imperatively necessary. The suggestion of communicating channels between the old and new sets of filters made by the chief engineer, Mr. John H. Sweeney, is an excellent one and should be adopted. This will make it possible to utilize for the first time the entire filter capacity of the plant. The connections which are being made between the two sets of settling basins will also prove of great benefit. It would be still more advantageous if piping connections with the pumps could be so arranged that these two sets of basins could be used in parallel as well as in tandem. This would not only give the maximum time for coagulation, but would allow the minimum horizontal velocity of flow through each basin, thus permitting the most efficient sedimentation of coagulant

and permitting saving in wash water. The force main and wash water lines should be equipped with properly constructed Venturi meters. It is impossible to properly control the operation of a plant of this type without definite knowledge at all times of the amount of water being used. The meters on the wash lines constitute invaluable checks upon the amount of water used for this purpose and will result in great economies.

If the present source of supply is to be continued, larger coagulating basins will be found to be necessary to secure proper color removal without the use of an excessive dose of aluminum sulphate. At least 12 hours' storage capacity should be provided. If, on the other hand, the Northwest Branch project is to be adopted in the near future, it is not deemed advisable at this time to enlarge the coagulating basins. Further study of the latter project will doubtless indicate that the basins have at present sufficient capacity for the treatment of that water.

The foregoing recommendations should be acted upon at once in the interest of the health of the community and are irrespective of any action that may be taken upon other projects. Whether deep wells or a new intake are to be investigated, the present plant requires this minimum of attention to safeguard the public health. It is believed that these steps are sufficient to properly safeguard health and that other considerations are merely matters of personal preference or possibly of economy. It must be admitted, however, that the objections to the present system even under its most efficient management are very real, and that if the people of Wilmington desire and can afford better water supply it is their right and privilege to be heard in this matter.

Of the various alternative projects that have been considered the extension of the intake on the Northwest Branch of the Cape Fear River is by far the most promising. It is recommended that the necessary engineering studies involving the cost of the East Branch siphon, the 2 miles of pipe line, and the low-lift pumping station be undertaken at once. There are no serious engineering problems involved here and the necessary engineering studies can be made without unreasonable expense. At the same time it is recommended that chemical and bacteriological studies of the water of the canal alluded to, be undertaken. These should be made with the object of determining the general chemical characteristics of the water and the possibilities of its chemical treatment; the hygienic characteristics of the water with special reference to determining whether or not any pollution from Wilmington reaches this point; and, finally, what saving in chemicals, sulphate of aluminum, soda ash, and chlorine would be indicated by the use of this water. If, as I anticipate, the

saving in cost represents a very considerable part of the investment, the project would certainly seem to be one worthy of consideration. In any event, it is but proper to place before the citizens of Wilmington a definite statement of the advantages that are possible and the cost of obtaining those advantages over the present cost of water, in order that the final outcome may be decided after a full and frank discussion and upon an impartial presentation of all the facts in the case.

Acknowledgments.

The writer wishes, in conclusion, to express his grateful appreciation to Dr. W. S. Rankin, secretary, and to Mr. Warren H. Booker, engineer, of the State board of health, for valuable personal information and various reports, laboratory results, and other documentary material placed at his disposal; to the Hon. Parker Quince Moore, mayor of the city of Wilmington; to Martin S. Willard, chairman of the board of health, and to Councilman Wood and Supt. Merritt, city water department, for many courtesies extended and especially for opportunities offered to meet representative citizens of Wilmington; to Dr. Charles T. Nesbit, superintendent of health, for much valuable information carefully compiled for my study and also for having placed at my disposal the complete records of the board of health; and to George F. Catlett, city chemist and director of the laboratory, who has given me every possible assistance in arriving at a knowledge of the facts and whose personal efforts to simplify the duties involving upon me by the compilation of statistical data and analyses greatly reduced the labors of this investigation.

Consultations were had with Dr. W. S. Rankin, secretary of the State board of health, and with Mr. Warren H. Booker, engineer of the board; Hon. Parker Quince Moore, mayor of the city of Wilmington; Martin S. Willard and Charles T. Nesbit, M. D., chairman and superintendent, respectively, of the city and county boards of health; Councilman Wood; Supt. Merritt, of the water department; City Chemist Catlett; and with a number of citizens of Wilmington having special knowledge of, or interest in, the local water-supply question.

The following descriptive and statistical data have also been placed at my disposal and have been given careful study: Map of the city of Wilmington, prepared by Mr. H. DeW. Rapalje, consulting engineer; report on the examination of sanitary conditions at Wilmington, prepared by Warren H. Booker, June, 1911, embodying also reports of Messrs. Lucas, Humphries, and Rapalje on the sewerage system of Wilmington, and of George T. Hammond, consulting engineer of New York City, on the same subject; report on a water-

borne epidemic of typhoid fever in Wilmington, prepared by Dr. W. S. Rankin, July, 1911; report of George C. Whipple on the water supply of Wilmington, dated December, 1911; chart prepared by Charles T. Nesbit, M. D., superintendent of health, showing the chronological incidence of typhoid fever in Wilmington during the months of June, July, and August, 1911, and the distribution of cases during this period with respect to water supply and milk supply; a further chart on file at the office of the board of health showing the geographical distribution of cases during this same period and statistical tables showing the racial distribution; report of George F. Catlett, director of the board of health laboratory, dated October, 1913, giving a detailed account of the present city water supply with a history of the various studies that have been made in connection with this supply, comparative statistics from other cities, and a full discussion of the events and conditions which made it seem necessary to advise the public on June 1, 1913, that the public water could not be safely used without boiling; a supplementary report by Mr. Catlett, dated November 29, 1913, giving a detailed summary of the monthly tests on the Wilmington water made by the State laboratory during the years of 1911, 1912, and 1913 to date, and monthly summaries of daily tests made at the city laboratory from March, 1912, to date on both the untreated river water and the filter effluent; some seventy analyses of deep wells in Wilmington made by the State board of health during the years of 1911, 1912, and 1913; fifty-six additional analyses made by George F. Catlett of deep-well water in and about Wilmington during the years 1912 and 1913, giving more complete information on the mineral constituents of these well waters; results of tests on river currents, report of Messrs. Hazlehurst and Anderson, under date of February 2, 1911; log of deep-well boring made for the Clarendon Water Works Co. at its pumping station on the east bank of the Cape Fear River in 1898, 1899, the log being the results of examinations at each 10-foot depth made by Mr. George H. Sweeney, chief engineer of the Wilmington waterworks; letters from J. A. Holmes, United States Bureau of Mines, formerly State geologist of North Carolina, dealing with the question of deep wells; letters from Joseph Hyde Pratt, Ph. D., State geologist of North Carolina, dealing with the same subject; report of the geological and economic survey, Volume III, 1912, on the Coastal Plain of North Carolina; report of Myron Fuller to the American Water Works Association, 1908, on the waters of the Atlantic Coastal Plain, and a memorandum submitted by Mr. A. N. Dubois, Wilmington, showing the results of the treatment of Cape Fear River waters by a special process, the details of which are not shown.

EXPERIMENTAL INSECT TRANSMISSION OF ANTHRAX.

By M. BRUEN MITZMAIN, Veterinary Entomologist, Government of the Philippines.

Only a very few clearly defined instances have been recorded of any experimental evidence demonstrating the rôle of suctorial insects in the dissemination of anthrax. It was with this in view that the writer investigated the purely entomological aspects of the anthrax problem. The question of contamination through skin abrasions produced by insects other than the blood-sucking forms is not at present considered.

This preliminary note is the culmination of a great number of experiments attempted. Only the three positive ones are cited in detail. The difficulty presented is essentially in that the problem of anthrax dissemination is not significant for the suctorial insect until the peripheral circulation becomes invaded with tremendous numbers of the anthrax bacterium. In the first trials the blood donors were employed 24 hours to 3 days prior to their death, and although characteristic cultures were obtained from blood drawn from the ear upon these occasions, no transfer of infection through fly biting resulted in the many experiments attempted.

Only negative results were obtained when it was aimed to demonstrate the possibility of biting fly transmission with animals recently dead of the disease. Both *Stomoxys calcitrans* and *Tabanus striatus* were employed in six experiments in the direct method. The primary host in these instances was used 10 minutes after death. A pure culture of anthrax was obtained during the experiments from the skin in the mucous layer of the region where the flies were applied.

The experiments resulting in the transmission of the anthrax organism were tried with an artificially infected guinea pig, which died of the disease upon the third day. The flies were applied two and one-half hours to a few minutes before the death of the blood donor. Guinea pigs were used to receive the infective bites of *Stomoxys calcitrans* and *Tabanus striatus*. Each animal was placed in a gauze sack strapped to an individual board and the flies were induced to feed when applied from separate test tubes. *Stomoxys calcitrans* was used as the porter in two experiments and *Tabanus striatus* in a single experiment. With both species the infection was successfully transferred by the direct method in which the flies were interrupted while feeding on the sick animal. The stable flies were transferred to the healthy animal in one trial with only a few seconds' interval after biting the infected host, and in the other instance an interval of 10 minutes elapsed between the feedings. A total of 20 flies were used in the first experiment and 30 flies in the second trial.

The exposed animals died in both cases during the evening of the third day. Typical pictures of anthrax infection were presented at the necropsy of the two animals. In addition a substantial gelatinous and hemorrhagic edema was observed in the subcutaneous region of the area upon which the flies were applied in biting. The spleens of both animals yielded characteristic square-ended rods, which showed typical picture when tested with McFadyean's differential stain. Pure cultures were obtained from the spleens of the dead animals. The growth on agar resembled that of the initial pure culture, and spores produced on a potato medium stained quite typically. The agar cultures when injected reproduced the disease with fatal results in guinea pigs used in later experiments.

Similar results were obtained in all essentials when horseflies were employed to transfer the disease from the sick to a healthy guinea pig. Three flies were used to carry the infection, with only a few seconds' interval from infected to healthy host. The latter died on the fourth day after the flies were applied. The autopsy was made a few minutes after death. As in the other instances, there was no rigor mortis. The site of fly biting was not much involved; only a slight gelatinous hemorrhagic edema. The subcutaneous injection also was slight. The spleen was greatly enlarged and extremely friable. Stained smears from this organ showed characteristic square-ended rods in great numbers. McFadyean's differential test was very distinct. Numerous nonmotile rods were seen in a hanging drop taken from the heart's blood.

Vigorous growth characteristic of the anthrax bacterium was obtained on agar, and later the disease was reproduced in a horse from a saline suspension of the agar culture.

Typical organisms were seen in the feces of horseflies at various intervals up to 48 hours from the time the infected animal was bitten. The accumulated deposits of 3 tabanids, 2 to 3 days after the infective bites, were injected in a saline suspension into a healthy guinea pig, which died of typical anthrax 4 days later. An agar culture from the spleen of this animal showed typical growth, and a microscopical verification of the character of the organism was obtained.

The feces of the stable fly were likewise found to be infected up to 24 hours after obtaining blood from a sick animal. A nearly pure culture of anthrax was obtained from the droppings of 2 flies fed 24 hours previously on infected material. A mixed culture showing numerous typical rods was obtained from the gut contents of 3 stable flies which were killed 24 hours after biting a sick animal.

A series of experiments is at present being conducted with anthrax in cattle and horses. Guinea pigs or other rodents will in every instance be employed as blood donors, as experience has shown that

it is difficult in large animals to time the probable invasion of the peripheral circulation by the anthrax organisms so as to render insect transmission practicable. An attempt will be made to determine the limits of infection in flies acting as carriers of contaminative material.

EDITOR'S NOTE.—The following message from Manila was received December 31, 1913:

“Anthrax transmission experiments verified *Stomoxys calcitrans* 20 minutes interval harbors bacilli in feces 14 to 17 days inclusive in the stomach 19 days cultures positive *Tabanus striatus* biting direct bacilli in feces 10 days.

“MITZMAIN.”

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.

IN CERTAIN STATES AND CITIES.

SMALLPOX.

Miscellaneous State Reports.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Texas (Nov. 1-30): Counties—			Texas (Nov. 1-30)—Con. Counties—Con.		
Brown.....	1	.....	Nueces.....	1	.....
Dallas.....	18	.....	Tarrant.....	2	.....
Henderson.....	11	1	Van Zandt.....	4	.....
Kaufman.....	18	.....	Total.....	56	1
Matagorda.....	1	.....		

New York—Niagara Falls.

Acting Asst. Surg. Bingham, of the Public Health Service, reported by telegraph that during the week ended January 3, 1914, 33 cases of smallpox had been notified in Niagara Falls, N. Y.

