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PARATYPHOID FEVER.

A REPORT OF AN OUTBREAK IN A HOSPITAL AT ROANOKE, VA.

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The following outbreak is reported because of the rarity of reported outbreaks of paratyphoid fever in America and because this particular outbreak presents certain features of interest to epidemiologists.

The institution involved is a private surgical hospital of about 40 beds located in Roanoke, Va. The buildings, situated in the residential portion of the city, are modern and well built. They are supplied with water from the city supply and provided with modern sewerage connected with the public system.

THE OUTBREAK.

The outbreak comprised 16 cases verified bacteriologically, and two other cases, probably paratyphoid, but not verified. At the time of the outbreak the city of Roanoke was practically free from cases of typhoid fever and no cases of paratyphoid had been reported.

The first probable case was in the person of a colored boy who had been for several days employed as a helper in the hospital kitchen. On January 9 he developed a high fever and was removed to a room outside the hospital. Typhoid was at once suspected and a blood culture was made. The blood culture proved negative and the following day the boy left town, returning to his home in the country. According to the best reports available he was sick only two or three days. Ten days later, on January 19, the resident surgeon of the hospital developed a fever and was confined to bed about seven days. His case was diagnosed as influenza, the fever lasting only one day after the patient took to bed. Blood culture was not made. Widal test was negative to typhoid, but there was suggestive clumping, with paratyphoid B. bacilli.

No further cases developed until February 14, at which time the outbreak proper began, comprising 16 cases and lasting until March 26.

CLINICAL COURSE.

The course of the fever was interesting and could be accurately followed, as all the patients were operative cases and their temperatures and pulse rates were recorded on the clinical charts. There were few or no prodromal symptoms, the fever developed suddenly, reaching its maximum of 104° or 104.5° in two or three days, then shading off to normal in from five days to three weeks. The symptoms were all exceedingly mild, the patients being fairly comfortable throughout. One case had dysenteric symptoms at the beginning of the fever, but in the other 15 cases no abdominal symptoms were noted and hemorrhages were absent. Rose spots were noted in most of the cases.

All the patients recovered promptly without complications. The diagnosis was established by agglutinative reactions and by isolating the specific organism from the blood and excreta of the patients.

INCUBATION PERIOD.

The incubation period was apparently from 5 to 10 days, averaging 8 days. One case developed fever five days after admission. In one case, in which the patient spent only a few hours in the hospital, symptoms developed eight days after exposure.

CHRONOLOGY OF THE OUTBREAK.

The chronology of the cases is shown graphically on the accompanying chart. The cases were scattered through the 40 days of the outbreak, 10 cases occurring in the period from February 22 to March 2.

PERSONS ATTACKED.

With the exception of the two probable cases previously mentioned, all the cases were among patients of the hospital and none of the staff, nurses, attendants, or help, numbering 35 in all, exhibited any symptoms of the complaint.

Census of the hospital Feb. 25, 1913.

Staff:	
Physicians	5
Nurses	16
Servants	11
Total staff	32
Patients	38
Total hospital population	70

ATTACK RATE.

The attack rate was high. In the period between February 4 and March 26, 84 persons were admitted to the hospital, of whom 16, or 19 per cent, developed the disease.

CASES OF PARA-TYPHOID FEVER ACCORDING TO DATES OF DEFINITE ONSET.

Sex and age of persons attacked.

Sex.	Ages in years.						Total.
	0–4	5–9	10–14	15–19	20–24	25 and over.	
Males	.....	3	1	2	1	.....	7
Females	.....	1	.....	4	1	3	9
Total	.....	4	1	6	2	3	16

LOCATION OF CASES.

The hospital is divided into four wards, two on each floor. The number of patients in each ward averages about 10. Of the 16 cases 12 were in patients in wards 3 and 4, located on the south side of the house, 4 only being in the two wards on the north side of the house. Nine were on the first floor, 7 on the second. The preponderance of cases was, therefore, on the south side of the house, independent of the arrangement as to floors.

FOOD AND DRINK.

The water supply of the hospital is taken from the city supply, which is of excellent quality. The milk is from a city dairy which collects milk from a number of farms and supplies the mixed milk to a considerable proportion of the inhabitants of Roanoke. No cases other than those in the hospital were reported from Roanoke at this time.

All other food supplies are purchased at stores in the city and are common to a large part of the population of the city.

Owing to the fact that the patients were all operative cases, the clinical charts showed exactly what they had received in the way of nourishment and medication from the time of admission to the development of symptoms.

The following table shows the relation of the onset of the fever to the time of admission, of operation, and of the first liquid and solid nourishment:

Case No.	Number days elapsing between—				Case No.	Number days elapsing between—			
	Admission and fever.	Operation and fever.	First liquid food and fever.	First solid food and fever.		Admission and fever.	Operation and fever.	First liquid food and fever.	First solid food and fever.
1	5	5	5	4	9	8	8	6	4
2	8	8	4	1	10	10	9	7	7
3	7	7	5	5	11	10	9	7	7
4	6	6	5	2	12	14	10	7	7
5	9	9	5	4	13	9	9	8	7
6	16	14	12	11	14	10	9	7	5
7	15	6	4	2	15	9	8	8	8
8	11	8	5	4	16	9	9	6	6

CONTACTS.

While in any hospital contact between patients, nurses, and attendants is intimate, in this instance no one person reasonably likely to have been a spreader of the infection could be found who, during the causation period of the outbreak, had been in direct contact with all the persons affected. The division of labor among nurses and attendants is by floors, while the cases were about equally distributed between the floors. There is no division corresponding to the striking preponderance of cases on the south side of the hospital. The internes were assigned by wards. All patients were in contact with the operating staff, but the conditions of surgical asepsis obtaining in the operating room precluded the idea of the infection having been contracted there.

The first case to develop in the course of the outbreak proper was in a surgical patient who, while in the hospital from February 4 to February 28, was accompanied and attended by a relative. This patient was ill with the fever for 6 or 7 days before the nature of the infection was suspected. The relative was an inveterate visitor and in spite of remonstrances did visit and attend in various ways 10 of the 16 surgical patients who subsequently developed the fever. It so happened that most of the old and the newly formed acquaintances of this visitor were among the surgical patients in the two wards on the south side of the hospital, and this fact furnished the only clew found to account for the remarkable preponderance of cases among patients on that side of the hospital.

INSECTS.

The outbreak occurred at a time when flies were almost entirely absent. At the time of the investigation a few flies had appeared, but not in sufficient numbers to justify the conclusion that they had played any considerable part in the spread of the infection.

There was found also one variety of roach, commonly called "Croton bug," which infested every part of the hospital. Other insects were not found.

BACTERIOLOGICAL FINDINGS.

Bacteriological studies were made with a view to determining (1) the nature of the infection from which the patients were suffering, and (2) the source and modes of spread of the infection. Within the period of the investigation 7 of the cases developing in the course of the outbreak were in the hospital and accessible for study. From these 7 patients specimens of blood, feces, urine, wound drainage,

and nasopharyngeal secretions were examined with the results indicated in the following tables:

Patients examined for typhoid and paratyphoid bacilli.

	Date of examination.	Onset of fever.	Blood culture for—			Widal reaction with—		
			Typhoid.	Paratyphoid.		Typhoid.	Paratyphoid.	
				A.	B.		A.	B.
A	Mar. 23	Feb. 26	.....	.....	.....	–	–	+
L	...do....	Mar. 2	.....	.....	.....	–	–	+
H	...do....	Mar. 8	–	–	–[1]	–	–	+
R	...do....	Mar. 