City Reports for Week Ended Dec. 20, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Altoona, Pa.	4	.....	Milwaukee, Wis.....	62	.....
Bayonne, N. J.....	3	.....	Nashville, Tenn.....	16	.....
Buffalo, N. Y.....	2	.....	New Orleans, La.....	1	1
Chicago, Ill.....	2	.....	Niagara Falls, N. Y.....	8	.....
Columbus, Ohio.....	1	.....	Portsmouth, Va.....	2	.....
Evansville, Ind.....	8	.....	Reading, Pa.....	4	.....
Hartford, Conn.....	5	.....	Spokane, Wash.....	16	.....
Kansas City, Kans.....	12	.....	Seattle, Wash.....	2	.....
Knoxville, Tenn.....	3	.....	Superior, Wis.....	1	.....
La Crosse, Wis.....	1	.....	Toledo, Ohio.....	16	.....
Los Angeles, Cal.....	2	.....	Zanesville, Ohio.....	3	.....
Marinette, Wis.....	2	.....		

TYPHOID FEVER.

Texas Report for November, 1913.

Places.	Number of new cases reported during month.	Places.	Number of new cases reported during month.
Texas:		Texas—Continued.	
Atascosa County.....	1	Navarro County—	
Brooks County.....	2	Corsicana.....	10
Brown County.....	6	Parker County.....	1
Dallas County—		Reeves County—	
Dallas.....	22	Pecos.....	1
Delta County—		Rockwall County.....	3
Cooper.....	1	Runnels County—	
Erath County—		Ballinger.....	1
Dublin.....	2	Tarrant County—	
Gonzales County—		Fort Worth.....	9
Gonzales.....	1	Polytechnic.....	1
Grayson County—		Travis County—	
Howe.....	1	Austin.....	4
Hamilton County.....	1	Van Zandt County.....	1
Henderson County.....	1		
Montague County—		Total.....	71
Bowie.....	2		

City Reports for Week Ended Dec. 20, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Ann Arbor, Mich.....	1		Lynn, Mass.....	1	
Baltimore, Md.....	12	2	Moline, Ill.....		1
Binghamton, N. Y.....	1		Nashville, Tenn.....	4	
Boston, Mass.....	6		Newark, N. J.....	2	
Brockton, Mass.....	1		New Orleans, La.....	2	
Buffalo, N. Y.....	9	1	Newton, Mass.....	1	
Chelsea, Mass.....	1		Passaic, N. J.....	1	
Chicago, Ill.....	53	3	Philadelphia, Pa.....	23	4
Cincinnati, Ohio.....	1	1	Pittsburgh, Pa.....	9	2
Cleveland, Ohio.....	4	1	Providence, R. I.....	5	
Columbus, Ohio.....	2	1	Reading, Pa.....	3	2
Concord, N. H.....		1	Richmond, Va.....	4	1
Cumberland, Md.....	1	1	Rockford, Ill.....	2	
Dunkirk, N. Y.....	4		St. Joseph, Mo.....	1	1
East Orange, N. J.....	1		St. Louis, Mo.....	15	1
Evansville, Ind.....	1		San Francisco, Cal.....	8	2
Grand Rapids, Mich.....	6	1	Seattle, Wash.....	4	
Harrisburg, Pa.....	1		South Bend, Ind.....		1
Hartford, Conn.....	1		Springfield, Mass.....	2	
Johnstown, Pa.....		1	Toledo, Ohio.....	2	2
Kansas City, Kans.....	4		Waltham, Mass.....	1	
Knoxville, Tenn.....		1	Washington, D. C.....	3	
Los Angeles, Cal.....	2	1	Worcester, Mass.....	1	
Lowell, Mass.....	4	1	Zanesville, Ohio.....	29	1
Lynchburg, Va.....	1	1			

CEREBROSPINAL MENINGITIS.

Texas Report for November, 1913.

The State Board of Health of Texas reported that during the month of November, 1913, cerebrospinal meningitis had been notified in Texas as follows: Dallas, Dallas County, 3 cases; Athens, Henderson County, 1 case.

City Reports for Week Ended Dec. 20, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Ann Arbor, Mich.....	1		Lowell, Mass.....	1	1
Boston, Mass.....	3	3	Milwaukee, Wis.....	1	1
Chicago, Ill.....	1		Philadelphia, Pa.....	2	1
Cincinnati, Ohio.....	1		Wilmington, N. C.....	1	
Cleveland, Ohio.....	1		Worcester, Mass.....		1

POLIOMYELITIS (INFANTILE PARALYSIS).**Texas Report for November, 1913.**

The State Board of Health of Texas reported that during the month of November, 1913, poliomyelitis had been notified in Texas as follows: Austin, Travis County, 1 case; Erath County, 1 case; Red River County, 1 case.

City Reports for Week Ended Dec. 20, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Boston, Mass.....		1	Philadelphia, Pa.....		1
Buffalo, N. Y.....	1		Pittsburgh, Pa.....	2	
Cleveland, Ohio.....	1	1	Providence, R. I.....	1	
Newark, N. J.....	1				

ERYSIPELAS.**City Reports for Week Ended Dec. 20, 1913.**

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Alameda, Cal.....	1		New Castle, Pa.....	1	
Boston, Mass.....		1	Newport, Ky.....	1	1
Brockton, Mass.....	1		Philadelphia, Pa.....	3	
Buffalo, N. Y.....	5		Pittsburgh, Pa.....	6	
Chicago, Ill.....	6	3	Reading, Pa.....	1	
Cincinnati, Ohio.....	3		St. Louis, Mo.....	2	
Cleveland, Ohio.....	6		San Francisco, Cal.....	10	
Dayton, Ohio.....		1	South Bethlehem, Pa.....	1	
Erie, Pa.....	2		Spokane, Wash.....	1	1
Los Angeles, Cal.....	5		Wilkes-Barre, Pa.....	1	
Milwaukee, Wis.....	1				

PLAGUE.**Rats Collected and Examined.**

Places.	Week ended—	Found dead.	Total collected.	Examined.	Found infected.
California:					
Cities—					
Oakland.....	Dec. 13, 1913	21	581	436	
Berkeley.....	do.....	1	215	137	
San Francisco.....	do.....	4	1,729	1,274	
Washington:					
City—					
Seattle.....	do.....		797	772	2

California—Squirrels Collected and Examined.

During the week ended December 13, 1913, 10 ground squirrels from Alameda County and 1 from Contra Costa County were examined for plague infection. None was found plague infected.

Washington—Seattle—Plague Rats Found.

Surg. Lloyd, of the Public Health Service, reported by telegraph that plague-infected rats had been found in Seattle, Wash., as follows: One on December 9, 1913, 1 on December 13, 1913, 1 on January 4, 1914, and 1 on January 6, 1914.

PNEUMONIA.

City Reports for Week Ended Dec. 20, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Alameda, Cal.....	1		Manchester, N. H.....	2	2
Atlantic City, N. J.....	1		New Castle, Pa.....	2	
Auburn, N. Y.....	3	1	Newport, Ky.....	1	1
Bennington, Vt.....	4	2	Norristown, Pa.....	1	
Binghamton, N. Y.....	6	1	Philadelphia, Pa.....	29	73
Braddock, Pa.....	1		Pittsburgh, Pa.....	19	27
Chicago, Ill.....	91	81	Pittsfield, Mass.....	3	
Cleveland, Ohio.....	20	8	Reading, Pa.....	4	2
Erie, Pa.....	1		San Francisco, Cal.....	10	
Grand Rapids, Mich.....	2	1	Schenectady, N. Y.....	6	3
Harrisburg, Pa.....	2	3	Trenton, N. J.....	3	
Lancaster, Pa.....	1		Zanesville, Ohio.....	1	1
Los Angeles, Cal.....	18	13			

RABIES.

California—Berkeley and Oakland—Rabies in Animals.

Surg. Long, of the Public Health Service, reported by telegraph that during the two weeks ended January 3, 1914, 2 cases of rabies in dogs had been reported in Berkeley, and that 9 cases in dogs and 1 case in a calf had been reported in Oakland, Cal.

TETANUS.

City Reports for Week Ended Dec. 20, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Chicago, Ill.....		1	Richmond, Va.....		2
New Orleans, La.....		1	St. Louis, Mo.....	1	1
Philadelphia, Pa.....	1	1	San Francisco, Cal.....	1	
Pittsburgh, Pa.....	2	1			

TYPHUS FEVER.

Rhode Island—Providence.

January 3, 1914, two cases of typhus fever were reported at Providence, R. I., one having taken sick December 24 and the other December 27, 1913. Three other cases of illness which were not at the time diagnosed as typhus fever but which, in the view of later developments, are believed to have been typhus, occurred in Providence during the latter part of November and the early part of December. The patients in all of these cases had been to some extent associated. The infection is believed to have been introduced by passengers of the steamship *Germania*, which arrived November 30 at Providence from Marseille, France. The first cases now believed to have been typhus fever were in passengers from this vessel.

On January 4 the steamship *Roma* arrived at Providence, having sailed from Marseille December 20 via Lisbon and the Canary Islands. On arrival at Providence a case of typhus fever was found in the person of a steerage passenger who had embarked at Marseille.

SCARLET FEVER, MEASLES, DIPHTHERIA, AND TUBERCULOSIS.

Texas Report for November, 1913.

The State Board of Health of Texas reported that during the month of November, 1913, 134 cases of scarlet fever and 102 cases of diphtheria had been notified in the State of Texas.

City Reports for Week Ended Dec. 20, 1913.

Cities.	Population, United States Census 1910.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Over 500,000 inhabitants:										
Baltimore, Md.....	558,485	180	44	3	4	5	21	.....	33	14
Boston, Mass.....	670,585	276	57	1	39	.....	81	4	56	25
Chicago, Ill.....	2,185,283	631	206	19	35	.....	119	7	144	62
Cleveland, Ohio.....	560,663	174	96	9	16	1	24	4	36	12
Philadelphia, Pa.....	1,549,008	526	66	11	51	1	59	4	87	46
Pittsburgh, Pa.....	533,905	167	42	4	35	1	107	5	21	14
St. Louis, Mo.....	687,029	211	73	3	66	.....	29	3	31	18
From 300,000 to 500,000 inhabitants:										
Buffalo, N. Y.....	423,715	107	40	.....	17	.....	11	.....	29	8
Cincinnati, Ohio.....	364,463	120	27	3	6	.....	7	1	23	19
Los Angeles, Cal.....	319,198	109	7	.....	1	.....	9	.....	33	18
Milwaukee, Wis.....	373,857	85	23	6	20	1	26	2	18	7
Newark, N. J.....	347,469	40	20	.....	131	1	34	.....	21	8
New Orleans, La.....	339,075	142	36	2	11	.....	.....	.....	25	22
San Francisco, Cal.....	416,912	134	14	.....	7	.....	7	.....	19	11
Washington, D. C.....	331,069	97	9	3	1	.....	15	1	10	7
From 200,000 to 300,000 inhabitants:										
Jersey City, N. J.....	267,779	86	.....	3	.....	.....	.....	1	.....	7
Providence, R. I.....	224,326	79	23	2	9	3	16	.....	5	5
Seattle, Wash.....	237,194	41	2	2	2	.....	.....	.....	15	6
From 100,000 to 200,000 inhabitants:										
Bridgeport, Conn.....	102,054	36	10	2	30	3	.....	.....	2	4
Cambridge, Mass.....	104,839	29	3	.....	9	.....	.....	.....	5	4
Columbus, Ohio.....	181,548	68	13	1	.....	.....	.....	.....	2	6
Dayton, Ohio.....	116,577	.....	23	2	25	.....	.....	.....	2	6
Fall River, Mass.....	119,295	37	3	.....	.....	.....	.....	.....	2	3
Grand Rapids, Mich.....	112,571	39	10	2	109	2	20	1	.....	.....
Lowell, Mass.....	106,294	38	6	2	8	.....	.....	.....	2	1
Nashville, Tenn.....	110,364	30	1	.....	.....	.....	.....	.....	4	4
Richmond, Va.....	127,628	52	7	1	.....	.....	15	.....	4	2
Spokane, Wash.....	104,402	.....	3	.....	6	.....	.....	.....	1	1
Toledo, Ohio.....	168,497	56	3	.....	2	.....	7	.....	3	6
Worcester, Mass.....	145,986	33	13	1	5	.....	6	.....	4	.....
From 50,000 to 100,000 inhabitants:										
Altoona, Pa.....	52,127	10	3	.....	.....	.....	1	.....	.....	.....
Bayonne, N. J.....	55,545	13	7	.....	7	.....	.....	.....	3	2
Brockton, Mass.....	56,878	13	6	.....	4	.....	4	.....	2	.....
Camden, N. J.....	94,538	.....	9	.....	3	.....	2	.....	4	.....
Erie, Pa.....	66,525	25	4	.....	2	.....	2	.....	3	.....
Evansville, Ind.....	69,647	16	.....	1	.....	.....	.....	.....	.....	3
Harrisburg, Pa.....	64,186	23	11	.....	.....	.....	2	.....	.....	.....
Hartford, Conn.....	98,915	35	6	.....	3	.....	3	.....	.....	3
Hoboken, N. J.....	70,324	.....	6	.....	.....	.....	2	.....	11	.....
Johnstown, Pa.....	55,482	27	6	2	3	.....	2	.....	.....	.....
Kansas City, Kans.....	82,331	.....	1	.....	.....	.....	4	.....	3	.....
Lawrence, Mass.....	85,892	.....	17	.....	1	.....	.....	.....	3	4
Lynn, Mass.....	89,336	14	6	.....	1	.....	9	.....	3	2
Manchester, N. H.....	70,063	34	5	2	1	.....	8	.....	3	1
New Bedford, Mass.....	96,652	25	6	1	1	.....	10	1	1	1
Passaic, N. J.....	54,773	19	2	.....	3	.....	2	.....	1	1
Pawtucket, R. I.....	51,622	.....	4	.....	3	.....	.....	.....	.....	3
Reading, Pa.....	96,071	29	8	.....	.....	.....	3	.....	.....	4
St. Joseph, Mo.....	77,403	32	.....	1	.....	.....	4	.....	2	4
Schenectady, N. Y.....	72,826	26	1	.....	1	1	5	.....	.....	2
South Bend, Ind.....	53,684	14	2	.....	.....	.....	2	.....	.....	2
Springfield, Ill.....	51,678	14	4	1	1	.....	1	.....	.....	1
Springfield, Mass.....	88,926	24	4	.....	.....	.....	.....	.....	2	3
Trenton, N. J.....	96,815	50	6	.....	.....	.....	6	.....	8	3
Wilkes-Barre, Pa.....	67,105	20	5	.....	.....	.....	3	.....	3	.....
Yonkers, N. Y.....	79,803	23	16	1	31	.....	1	.....	3	3

FOREIGN REPORTS.

AUSTRIA-HUNGARY.

Status of Cholera.

Cholera has been notified in Austria-Hungary, as follows: Bosnia-Herzegovina, November 13 to 20, 1913, 10 cases; Croatia-Slavonia, November 17 to 25, 1913, 31 cases; Hungary, November 16 to 29, 1913, 40 cases with 22 deaths.

CHINA.

Maritime Quarantine Station—Dairen (Dalny).

The following statement was received under date of November 7, 1913, from Consul Pontius:

A completely equipped maritime quarantine station has been established at Dairen. The institution is under the supervision of the Dairen marine office of the Kwantung government (leased territory), and is located just outside Dairen Harbor, at the east end of the city. The construction of the buildings and the cost of equipment represent an outlay of \$215,000. Immediately upon landing the quarantined passengers are placed in a detached ward, where they are bathed before being received in a waiting room.

During the bathing process the clothing is subjected to disinfection on the most approved principles in an adjoining building. On re-dressing, ascent is made to the quarantine station, some 40 or 50 feet above, the several buildings of the institution standing on well-appointed ground and commanding a fine view. There is sufficient accommodation for 508 passengers. There is a fully equipped hospital with a number of sick wards for patients.

Cholera—Plague—Examination of Rats—Hongkong.

Cholera and plague have been notified in Hongkong as follows: Week ended November 8, 1913, 1 case of plague with 1 death; week ended November 15, 1913, 1 case of cholera, and 3 cases of plague with 3 deaths.

During the two weeks ended November 15, 1913, 4,686 rats were examined at Hongkong for plague infection. None was found plague infected.

Plague—Examination of Rats—Shanghai.

During the two weeks ended November 30, 1913, 513 rats were examined at Shanghai for plague infection. Of this number 8 were found plague infected. In the French settlement during the month of October, 1913, 469 rats were examined, 7 rats being found plague infected. Examination is made at Shanghai only in the case of rats found dead.

On November 20, 1913, a case of human plague was notified as having occurred at Shanghai during the week ended October 8, 1913.

CUBA.**Transmissible Diseases—Habana.**

DEC. 10-20, 1913.

Diseases.	New cases.	Deaths.	Remaining under treatment.
Diphtheria.....	8	2	6
Leprosy.....	1		259
Malaria.....	1		16
Measles.....	33		54
Paratyphoid fever.....	8		8
Scarlet fever.....	4		4
Tetanus in the newborn.....	1	1	
Typhoid fever.....	6	1	43
Varicella.....	12		12

¹ From interior points of the Republic.

ECUADOR.**Plague—Yellow Fever.**

Plague and yellow fever have been reported in Ecuador as follows:

MONTH OF NOVEMBER, 1913.

Plague.—In Guayaquil and vicinity (Babahoyo, Milagro, and Yaguachi), 197 cases with 85 deaths.

Yellow fever.—In Guayaquil and vicinity (Milagro and Yaguachi), 7 cases with 5 deaths.

RUSSIA.**Status of Cholera.**

During the period from October 26 to November 8, 1913, 14 cases of cholera with 12 deaths were notified in Russia. The cases were distributed in the Governments of Bessarabia, Ekaterinislav, Kher-son, and Taurida.

TRINIDAD.**Further Relative to Yellow Fever Outbreak—Brighton.**

An outbreak of yellow fever at Brighton, island of Trinidad, was reported in the Public Health Reports of December 5 and 19, 1913, pages 2636 and 2778. The first case occurred in the person of an American who had arrived at Port of Spain from Venezuela, six days

before being taken ill. The case ended fatally. The second case occurred one day after the onset of the disease in the first case and was in the person of an American who had been a resident of Brighton for several months. On December 8, 1913, 3 additional cases were notified in the same locality. The cases all occurred in drillers working in the asphalt lake. Brighton is situated 40 miles distant from Port of Spain and has no direct communication with that place.

TURKEY IN ASIA.

Cholera—Trebizond.

Cholera has been notified in Trebizond as follows: December 9 to 15, 1913; 3 cases with 3 deaths among arrivals on the steamship *Guldjermal* from Constantinople.

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX.

Reports Received During Week Ended Jan. 9, 1914.

CHOLERA.

Places.	Date.	Cases.	Deaths.	Remarks.
Austria-Hungary:				
Bosnia-Herzegovina—				
Zenica	Nov. 19	1		
Vranduk	Nov. 20	1		
Croatia-Slavonia—				
Pozanga—				
Novska	Nov. 18-25	1		
Syrmien—				
Adasevci	do	6	2	
Semlin	do	1	1	
Vitrovia—				
Dobrovic	do	2	2	
Hungary				Total Nov. 9-22: Cases 77, deaths 47.
Bacs-Bodrog—				
Cservenka	Nov. 9-29	18	7	
Dunasecb	do	1	1	
Kula	Nov. 16-22	1		
Szond	Nov. 9-29	25	19	
Jasz-Nagy-Kun-Szolnok—				
Szolnok	Nov. 9-15	2	2	
Pest Pilis—				
Soroksar	Nov. 9-22	2	1	
Szaboles—				
Nyiregyhaza	Nov. 9-15	1	1	
Temes—				
Varasliget	do		1	
Torontal—				
Felseolemer	Nov. 9-29	15	7	
Okeresztur	Nov. 9-15	1	1	
Tiszasentmiklos	Nov. 16-22		1	
Torokbecae	Nov. 9-22	2	3	
Torontaludvor	Nov. 23-29	7	2	
Ung—				
Jasza	Nov. 9-15	1	1	
Ceylon:				
Colombo	Nov. 16-22	2	2	
China:				
Hongkong	Nov. 9-15	1		
Dutch East Indies:				
Batavia and Tanjong Priok	Nov. 16-22	14	11	
India:				
Bombay	Nov. 23-29	1		
Russia:				
Bessarabia—				
Ismail	Oct. 26-Nov. 8	6	1	
Ekaterinislav	do	1		
Kherson	do	6	9	
Taurida—				
Dneiper district	do	1		

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued.**Reports Received During Week Ended Jan. 9, 1914—Continued.****CHOLERA—Continued.**

Places.	Date.	Cases.	Deaths.	Remarks.
Turkey in Asia: Trebizond.....	Dec. 9-15.....	3	3	Among troops from s. s. Guld-jemal. Jan. 8, present.
Turkey in Europe: Constantinople.....	Dec. 8-14.....	47	15	

YELLOW FEVER.¹

Brazil: Bahia.....	Nov. 30-Dec. 6....	1	2	Nov. 1-30: 27 cases and 5 deaths in Guayaquil, Milagro, and Naranjito.
Ecuador.....				
Trinidad: Brighton.....				Total Nov. 27-Dec. 12, 6 cases, with 1 death, including previous reports.

PLAGUE.

Brazil: Bahia.....	Nov. 30-Dec. 6....	3	2	Nov. 1-30, 197 cases, with 85 deaths, in Babahoyo, Guayaquil, Milagro, and Yaguachi.
China: Hongkong.....				
Shanghai.....	Nov. 9-15.....	3	3	
Ecuador.....	Oct. 1-7.....	1		
India: Bombay.....	Nov. 23-29.....	2	2	
Karachi.....				
Turkey in Asia: Beirut.....	do.....	16	19	
	Dec. 10-14.....	2	1	

SMALLPOX.

Algeria: Departments— Algiers.....	Sept. 1-30.....	1	37	Dec. 7-13: Cases, 1.
Oran.....				
Brazil: Bahia.....	Nov. 30-Dec. 6....	5		
Canada: Ontario— Ottawa.....	Dec. 14-20.....	1		
Quebec— Montreal.....				
Dutch East Indies: Java— Batavia.....	Nov. 16-22.....	5	1	
France: Marseille.....	Nov. 1-30.....		31	
Germany.....				
India: Bombay.....	Nov. 23-29.....	2		
Madras.....	do.....	2	1	
Mexico: Acapulco.....	Dec. 6.....		1	
San Luis Potosi.....	Nov. 2-8.....	1		
Veracruz.....	Dec. 14-20.....		1	
Russia: Odessa.....	Nov. 16-29.....	1	1	
Servia: Belgrade.....	Nov. 7-29.....	3	1	
Switzerland: Basel.....	Nov. 30-Dec. 13...	21		
Turkey in Europe: Constantinople.....	Dec. 7-13.....		1	

¹ Report of plague in British East Africa erroneously entered as yellow fever on page 2858, Vol. XXVIII.

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

Reports Received from Dec. 27, 1913, to Jan. 2, 1914.

[For reports received from June 28, 1913, to Dec. 26, 1913, see PUBLIC HEALTH REPORTS for Dec. 26, 1913. In accordance with custom, the tables of epidemic diseases are terminated semiannually and new tables begun.]

CHOLERA.

Places.	Date.	Cases.	Deaths.	Remarks.
Austria-Hungary:				
Bosnia-Herzegovina—				
Brod.....	Nov. 13-18.....	2		
Kostjnica.....	do.....	1		
Novigrad.....	Oct. 26-Nov. 5.....	1		
Šjekocac.....	Nov. 6.....	1		
Zenica.....	Oct. 26-Nov. 18.....	9	2	
Ceylon:				
Colombo.....	Nov. 9-15.....	3	5	
Dutch East Indies:				
Java—				
Batavia and Tanjong Priok.....	do.....	10	8	
India:				
Bombay.....	Nov. 10-22.....	5	4	
Calcutta.....	Nov. 9-15.....		35	
Madras.....	Nov. 16-22.....	2		
Philippine Islands.....				
				Nov. 19, present in Dagupan, Pasig, and Santa Cruz. Nov. 22, present in Cebu.
Manila.....	Nov. 9-22.....	29	18	
Straits Settlements:				
Singapore.....	Nov. 2-8.....	5	4	
Turkey in Asia:				
Trebizond.....	Dec. 19.....			Present.
Turkey in Europe:				
Constantinople.....	Nov. 25-Dec. 7.....	45	17	Total Aug. 2-Dec. 7: Cases 119, deaths 57.

YELLOW FEVER.

Brazil:				
Bahia.....	Nov. 23-29.....	1		
Southern Nigeria:				
Lagos.....	Oct. 20.....	2		Including 1 European.

PLAGUE.

Brazil:				
Bahia.....	Nov. 23-29.....	3		
Rio de Janeiro.....	Nov. 16-22.....	1	1	
British East Africa:				
Kisumu.....	Sept. 12-Oct. 13.....	2	2	
Mombasa.....	Sept. 12-Nov. 15.....	31	10	
Nairobi.....	do.....	3	3	
China:				
Hongkong.....	Nov. 2-8.....	1	1	
India:				
Bombay.....	Nov. 9-22.....	6	6	
Calcutta.....	Nov. 2-9.....		3	
Karachi.....	Nov. 9-22.....	29	29	
Madras.....	Nov. 16-22.....	3	1	
Rangoon.....	Oct. 26-31.....	7	7	
Russia:				
Ural, territory.....				Total Oct. 20-Nov. 10: Cases, 212; deaths, 170; and 2 fatal cases from Isum-Tube.
Djakisabevsk district—				
Djumarta.....	Nov. 9-10.....	5	1	
Djantayu.....	Nov. 8-10.....	2	2	
Kizilu.....	Nov. 8.....	1	1	
Fourteenth village.....	Nov. 7-9.....	6		
Sarbas.....	Nov. 8-10.....	13	7	
Kaziljar district.....	Nov. 5-10.....	39	24	In Assaukurt, Baitchurek, Bis-kuduk, and Djamankuduk.
Lbistchensky district—				
Isum-Tube.....	Oct. 20-Nov. 10.....	138	127	
Kalmikov.....	Nov. 4-10.....	6	6	

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

Reports Received from Dec. 27, 1913, to Jan. 2, 1914—Continued.

SMALLPOX.

Places.	Date.	Cases.	Deaths.	Remarks.
Arabia:				
Aden.....	Nov. 25-Dec. 1.....		1	
Brazil:				
Bahia.....	Nov. 23-29.....	1		
Para.....	Dec. 1-6.....		6	
Pernambuco.....	Nov. 1-15.....		18	
Rio de Janeiro.....	Nov. 9-22.....	35	6	
Canada:				
Ontario—				
Ottawa.....	Dec. 7-13.....	5		
Toronto.....	.....do.....	1		
Quebec—				
Montreal.....	Dec. 7-20.....	8		
China:				
Hankow.....	Nov. 2-22.....	2		
Tientsin.....	Nov. 9-15.....		1	
Dutch East Indies:				
Java—				
Batavia.....	.....do.....	15		
Surabaya.....	Oct. 28-Nov. 8.....	3		
Egypt:				
Alexandria.....	Nov. 26-Dec. 2.....	2	1	
France:				
Nice.....	Nov. 1-30.....	1		
Paris.....	Nov. 23-29.....	4		
St. Etienne.....	Nov. 16-30.....	8	3	
Gibraltar.....	Dec. 1-7.....	1		
India:				
Calcutta.....	Nov. 2-8.....		1	
Madras.....	Nov. 2-15.....	3	1	
Japan.....				Total, Jan. 1-Oct. 31: Cases, 105; deaths, 39.
Mexico:				
Aguascalientes.....	Dec. 1-14.....		4	
Monterey.....	Nov. 17-23.....		3	
Veracruz.....	Dec. 6-13.....	2		
Norway:				
Trondhjem.....	Nov. 1-30.....	5		
Portugal:				
Lisbon.....	Nov. 16-29.....	5		
Russia:				
St. Petersburg.....	Nov. 23-29.....	4	1	
Warsaw.....	Oct. 5-11.....	1	2	
Spain:				
Almeria.....	Nov. 1-30.....		2	
Barcelona.....	Nov. 30-Dec. 6.....		4	
Madrid.....	Nov. 1-30.....		31	
Seville.....	.....do.....		1	
Valencia.....	Dec. 1-6.....	2		
Switzerland:				
Basel.....	Nov. 23-29.....	3		
Turkey in Asia:				
Beirut.....	.....do.....	20	3	
Turkey in Europe:				
Constantinople.....	Nov. 30-Dec. 6.....		2	
Saloniki.....	Dec. 1-7.....		7	

SANITARY LEGISLATION.

STATE LAWS AND REGULATIONS PERTAINING TO PUBLIC HEALTH.

PHILIPPINE ISLANDS.

Tuberculosis—Appropriation for Antituberculosis Society. (Act 2247, Feb. 11, 1913.)

On February 11, 1913, the Philippine Legislature appropriated 50,000 pesos "for the campaign for the extermination of tuberculosis by the Philippine Islands Anti-tuberculosis Society."

Drugs—Dentists Authorized to Prescribe Certain. (Act 2205, Jan. 16, 1913.)

SECTION 1. Duly registered dentists are hereby granted the right granted by act No. 1761 to physicians, to prescribe and administer opium, cocaine, alpha or beta eucaine, or any derivative or preparation of said drugs or substances as a medicine for dental purposes, subject to the regulations prescribed by the collector of internal revenue and approved by the secretary of finance and justice.

Sanitary Districts—Establishment and Support of. (Act 2232, Feb. 8, 1913.)

SECTION 1. Sections 1 and 6 of act No. 2156, entitled "An act authorizing the consolidation of municipalities into sanitary divisions and the reorganization of the municipal boards of health created by act No. 308, defining their powers and duties, and providing for each Province a special fund to be known as 'health funds,' for this and other purposes,"¹ are hereby amended, so that said sections shall read as follows:

"SECTION 1. Provincial boards are hereby authorized, for the purposes of health administration, to divide their Provinces into sanitary divisions, which may comprise one or more municipalities, but not more than four, and these divisions shall become effective in a Province whenever their organization has been agreed to by at least a majority of the municipal councils concerned: *Provided*, That to dissolve such sanitary division the vote of a majority of the municipalities concerned shall be necessary. Any group of municipalities joined to constitute a sanitary division may have a divisional board of health organized in accordance with the provisions of act No. 308 relative to the organization of municipal boards of health.

"There shall be for each division a president, who shall be appointed by the director of health from among the persons proposed by the municipal councils concerned and recommended by the provincial board. The powers, duties, and remuneration of such president shall be fixed in the manner hereinafter provided. The president of a sanitary division shall be a duly qualified physician and shall fulfill his duties under the immediate supervision of the district health officer: *Provided*, That in emergency conditions, of the existence of which the director of health shall judge, persons with qualifications satisfying the director of health may be appointed to act temporarily as presidents of municipal sanitary divisions.

"SEC. 6. Each municipality shall set aside each year an amount not less than 5 per centum nor more than 10 per centum from its general funds and each provincial

¹ This act was published in the Public Health Reports Apr. 18, 1913, pp. 753-756.

board shall set aside a like amount from its general funds, which amount, added to that appropriated by the municipalities under its jurisdiction, shall constitute a special fund to be known as 'health fund': *Provided*, That municipalities whose general funds do not exceed 3,000 pesos a year shall, upon application to the director of health, be exempted from the requirements of this section and shall in such case not be entitled to the benefits of this act.

"The health fund thus created shall be deposited with the provincial treasurer and shall be used only for the purpose of paying the salaries and traveling expenses of presidents, subordinate officers, and employees of the sanitary divisions of the Province, and the traveling expenses necessarily incurred by the same, from their place of residence, upon proceeding to their station to assume the office, upon appointment, and for the purchase of medicines, medical supplies, and disinfectants to be distributed among the municipalities concerned for sanitary and other medical purposes, and other incidental expenses for carrying out the purposes of this act: *Provided*, That, if at the close of the fiscal year there shall remain any balance in the health fund, provincial boards are hereby authorized to accumulate such balances from year to year for the purpose of establishing hospitals, benevolent institutions in the Province, or of carrying out other permanent sanitary improvements: *Provided further*, That whenever in the course of official service any president of a sanitary division travels to visit or attend any pay client or patient, he shall not be entitled to reimbursement for any traveling expenses incurred in this latter regard and shall state in a sworn voucher to accompany his claim for reimbursement that the claim does not include any such expense."

Infant Mortality—Committee to Investigate Causes of. (Act 2246, Feb. 11, 1913.)

SECTION 1. Section 1 of act No. 2116 is hereby amended to read as follows:

"SECTION 1. For the purpose of investigating the causes of the excessive infantile mortality in the Philippine Islands and the methods which should be adopted to decrease it, a committee of five members is hereby created, of whom three shall be appointed by the Governor General, with the advice and consent of the Philippine Commission, and two shall be the professor of pediatrics in the University of the Philippines and the professor of pediatrics in the University of Santo Tomas. The committee shall be immediately organized and elect a chairman from among its members, and each member shall receive as compensation 20 pesos for each day of session actually attended by him and when traveling in the Provinces on official business; but if a Government officer is appointed on said committee he shall not receive the per diems provided for by this act: *Provided, however*, That the members of this committee shall be entitled to the same traveling expenses and per diems as bureau chiefs of the insular government."

SEC. 2. Sections 3 and 4 of act No. 2116 are hereby amended to read as follows:

"SEC. 3. The committee is hereby authorized to employ a secretary, who shall be a typewriter and stenographer, and such subordinate personnel as it may deem necessary, and to purchase such stationery and office supplies, hire such transportation, and incur such incidental expenses as may be necessary for its work. The committee shall present to the third legislature during its second regular session, an exact report in English and Spanish of its work, with such recommendations and drafts of acts as may be necessary. On the same date the committee shall dissolve and be relieved of its functions.

"SEC. 4. The sum of 20,000 pesos, or so much thereof as may be necessary, is hereby appropriated, out of any funds in the insular treasury not otherwise appropriated, to be expended by the committee for the payment of the per diems and any other necessary expenses for carrying out the purposes of this act."

MUNICIPAL ORDINANCES, RULES, AND REGULATIONS PERTAINING TO PUBLIC HEALTH.

AKRON, OHIO.

Bakeries—Sanitary Regulation of. (Reg. Bd. of H., Feb. 13, 1913.)

SECTION 1. Any place used for producing, mixing, compounding or baking, for selling or for the purpose of a restaurant, bakeshop, or hotel, any bread, biscuit, crackers, rolls, cake, pie, macaroni, or any food products of which flour or meal is the principal ingredient, shall be deemed a bakeshop. The regulations of this chapter shall apply also to places, rooms, or buildings where candy is prepared or manufactured.

SEC. 2. Any person, persons, firm, or corporation operating a bakeshop as described in the next preceding section shall take out a permit from the board of health to conduct such business and shall comply with the conditions of said permit, and with the rules and regulations of the board of health, ordinances of the city of Akron, and the laws of the State of Ohio.

SEC. 3. Any place used as a bakeshop shall be provided with floors of closely-joined impervious material which can be thoroughly cleaned.

SEC. 4. Every baker or other person in charge of any bakeshop shall keep the floors, side walls, ceilings, woodwork, fixtures, tools, machinery, and utensils in a thoroughly clean and sanitary condition, and every bakeshop shall be provided with adequate ventilation so as to insure a free circulation of air at all times.

SEC. 5. The door and window openings of every bakeshop shall, from May 1 to November 15, inclusive, be provided with sound screens of mesh sufficiently fine to keep out flies and other insects.

SEC. 6. The side walls and ceilings of every bakeshop shall be well plastered or sheathed with metal, wood, or tile. All plastered walls or ceilings shall be kept lime washed or kalsomined or shall be painted with oil paint, and all woodwork in every bakeshop shall be well oiled and painted and washed clean.

SEC. 7. Every bakeshop shall be provided with adequate plumbing, including suitable washstands and water-closets. No water-closet shall be entered from or shall be in direct communication with the bakeshop. Every washstand in a bakeshop shall be provided with clean towels at all times.

SEC. 8. No person shall sleep in a bakeshop, and the sleeping places of persons employed in bakeshops shall be kept separate from the place where flour or meal or food products are handled or stored.

SEC. 9. No domestic animals shall be permitted in a bakeshop or place where flour or meal is stored in connection with a bakeshop.

SEC. 10. Every owner or person in charge of a bakeshop shall be required to keep himself and his employees in a clean condition and suitably clothed while engaged in the production, handling, or selling of bakery products, and shall provide a dressing room separated from the place where flour and meal is stored or kept.

SEC. 11. Receptacles for expectoration of impervious material, cleaned at least once in every 24 hours, shall be maintained and kept by the person in charge of every bakeshop, and no attendant or other person shall spit on the floor, side walls, or on any place in such a bakeshop.

SEC. 12. Smoking, snuffing, or chewing tobacco is forbidden in a bakeshop. Notice forbidding all persons to use tobacco or to spit on the floors or side walls shall be posted in every bakeshop.

SEC. 13. No person who has tuberculosis, a venereal or other communicable disease, shall work in a bakeshop, and no person in charge of such bakeshop shall require, permit, or suffer such a person to be employed.

SEC. 14. Every bakeshop which shall not be kept in a cleanly condition, free from rats, mice, vermin, and from matter of an infectious or contagious nature is hereby declared to be a public nuisance, and it shall be the duty of the dairy and food inspector to cause the same to be abated.

Water for Domestic Purposes—Sale of. (Ord. May 1, 1913.)

SECTION 1. That no person, firm, or corporation shall sell, offer for sale, or deliver any water for domestic purposes without first having obtained a permit therefor from the board of health.

SEC. 2. Any applicant for a permit or renewal of permit under this ordinance shall state in his application:

(a) His, their, or its name and post-office address.

(b) Location and nature of source of supply of water.

(c) Approximate flow of water from said source, stated in gallons per day.

(d) An analysis of water from said source of supply, made by a competent chemist approved by the board of health, stating the amounts of chlorine, free and albuminoid ammonia, nitrites and oxygen consumed in parts per million, bacteria per cubic centimeters, and presumptive tests for *Bacillus coli*. If desired by the applicant, the analysis required herein may be made by the city chemist, for which a charge of \$5 shall be made and paid by the applicant.

SEC. 3. The source of supply from which water is secured shall be kept at all times in a clean and sanitary condition, shall be protected from the outside elements by an inclosed structure or building, and shall be protected from surface drainage by adequate concrete construction approved by the board of health.

SEC. 4. All vehicles and containers used in the transportation and delivery of water shall be kept in and filled in a place which shall be kept in a clean and sanitary condition at all times.

SEC. 5. All persons engaged in the care and handling of water which is to be sold or delivered must be free from all contagious and infectious diseases, and such persons while engaging in such work must keep themselves and the utensils and appliances used in the work in a clean and sanitary condition. No permit shall be issued by the board of health in pursuance of this ordinance until the board of health has first inspected and approved the premises, source of supply, and methods and means of transportation and delivery, and until all conditions of this ordinance have been complied with and the analysis submitted with the application has been approved by the city chemist.

SEC. 6. Any person, firm, or corporation to whom a permit has been issued under this ordinance, or any officer, agent or employee thereof, shall furnish to the board of health or to the officer thereof, upon request, at any time, samples of water for testing and analysis from the source of supply, wagon, or container of the dealer.

SEC. 7. When water is delivered to families in which there exists any contagious or infectious disease, the person making such delivery shall not enter the house or building in which such contagious or infectious disease exists and shall not permit any containers used in making deliveries to be taken into any such house or building. In making such deliveries the water to be delivered shall be poured into vessels furnished by the occupant of the house, or the containers may be left at the house providing they are kept in such house until quarantine has been raised and such containers are sterilized by order of the sanitary policeman before being removed therefrom.

SEC. 8. All permits issued in pursuance of this ordinance shall be granted for a period of one year, or until January 1 next succeeding the year in which the permit is issued, at which time the permit may be renewed for a period of one year. The board of health may revoke any permit granted in pursuance of this ordinance for failure to comply with the terms and conditions herein set forth.

ALBUQUERQUE, N. MEX.

Board of Health—Organization, Powers, and Duties. (Ord. Aug. 7, 1913.)

SECTION 1. There is hereby established a board of health consisting of five citizens, not more than three of whom shall belong to the same political party. No salary or other compensation shall be paid to any member of said board. Three members shall constitute a quorum. Members of said board shall be appointed by the mayor, in writing, subject to the approval of the common council, and such appointment filed with the secretary of the board. It shall be the duty of the mayor to appoint the first board within 10 days after the passage of this ordinance; one member for 4 years, one member for 3 years, one member for 2 years, and one member for 1 year. The mayor is to be a member and the president of said board. It shall be the duty of the mayor between the last Monday of April and the first Monday of May, each year, to appoint a successor to retiring members. Members of said board shall hold their office until their successor is appointed and qualified. Every person so appointed shall before entering upon his duties, qualify as do members of the city council. Vacancies in the board shall be filled by the mayor for the unexpired term.

SEC. 2. Said board shall hold regular meetings once a month; special meetings may be called by the mayor at his own discretion or upon request of a majority of the members of the board, and shall have power at such meetings to make all rules and regulations as they deem necessary for the maintenance of the public health; for cleansing of streets, alleys, and public grounds, breweries, cellars, factories, tanneries, stables, barns, privies, vaults, cesspools, sewers, slaughterhouses, butcher shops, rendering and boiling establishments, pigpens, and all other nauseous and offensive buildings and structures and the abatement and suppression of all nuisances, whether upon public grounds or private premises, affecting or endangering, in the opinion of said board, the public health; take all necessary measures to prevent the spread of contagious diseases by requiring any and all persons to be vaccinated, by the fumigation, closing, or destruction of infected public or private buildings, and by the destruction of infected bedding or clothing; to provide, control, and have care of such pest-houses or hospitals as may be needed, and to cause persons sick with contagious diseases to be removed to and cared for therein: *Provided*, That no debt or liability against the city shall be incurred by said board of health, unless the same be expressly authorized by the common council by a resolution duly passed for that purpose. All orders of said board shall be executed and enforced by the city physician in person, or in his name, or under his authority, by any patrolman of the city, or by the health officer.

SEC. 3. The city clerk shall be the secretary of the board of health, and shall keep a full record of all the acts, orders, resolutions, rules, regulations, and proceedings of said board.

SEC. 4. Said board of health or any member thereof, the chief of police or any of his subordinates, the city physician or any health officer, shall have the authority to enter into and examine at any time cellars, cesspools, privies, and drains, and all buildings, lots, and places of all descriptions within the city and for a distance of 1 mile from city limits for the purpose of ascertaining the condition thereof so far as public health may be affected thereby, and if deemed a public nuisance or menace to the public health by the city physician or health officer, to cause the dispersion or removal of families or persons from buildings or apartments so much crowded as to be in danger of becoming

infected with any dangerous or pestilential disease, and to cause the abatement or removal of all nuisances in any such building or on such premises.

SEC. 5. Any person refusing to obey the orders of the city physician or health officer or obstructing them in the performance of the duties imposed in the preceding section shall, upon conviction before the police magistrate, be subject to a fine of not less than \$5 nor more than \$50 or imprisonment for not less than 10 days nor more than 60 days, or both such fine and imprisonment, at the discretion of the police magistrate.

SEC. 6. All general rules and regulations that may be made by the board of health for the protection and preservation of health of the inhabitants of said city shall, as soon after the adoption thereof as practicable, be published in the official paper of the city.

Communicable Diseases—Notification of Cases—Quarantine—Disinfection. (Ord. Aug. 7, 1913.)

SEC. 7. The following diseases having been declared by the city board of health to be dangerous to the public health, must be reported immediately to the city physician upon blanks provided for that purpose. The report, personally signed by the physician or person in charge of the case, shall state the name, age, and sex of the patient, the disease, duration of the illness, milk and water supply, and the exact location of the house or room occupied by the patient, and if a school child, what school they attend. Actinomycosis, Asiatic cholera, chickenpox, diphtheria (membranous croup), glanders, leprosy, malignant pustule, measles (German measles), cerebrospinal meningitis, scarlet fever (scarlatina), smallpox, tetanus, tuberculosis, mumps, trachoma, trichinosis, typhoid fever, typhus fever, whooping cough, yellow fever, anterior poliomyelitis. Mumps and tuberculosis are included in this rule but it is not to be reported except where the individual is attending school.

Failure to comply with this rule involves a fine of not less than \$10 nor more than \$50 for each offense, and cost of suit.

SEC. 8. Upon receipt by the city physician of the report of the existence of any of the following diseases a warning placard shall be placed upon or near all entrances of the house or apartment where the case is located. Such card shall show that the room or building is under quarantine and bear the name of the disease. Such placards shall only be removed by a representative of the board of health, and any person removing, destroying, or defacing the same shall be liable to a fine of not less than \$10 or more than \$50: Asiatic cholera, cerebrospinal meningitis, diphtheria (membranous croup), glanders, leprosy, malignant pustule, scarlet fever, smallpox, typhus fever, yellow fever, anterior poliomyelitis. Except in smallpox, provided all inmates of the building will be immediately vaccinated or revaccinated, as the case may be, then there shall be no quarantine, but the place shall be placarded; and persons who have been exposed to diphtheria, if the proper immunizing dose of diphtheria antitoxin shall be administered at once and the proper disinfecting and fumigating is performed under supervision of the board of health. No person, except the attending physician and necessary caretakers, shall enter any apartment where a person is sick with any of the diseases mentioned in this section until the quarantine has been removed by order of the board of health.

SEC. 9. When in the opinion of the board of health circumstances demand it, such premises, in addition to being quarantined, may be placed under the constant supervision of the officers of the law, who shall, under the direction of the board of health, prevent the entrance or exit of any person or the removal of any articles from the house while under quarantine.

SEC. 10. Premises in which are located any of the following diseases will not be placarded or quarantined unless in the opinion of the board of health the conditions are such as to require it for the protection of the public health: Actinomycosis, chickenpox, tetanus, trachoma, trichinosis, typhoid fever, and tuberculosis.

SEC. 11. The premises in which are located any of the following diseases—measles and whooping cough—shall be placarded but not quarantined.

SEC. 12. All cases of contagious diseases shall be quarantined and separated from the rest of the family when so ordered by the board of health, and such quarantine shall be maintained until the patient is declared by the board of health to be free from danger of infecting other persons.

SEC. 13. In the event that any case of diphtheria, scarlet fever, or other disease dangerous to the public health can not be properly isolated the board of health may cause such patient to be removed to a hospital, provided it can be done without danger to his health.

SEC. 14. No person sick with any disease dangerous to the public health, as mentioned in section 8, shall be removed at any time except by permission of the board of health. No person suffering from said diseases shall enter any form of public conveyance in the city of Albuquerque except by permission of the board of health, and then conveyance to be immediately fumigated by health officer.

SEC. 15. Upon removal to a hospital or other place or upon the discharge by recovery or death of the patient suffering from any of the following diseases the premises where said disease existed, together with all bedding, clothing, furniture, or other articles exposed to infection shall be disinfected by the board of health: Cerebrospinal meningitis, cholera, diphtheria, glanders, leprosy, scarlet fever, smallpox, tuberculosis, typhoid fever, typhus fever, yellow fever, anterior poliomyelitis.

SEC. 16. No person shall knowingly let or lease any room, house, or apartment in which there has been a patient suffering from the diseases mentioned in section 15 without having had such house, room, or apartment, and all articles therein liable to infection, previously disinfected to the satisfaction of the board of health. This section also applies to the renting of rooms in hotels, lodging houses, hospitals, sanitariums, or other apartments.

SEC. 17. No furniture, wearing apparel, or other articles exposed to the infection from diseases mentioned as dangerous to the public health (sec. 7) shall be removed, sold, or given away without having been thoroughly disinfected.

SEC. 18. No child or other person suffering or convalescent from any of the diseases mentioned in section 7 shall be permitted to attend any public, private, parochial, Sunday, or other school in the city of Albuquerque without a written permit from a licensed physician written on blanks approved by the board of health but supplied by the board of education. Same rule applies to any child who has been absent from school more than two successive school days.

SEC. 19. Children affected with ringworm, scabies, or impetigo contagiosa will be excluded from school by the medical inspectors or city physician until such time as the disease is cured or shows evidence of such treatment as not to be liable to cause infection of other children. Cases so excluded shall only be readmitted upon the written approval of the medical inspector or city physician.

SEC. 20. A child who has not been vaccinated shall not be admitted to school, except upon presentation of a certificate granted for cause stated therein, signed by the city physician or approved by the board of health that he is not a fit subject for vaccination.

SEC. 21. All children or other persons exposed to the infection of the following diseases shall be excluded from school for the following periods dated from the latest exposure to such infection: Anterior poliomyelitis, 14 days; chicken pox, 14 days; diphtheria, 8 days; measles, 14 days; mumps, 14 days; scarlet fever, 8 days; whooping cough, 14 days.

SEC. 22. All children who contract any of the diseases mentioned in section 21 shall not be granted a permit to return to school for a shorter time than as follows, reckoned from the date of notification given to the board of health:

(a) Chicken pox, 14 days, and thereafter until all scabs have fallen off.

(b) Diphtheria, 15 days, and thereafter until two successive negative cultures have been obtained from the site of the disease, secured at least 24 hours apart. When the attending physician has secured a negative culture for release the procuring of subsequent cultures and final discharge of the patient shall be under the direction of the board of health, but in no instance shall the time be less than 21 days.

(c) Measles, 14 days, and thereafter until all catarrhal symptoms have ceased.

(d) Mumps, 14 days, and thereafter until all glandular swelling had disappeared.

(e) Scarlet fever, 35 days, and thereafter until desquamation is complete and all discharges from mucous membranes have stopped.

(f) Whooping cough, 35 days, and thereafter until all spasmodic cough and whooping have ceased.

(g) Anterior poliomyelitis, 28 days.

When a building is placarded the child or person who has the disease shall not leave their own premises and come in contact with any other child or person. Neither shall they allow any one to enter their premises without first calling their attention to the placard. Failing to observe this section before placard is removed renders responsible person to a fine of not less than \$5 or more than \$10. When quarantine is established by the board of health absolutely no person or anything else shall leave the house without a permit from the board of health until quarantine is removed and premises have been thoroughly fumigated by board of health.

SEC. 23. That the city of Albuquerque shall furnish the city physician with all the necessary materials for the disinfection of rooms and lodgings or residences where disinfection has become necessary. The person for whom the disinfection or fumigation is done shall pay the city physician for cost of same at prices established by the board of health, and the city physician shall pay the money to the city treasurer.

SEC. 24. No person shall bring, or cause to be brought, into said city any person infected with smallpox, scarlet fever, varioloid, or any other infectious pestilential disease. Any person bringing or causing to be brought into the city any person infected with any disease as named in this section shall remove or return immediately from within the city or care for at the expense of such person bringing or causing to be brought into the city any such person so infected.

SEC. 25. No dead body shall be brought into the city of Albuquerque from without its limits where said person died of an infectious or pestilential disease without a permit shall have first been issued therefor by city physician.

SEC. 26. Any physician giving a false certificate to any child or person mentioned in any of the preceding sections shall, upon conviction before the police magistrate, be subject to a fine of not less than \$10 nor more than \$100, or imprisonment for not less than 10 days nor more than 90 days, for each offense.

Hotels, Restaurants, Boarding Houses, etc.—Sanitary Regulation of. (Ord. Aug. 7, 1913.)

SEC. 27. The sanitary inspector, any member of the board of health, or any policeman shall at all times have the right to enter into and upon and inspect any and all hotels, restaurants, cafés, boarding houses, sanatoriums, inns, taverns, and other public eating houses and places in the city of Albuquerque whenever they shall deem it necessary for the preservation of health and the prevention and suppression of disease in said city.

SEC. 27½. That the use of roller towels is prohibited in all hotels, restaurants, saloons, and other public places.

SEC. 28. The owner, proprietor, and any person in charge of any hotel, restaurant, café, boarding house, sanatorium, inn, tavern, or other public eating house or place in the city of Albuquerque shall, in conducting the same, comply with and conform to each and all of the following rules and regulations, to wit:

(a) Kitchen and dining room floors shall be tongued and grooved, or covered with linoleum or other substance in order to prevent deposit and accumulation of filth or dirt in crevices.

(b) No garbage or filth shall be allowed to stand or accumulate about the premises for a longer period than 24 hours.

(c) Milk and butter shall be kept in an ice box separate from that in which meat, vegetables, and other articles of food are kept.

(d) Ice boxes and refrigerators must be thoroughly cleansed and kept in a pure and sanitary condition.

(e) All kitchen and dining room floors shall be carefully mopped and cleaned or oiled at least once every three days.

(f) All knives, forks, spoons, dishes, and other tableware shall be thoroughly sterilized with steam or boiling water each time after they are used.

(g) All kitchens and dining rooms shall be thoroughly screened and protected from dust and flies.

(h) All furniture, counters, cellars, closets, and the surrounding premises must be kept and maintained in a good sanitary condition.

(i) Every room used for the manufacture, storage, or sale of food products shall be light, dry, and airy. Its walls and floors shall be so constructed as to exclude rats and other vermin and shall be at all times free from moisture and kept in good repair. Its floors shall have a smooth surface constructed of wood, cement, or tiles laid in cement.

(j) No water-closet, earth closet, privy, or ash pit shall communicate directly with any bake room or kitchen of any hotel, restaurant, café, boarding house, sanatorium, inn, tavern, or other public eating house or place.

SEC. 29. Any person violating any of the provisions of this ordinance shall, on conviction thereof before the police magistrate of the city of Albuquerque, be punished by a fine not to exceed \$50 nor less than \$10 for each offense, or upon default in the payment of such fine, by imprisonment not to exceed 60 days.

Foodstuffs—Care and Sale of. (Ord. Aug. 7, 1913.)

SEC. 30. No person shall sell or offer for sale, or have in his possession with intent to sell, in this city any unwholesome, decayed, or stale fruit, vegetables, or provisions of any kind whatever, or any tainted, diseased, corrupt, decayed, or unwholesome meat or fish, or any adulterated or misbranded article of food or drug. For the purpose of this ordinance a food or drug shall be considered adulterated if—

(a) Anything has been mixed with it to reduce or lower its quality or strength.

(b) Anything inferior or cheaper has been substituted wholly or in part therefor.

(c) Any valuable constituent has been abstracted wholly or in part from it.

(d) It consists wholly or in part of a diseased, decomposed, or putrid animal or vegetable substance.

(e) By coating, coloring, or otherwise it may be made to appear of greater value than it really is.

(f) It contains any added poisonous ingredient.

Nothing in the above shall be construed to prevent the altering of foods or drugs or the addition of harmless colors thereto if such alterations or additions be permitted by the national food and drug act and be made in conformity to the same.

SEC. 31. Meat, poultry, game, fish, sea food, dried or preserved fruits, dates, figs, cherries, grapes, berries, cut fruits, cut melons, cracked nuts or nut meats, candies, maple sugar, confectionery or baker's products shall not be kept, sold, or offered for sale in or near an open window or doorway, outside of a building or in any street, private way, or public place of the city of Albuquerque, unless so covered or screened as to be protected from contact with animals, flies, and dust. No article intended to

be used as food shall be exposed or displayed in any street or way, or in front of any place of business, unless the bottom of the box or other receptacle containing such articles is raised at least 24 inches above the sidewalk, platform, or landing upon which such receptacle rests.

SEC. 32. Meats or other products, named in section 31, shall not be carried through any street, private way, or public place unless properly protected or screened from dust and flies. Every person being the occupant or lessee of any room, stall, building, or place where any meat, poultry, game, fish, sea food, milk, vegetables, butter, fruit, confectionery, baker's products, or other articles intended for human food shall be kept, stored, sold, or offered for sale, shall maintain such room, stall, building, or place and its appurtenances in a clean and wholesome condition. Every peddler of food-stuffs from wagons or carts, in addition to the covering or screen provided for in this regulation, shall keep in his wagon or cart a suitable receptacle for the wastes of his business, such wastes to be disposed of in a manner that shall not create a nuisance.

SEC. 33. No person or corporation, individually or by his agents, servants, or employees, shall transport meat or poultry of any description through the public streets or ways of the city of Albuquerque except in wagons or vehicles which have been thoroughly washed at least once in every 24 hours. All bakery products shall be wrapped in clean wrapping paper at the bakery before it is to be transported through the streets, by some one dressed in a clean white uniform, with clean hands.

Ice Cream—Manufacture, Care, and Sale. (Ord. Aug. 7, 1913.)

SEC. 34. No person shall sell or offer for sale in the city of Albuquerque ice cream or preparation similar thereto, until the place of manufacture of the same, the utensils and receptacles used, and the wagon or other means of carrying the same shall have been examined by the inspector of the board of health. Such inspector, when satisfied as to the cleanliness of all articles used, shall provide such person with his certificate to that effect. The board of health shall examine all articles used in the business as often as they may deem necessary, and whenever an inspector shall certify that proper cleanliness is not observed, either in the place of manufacture, in the implements, materials, or manner of making ice cream, etc., or in the manner of carrying or selling the same, no further sales of such ice cream shall be allowed until the objectionable features are removed and the inspector so certifies.

SEC. 35. Any person violating any of the provisions of sections 30, 31, 32, 33, or 34 of this ordinance shall, upon conviction before the police magistrate, be subject to a fine of not less than \$5 nor more than \$100, or imprisonment for not less than 5 days nor more than 90 days, or both such fine and imprisonment at the discretion of the police magistrate.

Manure—Care of. (Ord. Aug. 7, 1913.)

SEC. 36. No person, persons, partnership, or corporation shall deposit, place, permit, or allow to be deposited or placed any manure or barn cleanings of any kind or description for a longer period than 48 hours upon any premises within the city of Albuquerque, except as herein provided. All manure or barn cleanings of any kind or description shall be kept and placed in boxes or bins which shall be closed and absolutely fly proof and approved by the city health officer or board of health, and no such bin or box shall be built, kept, or maintained nearer to any adjoining house than 25 feet, and then the contents thereof shall be removed and the said box or bin thoroughly cleaned at least once every 30 days during the months of April, May, June, July, August, September, and October, and oftener if the city health officer shall so direct and order.

The above provisions shall not apply to manure used for agricultural or gardening purposes provided the same shall be spread upon the premises not to exceed 6 inches

in depth. Manure for gardening or agricultural purposes may be stored unscreened, but not nearer than 150 feet from any dwelling house. It shall be the duty of the health officer or the chief of police of said city to notify any person, persons, partnership, or corporation who shall deposit or place, or allow to remain or be deposited or placed, any manure or barn cleanings, or who shall build, keep, or maintain or allow or permit to be built, kept, or maintained, any bin or other place for holding manure contrary to the provisions of this ordinance to remove said manure or barn cleanings or the contents of said box or bin within 48 hours, and if not removed within said time after the service of such notice upon such person, persons, partnership, or corporation, it shall be the duty of the health officer to cause the removal of such manure or barn cleanings at the expense of the party keeping or allowing the same to remain contrary to the provisions of this ordinance, and the costs and expense of such removal may be recovered by the city in an action of assumpsit against said person, persons, partnership, or corporation in any court of competent jurisdiction, in addition to the other penalty herein provided.

SEC. 37. Any person, persons, partnership, or corporation who shall violate the provisions of section 36 of this ordinance shall be punished by a fine of not less than \$5 and not exceeding \$50 and cost of prosecution for every separate day upon which such manure or barn cleanings shall be allowed to remain upon the premises after the expiration of the time provided in this section.

Milk and Milk Products—Production, Care, and Sale. (Ord. Aug. 7, 1913.)

SEC. 38. It shall be unlawful for any person to sell, dispose of, or to offer or keep for sale as human food, any milk within the city of Albuquerque without first obtaining a permit therefor in accordance with the provisions of this ordinance.

SEC. 39. Any person desiring a permit pursuant to this ordinance shall first make a written application therefor to the board of health, stating the following facts:

- (a) The name and place of residence or business of the applicant.
- (b) Whether said applicant is a producer of milk.
- (c) The exact location of the dairy and herd which produces the milk.
- (d) The number of cows in each dairy herd.
- (e) If this applicant is not a producer of milk, the name of each person from whom he obtains or is about to obtain milk, the location of each dairy, and the number of cows in each herd from which the milk is obtained.
- (f) That the applicant will permit the board of health or any one authorized by said board of the city of Albuquerque, prior to the issuance of a permit, to inspect in accordance with this ordinance his dairy and herd, and that he will permit such inspection at any time thereafter. If the applicant is not a producer of milk, or if he sells or is about to sell milk not produced by his own cows, his application must be accompanied by a written statement from the owner of each dairy or herd where such milk is produced to the effect that such owner will consent to an inspection by the board of health or any one so authorized, prior to the issuance of any permit for the sale of milk in the city of Albuquerque from such herd or dairy, and that he will permit such inspection to be made at any time thereafter.
- (g) If the dairy or herd of the applicant, or the dairy or herd from which he obtains or is about to obtain milk for sale in the city of Albuquerque, shall have been inspected by an inspector employed by or under the authority of the State of New Mexico, or of the State wherein such milk is produced, or of the United States, or by an inspector working under the direction of or in cooperation with the board of health of the city of Albuquerque, the applicant should state that fact in his application, and present his papers if he has any from the State or United States inspector.

SEC. 40. Upon the filing of such application, the board of health shall cause the dairy and herd of the applicant or the person from whom he obtains his milk, to be

thoroughly inspected to ascertain if the same conforms in all respects to the provisions of this ordinance. Said inspection may include the "tuberculin test" as a diagnostic agency for the detection of tuberculosis in such animals. If upon such inspection it be found that such herd is free from tuberculosis and free from all other contagious or infectious diseases, and that the cows are fed, housed, and cared for, and that such dairy is maintained and operated and the milk therefrom is handled, transported, sold, and delivered in the city of Albuquerque in a clean and sanitary way, and all in accordance with the provisions of this ordinance, the board of health shall issue to such applicant a certificate of inspection, and no such certificate and no permit shall issue to any applicant until such inspection shall have been made: *Provided*, That if it shall appear from the application and satisfactory proof thereof shall be furnished to the board of health that such dairy and dairy herd have been inspected within one year prior to the date of such application by any of the inspectors mentioned in subdivision (g) of section 39 of this ordinance, and it shall appear to the board of health that such test was coextensive with the tests and inspections required by this ordinance and that such dairy and dairy herd was found upon such inspection to be in a condition conforming to the provisions of this ordinance, then, in such event, the board of health may adopt such inspection in lieu of the initial inspection required by this section, and may issue a certificate to such applicant as above set forth.

SEC. 41. If upon making the inspection herein provided for, the dairy or herd are not found upon such inspection to conform in all respects to this ordinance, no certificate or permit shall issue to such applicant until such dairy has been made to so conform nor until all cows and animals affected with disease have been removed from the dairy and herd and the dairy disinfected under the supervision of the board of health. No certificate or permit shall issue to any applicant who refuses to permit his dairy or herd to be inspected as herein provided, nor shall any applicant receive a permit who sells or is about to sell milk in the city of Albuquerque from any dairy or herd, wherever situated, the owner of which refuses to permit such dairy or herd to be inspected as herein provided.

SEC. 42. Upon the receipt of the certificate of inspection provided for by sections 40 and 41 of this ordinance, the applicant shall pay to the treasurer or clerk of the city of Albuquerque the annual fee provided for by section 44 of this ordinance. The applicant shall then present to the city clerk of the city of Albuquerque his certificate of inspection, together with his receipt from the treasurer or clerk, and the city clerk shall then issue a permit to sell milk in the city of Albuquerque for the unexpired period of the then current year. Each permit shall be numbered, and said number is to be placed in a conspicuous place on wagon or vehicle or in store, as the case may be.

SEC. 43. Each permit issued under the provision of this ordinance shall be issued upon the condition that each person so granted a permit, as well as the person from whom he obtains his milk, shall at all times permit the board of health of the city of Albuquerque, or the dairy and milk inspector thereof or other proper agents authorized by or cooperating with said board, to thoroughly inspect in accordance with this ordinance any dairy or herd from which milk is obtained for sale or consumption within the city of Albuquerque. If any person granted a permit under this ordinance shall at any time refuse to permit an inspection of his dairy or herd as herein provided for, his permit shall be revoked by the board of health. If any person granted a permit shall sell milk in the city of Albuquerque from any dairy or herd, the owner of which shall have refused to permit an inspection of his dairy as herein provided for, the permit shall be revoked by the board of health. Any permit issued under this ordinance may also be revoked for any failure or refusal of the person holding the permit, or person from whom he obtains his milk, to comply with this ordinance, or the laws of the United States, or of the State wherein the milk is produced, or any rule or regulation of the board of health.

SEC. 44. The fees for a permit for the sale or disposal of milk or cream in the city of Albuquerque shall be as follows:

All persons keeping two or more cows and selling or offering milk for sale shall be designated as milk dealers and shall pay a fee of \$6 per annum, payable in advance.

Each creamery or milk depot shall pay a fee of \$5 per annum, payable in advance.

Stores, houses, bakeries, delicatessen, and other places at which milk is sold in limited quantities but not there produced shall pay a fee of \$1 per annum, payable in advance.

Such permit shall expire on the 1st day of December next ensuing the issuance thereof, and no permit shall be issued for less than one year, except to a person commencing business, in which case the permit shall be issued to the 1st day of December next ensuing: *Provided*, That the full amount of the annual permit fee must be paid for any permit issued under the provisions of this ordinance: *Provided further*, That persons obtaining a permit under section 44 of this ordinance when said ordinance shall have become operative may obtain a permit expiring in December 1, 1913, for one-half of the sums named in this section.

SEC. 45. In addition to the fees mentioned in section 44 of this ordinance, each owner or keeper of two or more cows, the milk or cream of which sold in the city of Albuquerque, shall pay an inspection fee of \$1 per annum, payable in advance semi-annually: *Provided*, That any person or persons who have paid the milk dealer's license of \$6 shall be exempt from payment of this inspection fee upon six cows.

SEC. 46. No person who has in good faith filed a proper application as herein provided shall be prosecuted upon the charge of selling milk in the city of Albuquerque without a permit, pending action on such application by the board of health, but in all other respects such applicant shall during such time and at all times comply with this ordinance and all of the rules and regulations thereof, and it shall be unlawful for such applicant or any person to sell or have for sale in the city of Albuquerque milk produced by tubercular or otherwise diseased cows, or any unwholesome milk, or to violate this ordinance in any way.

SEC. 47. The board of health is hereby authorized to employ one or more competent persons who shall be known as dairy and milk inspectors, and whose duty it shall be, under the supervision and direction of the board of health, to see that the provisions of this ordinance are enforced. The salary of each such dairy and milk inspector shall be the sum of \$25 per month, payable monthly out of the general fund. In addition to the foregoing employees, the board of health may appoint other competent dairy and milk inspectors, when required, to serve without pay.

SEC. 48. It shall be the duty of the board of health, and the inspectors employed by and under the direction of, or cooperating with the board of health, to inspect in accordance with this ordinance all dairies and herds in the city of Albuquerque, and all dairies and herds outside of the city of Albuquerque from which milk is produced for sale or delivery within the city of Albuquerque, and to see that such dairies and herds and the handling and sale of milk therefrom conform to this ordinance. An initial inspection shall be made upon each application for a permit, as provided by sections 42 and 43 of this ordinance, and thereafter twice each year without any previous notice to the owner of such dairy or herd. Additional inspections shall be made whenever there is reason to believe that this ordinance is being violated. The tubercular test may be applied once each year to each animal producing milk to be disposed of for human food in the city of Albuquerque. The place and things to be inspected by said officers shall include all dairies and dairy herds and all milk produced therefrom, and all barns, stables, cow yards, creameries, stores, railroad cars, delivery wagons, and all places and implements and utensils through, by, or from which milk is furnished to the city of Albuquerque and its inhabitants, and for the purpose of making such inspection said board of health or its authorized inspectors are hereby authorized to open any can or vessel containing milk or cream and take a sample there-

from not to exceed 1 quart for the purpose of testing or analyzing the same, and in case such sample shall be proved upon such examination to be held with intent to sell in violation of any of the provisions of this ordinance said board of health shall cause to be revoked the permit held by such person.

SEC. 49. It shall be unlawful for any person engaged in the sale or disposal of milk or cream in the city of Albuquerque to change the source of supply of said milk or cream, or any part thereof, without first sending a written notice to the board of health, stating the names of the persons supplying such milk or cream and the location of the dairies from which the same is procured, and the number of cows in the dairy herds. If such new source of supply shall not have been already examined and inspected as required by this ordinance, it shall be unlawful to sell milk therefrom in the city of Albuquerque until such inspection shall have been made and until the same is made to comply with this ordinance. If any new cow is added to any herd from which milk is supplied in the city of Albuquerque, it may be so inspected before its milk is sold or placed upon the market in the city of Albuquerque.

SEC. 50. It shall be unlawful for any person to sell in the city of Albuquerque, or to ship or bring into said city for sale as human food, any unclean, impure, infected, unwholesome, watered, adulterated, or chemically preserved milk, or any milk produced under insanitary conditions about the barnyard, or drawn in overcrowded, unventilated stables, or stables which are filthy from accumulation of animal refuse, or which are insanitary from any other cause; or any milk prepared for market in dark, unclean, unventilated milk rooms, or collected or conveyed in unclean, insanitary utensils or vehicles; or milk exposed to pollution, or infected by flies, or infected in any other way; or any milk drawn from sick or diseased cows with filthy udders, or from cows within 30 days before or 6 days after parturition; or any milk handled in any way by sick, unclean, or diseased persons, or persons having recently been exposed to any infectious or contagious disease; or any milk drawn from cows fed upon garbage or slops from distilleries, breweries, vinegar factories, or any similar slops, mash, or food that has been subjected to fermentation or putrefaction. Nothing herein contained shall prevent the feeding of fresh malt or silo food.

SEC. 51. All cows from which milk is sold in the city of Albuquerque shall be comfortably sheltered or housed in buildings; such buildings shall be well ventilated, not less than 500 cubic feet of air space for each cow. All stables where cows are continually housed shall be supplied with an abundance of dry, clean bedding of straw or similar material. The cows shall be well fed with clean, wholesome food and have an abundance of clean, fresh water accessible. All stables shall be clean, well drained, and free from all filth and contaminating surroundings, and manure shall not be allowed to accumulate in such stables. The barnyard and places where the cows are allowed to be shall be well drained and free from filth, standing liquid manure. All manure shall be removed daily to a field or proper pit at least 50 feet away from such stables and yards. Cows shall at all times be kept clean, and just before milking shall be brushed on and around the udder and under and on the side of the cow to remove loose hair or other particles that may have accumulated. The udders shall be clean and dry at the time of milking, and the hands of the milker shall be clean and dry. The air in the stable at the time of milking shall be free from dust, foul air, and obnoxious or unwholesome odors. All stables in which cows are milked must be provided with well-drained cement floors.

SEC. 52. Milk which is to be sold or delivered in the city of Albuquerque shall immediately upon being drawn from the cow be removed from the stable to a light, well-ventilated room, which shall be separate and apart from said stable, and said milk shall be cooled to a temperature below 60° F.; and any milk reaching a temperature above 60° F. shall, for the purposes of this ordinance, be declared unwholesome and unsalable as fresh milk.

SEC. 53. All utensils used for the collection or transportation of milk or cream shall, before being used, be thoroughly washed and then sterilized with boiling water or live steam for not less than 10 minutes. Any milk or cream collected or transported in utensils not treated and cared for as above provided shall, for the purposes of this ordinance, be declared unwholesome and unsalable as fresh milk or cream. All vessels or utensils used for shipping milk or cream to the city of Albuquerque from points outside of the city shall be securely sealed.

SEC. 54. No milk or cream offered for sale in the city of Albuquerque shall be drawn or placed in bottles except on the premises on which said milk is produced, or on the premises of the retailer or wholesaler, in which case it must be handled in a cleanly and sanitary manner satisfactory to the board of health, and protected from pollution of every kind; and any milk bottled while being transported shall, for the purposes of this ordinance, be declared unwholesome and unsalable as fresh milk.

SEC. 55. No milk or cream shall be delivered in bottles which are to be returned to the dealer at any house under quarantine or at any house where such dealer has been given notice that typhoid fever or other contagious disease exists.

SEC. 56. That there be, and hereby is, established the following standard of normal milk, and normal milk is hereby defined to be milk containing not less than 3.25 per cent of butter fat, and not less than 8.5 per cent of milk solids other than butter fat, and having a specific gravity of not less than 1.029 or more than 1.034, and free from dirt, pus, blood cells, and disease germs. Milk or cream containing more than 500,000 bacteria to the cubic centimeter shall, for the purposes of this ordinance, be declared unwholesome and unsalable as fresh milk or cream. All cream shall contain not less than 18 per cent of the fatty portions of pure milk which rise to the surface when milk is left at rest or is separated by other means.

SEC. 57. No person shall sell, deliver, or expose or hold for sale, in the city of Albuquerque, or ship or bring into the city of Albuquerque for sale as human food any milk from which the cream or any part thereof has been removed unless the same shall be labeled in red letters, "Skimmed milk," and unless the same be represented to be and is sold as skimmed milk. All hotels and restaurants, hospitals and sanitariums in the city of Albuquerque serving skimmed milk shall have displayed a sign or placard in a conspicuous place with the words "Skimmed milk" in letters not less than 3 inches in height thereon; the said sign or placard shall be so placed where same can be seen from all parts of the dining room or rooms, and shall have the same listed "Skimmed milk" on the bill of fare.

SEC. 58. The board of health shall keep a record of all certificates of inspection granted for the sale of milk in said city and shall keep such records in a systematic manner and available for the inspection of the public.

SEC. 59. At the end of each month a report of all inspections made during that month shall be submitted by each inspector, in writing, to the board of health. If the scoring system recommended by the United States Bureau of Animal Industry shall not be made, the board of health shall notify the dealer that his permit will be revoked if upon further investigation the dairy shall be found insanitary. A statement of the score of each dealer may be published on the 10th day of each month in the city official newspaper.

SEC. 60. The board of health of the city of Albuquerque is hereby authorized and empowered to, from time to time, formulate such rules and regulations, not inconsistent with the provisions of this ordinance, and necessary to secure a standard of milk required by the provisions of this ordinance; and it shall be unlawful for any person to fail, neglect, or refuse to comply with such rules and regulations, and the council may revoke any permits issued upon recommendation of said board.

SEC. 61. When any milk sold or kept for sale in the city of Albuquerque is found upon inspection or otherwise to be in a condition or of a quality prohibited by this

ordinance, or produced or handled in violation of this ordinance, the board of health, after giving the owner an opportunity to be heard in defense of his property, may cause the same to be destroyed or disposed of otherwise than as human food.

SEC. 62. Any person who violates any of the provisions of sections 38 to 61, both inclusive, of this ordinance shall, upon conviction thereof in the police court, be punished by a fine of not more than \$100 or by imprisonment in the city jail not exceeding six months, or by both such fine and imprisonment, in the discretion of the court. In prosecutions under this ordinance it shall not be necessary to prove guilty knowledge or criminal intent.

City Chemist—Appointment and Duties. (Ord. Aug. 7, 1913.)

SEC. 63. There is hereby created the office of city chemist, who shall be appointed by the mayor and approved by the city council. His salary shall be \$25 per month, payable out of the general fund. It shall be the duty of the city chemist to make or cause to be made a chemical bacteriological and other test of any milk, butter, cream, or ice cream sold or offered for sale within the city of Albuquerque for the purpose of determining the quality and purity thereof according to the standard provided by the board of health. Said samples as required for analysis shall be collected and delivered to the city chemist by some one ordered to do so by the board of health.

SEC. 64. Said city chemist shall be the milk and dairy inspector, as defined in this ordinance.

He shall not be required to make the tubercular test as required to be made of all cows, but if allowed to do so by the board of health, same shall be paid for by the owner of said cows. The city chemist shall make monthly written reports to the board of health. All inspections and tests herein and all officers charged therewith shall be under the supervision of the city physician.

SEC. 65. Any additional duties required of the city chemist by the board of health shall be paid for by city in addition to his regular monthly salary.

Dead Animals—Disposal of Bodies of. (Ord. Aug. 7, 1913.)

SEC. 66. The owner of any animal that shall die within the city shall within 24 hours cause the carcass to be removed at least 2 miles beyond the city limits, unless said owner shall bury said animal at some place outside the limits of the city at a depth of not less than 6 feet. In no case shall any carcass be buried within the city limits, nor shall such owner permit such carcass to remain in the open air in the city until it becomes offensive in smell. Any person offending against this section shall be punished as hereinafter provided.

Nuisances—Disposal of Factory Refuse and Offensive Matter. (Ord. Aug. 7, 1913.)

SEC. 67. *Refuse from factory, etc.*—If any person shall allow to flow from any house, shop, factory, stable, slaughterhouse, or other place, any foul or nauseous liquor, or substance of any kind whatsoever, into or upon adjacent ground or lot, or into any street, alley, or ditch within the city, so as to be offensive, nauseous, hurtful, or dangerous, and any persons who shall deposit in any such place any filth, litter, or refuse of any carcass or thing, so as to be offensive, nauseous, hurtful, or dangerous to any portion of the inhabitants of said city, he shall be punished as hereinafter provided.

SEC. 68. *Depositing filth in acequias, etc.*—If any person shall throw, or deposit any carrion, dead animals, offal, filth, or other unwholesome, putrid, or offensive substance upon the margin or banks, or into the waters of any river, stream, pond, ditch or acequia within the limits of said city, he shall be punished as hereinafter provided.

SEC. 69. *Placing offensive matter in streets.*—If any person shall throw, place, or conduct into any street, avenue, alley, or lot, any beef, pork, fish, hides, or skins of any kind, or any filth, offal, dung, filthy or bloody water, dead animals, vegetables, or other unsound or offensive substance whatsoever, or anything likely to become offensive, or shall permit to remain upon any premises or in any outhouse, privy, stable, or other place owned by him, or under his charge, so as to become offensive to any person residing in the vicinity, or such premises, house or place, any such filth, offal, or other offensive substance as aforesaid, he shall be punished as hereinafter provided.

Spitting—Prohibited in Public Places. (Ord. Aug. 7, 1913.)

SEC. 70. It shall be unlawful for any person to spit or expectorate upon any of the public sidewalks or crosswalks in the city of Albuquerque, or upon any public pass, bypass, or highway in any public park in said city, or upon the floor or steps of any public building in said city, or upon the floor or steps of any store, church, opera house, hall, office, room, or any other building in which the people of said city are in the habit of frequenting, assembling, or congregating, or upon the floor or steps of any street car or other public conveyance. Any person offending against this section shall be punished as hereinafter provided.

SEC. 70a. Any person violating any of the provisions of sections 66, 67, 68, 69, or 70 of this ordinance shall be fined not to exceed \$50 or imprisoned not to exceed 90 days, or both such fine and imprisonment.

Sanitary Inspector—Appointment and Duties. (Ord. Aug. 7, 1913.)

SEC. 71. There is hereby created the office of sanitary inspector, who shall be appointed by the mayor and confirmed by the city council, and he shall have police powers and shall hold his office at the pleasure of the city council. For his services as sanitary inspector he shall receive the sum of \$75 per month when on duty as such inspector.

SEC. 72. It shall be the duty of the sanitary inspector to obey only the orders of the city physician and president of the board of health and to see that all health ordinances and sanitary regulations of the city are rigidly enforced. He shall devote his whole time and attention to the discharge of his office and as often as possible shall inspect every portion of the city. He shall have full power to compel the abatement and removal of all nuisances after notice is given as the city ordinances specify. If anyone fails to comply with the notice given by this sanitary inspector, it shall be the duty of the inspector to cause his immediate arrest and prosecution before police court. He shall see that all complaints entered in his office are properly attended to, see that the city scavenger conforms to existing ordinances and regulations in the removal of matters offensive, and shall at all times be in readiness to make inspection as the board of health may direct. He shall make monthly reports to the board of health of his official actions, with such suggestions for their consideration as his experience may dictate.

SEC. 73. It shall be the duty of the sanitary inspector, whenever he shall deem it necessary to secure the public health, to enter in the daytime into the house or upon the premises of any person within this city, to ascertain the existence of any nuisance therein or thereupon, to examine into the conditions and numbers of persons in such house or upon such premises, to inspect the vaults, cellars, privies, cesspools, and drains of such houses or premises, and make his report thereon to the proper authorities.

SEC. 74. It shall be the duty of the said inspector to appear in police court on the part of the prosecution in conjunction with the city attorney and to furnish such evidence as he may be able to secure of all violations of health and sanitary regulations and insist on the strict enforcement of the same.

Burial Permits—Permits Required for Burial or Shipment of Bodies. (Ord. Aug. 7, 1913.)

SEC. 75. The body of a person who dies in or is buried from this city shall not be buried or shipped without a permit from the board of health signed by the city physician, which shall cost \$1 for local burial permits and 50 cents for a certified copy of the same. The shipping permits for a dead body shall cost \$2.50. Any person violating the provisions of this section shall be fined not less than \$5 nor more than \$50.

Births—Registration of. (Ord. Aug. 7, 1913.)

SEC. 76. Physicians, midwives, or any person attending a birth in city shall report same on blanks furnished by the board of health within five days after the event to the city physician, and shall receive as compensation for making such report 5 cents for each report furnished. Anyone failing to comply with this ordinance shall be fined not less than \$5 nor more than \$10.

Definitions of Terms Used in Ordinance. (Ord. Aug. 7, 1913.)

SEC. 77. The word "person" whenever used in this ordinance shall be taken to mean and include natural persons of either sex, copartnership, corporations, and associations of persons, whether acting by themselves or by any servant or agent or employee; the singular number shall include the plural and the masculine pronoun shall include the feminine. Whenever the word "sell" or any of the forms of that word are used in this ordinance, it shall mean and include the delivery, giving away, or otherwise disposing of the article mentioned, and also the keeping or exposing for sale or the placing upon the market of such article for human food. The word "milk," unless otherwise expressly stated, shall mean and include milk, cream, and any liquid derivative of milk.

Bottles—Cleaning of. (Ord. Aug. 7, 1913.)

SEC. 78. That all bottling works be required to cleanse and wash all bottles according to rules and regulations prescribed by the board of health.

ALLIANCE, OHIO.

Milk and Milk Products—Production, Care, and Sale. (Reg. Bd. of H., July 14, 1913.)

SECTION 1. No person shall bring into the city of Alliance for sale or shall sell or offer for sale any milk or cream without a permit from the board of health. Said permit not to be transferable.

SEC. 2. No person shall bring into the city of Alliance for sale or shall sell or offer for sale any whole milk which has been obtained from any milk dealer, dairyman, or other person not having a permit issued by the board of health.

SEC. 3. A fee of 50 cents shall be charged for each permit, and the same shall be credited to the sanitary fund.

SEC. 4. Permits shall be renewed semiannually on or before June 30 and December 31. The applicant must state his name, residence, post-office address, and location of his business place or places.

SEC. 5. The applicant must state the number of cows from which milk is obtained for sale and the number of gallons (estimated) sold daily.

SEC. 6. Any dairyman, milk dealer, or other person, upon application to the health officer for a permit or renewal to sell or deliver milk, shall file a written statement giving his name and address; the number of cows he owns or has charge of; the average amount of milk (estimated) which he sells each day; the names, addresses, and

license numbers of all persons from whom he buys milk; and the amount (estimated) which he buys from each of them each day.

SEC. 7. The board will not issue any permit unless it is satisfied, after inspection, with the quality of milk, the cleanly and sanitary conditions of milking, the stables, cows, wagons, store, or place of business of the applicant therefor, and with all the utensils used by him from which his milk or cream is obtained, and that the food given the cows is pure and wholesome, and that all persons engaged in the care and handling of the milk are free from any contagious or infectious disease, and that said persons use due cleanliness in their work, and that all the whole milk and cream be handled in accordance with the provisions hereof. Should the applicant live at such a distance from the city of Alliance as to make it impracticable for the dairy and food inspector to visit such dairy premises, such applicant shall furnish evidence, satisfactory to the board, of the sanitary conditions of his dairy.

SEC. 8. *Handling the milk.*—Immediately after milking the milk shall be removed from the stable into a milk room, screened from flies and other insects, aerated or cooled to at least 60° temperature, and put into perfectly clean bottles or cans. Dairy men who use bottles and cans in delivering milk shall not fill bottles while on their delivery route, and no person shall transfer milk intended for sale from one receptacle into another receptacle on any street or alley in the city of Alliance, Ohio.

SEC. 9. *Milk delivery wagons.*—No one shall use any vehicle for the retail delivery of milk in the city of Alliance which has not been marked thereon in legible Roman letters not less than 3 inches in height, and on both sides of the vehicle in a conspicuous place, the name of owner, the number of his permit, and if such vender sells skimmed milk each and every container of skimmed milk shall have the words "Skimmed milk" inscribed thereon in plain letters, not less than 1 inch in height, plainly visible to the prospective purchaser.

SEC. 10. No person or dealer shall give, furnish, sell, or offer for sale, or deliver any whole milk or cream in quantities less than 1 gallon except in sanitary bottles, sealed with a suitable cap with name of said bottler, dairyman, or dealer printed on said cap. Said bottles are not to be used for any purpose other than milk purposes. No person or dealer shall sell, offer for sale, or deliver any whole milk or cream in quantities exceeding 1 gallon unless the can or receptacle containing the same is securely covered: *Provided, however,* That the persons or dealer engaged exclusively in the wholesale delivery or sale of whole milk and cream from wagons not carrying milk for retail customers may deliver the same from covered cans or receptacles: *And provided further,* That said wagon or wagons shall have inscribed conspicuously thereon in plain letters, not less than 3 inches in height, the words "Wholesale delivery." Cans with faucets will not be allowed.

No person or milk dealer shall sell, deliver, sell or offer to sell, or keep for sale in stores milk or cream in quantities less than 1 gallon unless delivered and kept in the original package or container. (Exception—Original package of greater capacity than 1 quart may be broken for sale if the unsold portion is kept in the original package, properly closed, and portion sold and delivered to purchaser in closed vessel.) The compartment where milk or cream is kept shall be separated by an impervious water and odor proof partition from all other compartments of any ice box or refrigerator. Neither milk nor cream shall be kept in the same compartment with any other foodstuffs except butter and cheese.

SEC. 11. Any milk dealer or producer of milk who shall fail or neglect to comply with each and every provision of these orders and regulations shall be subjected to penalties as provided by law.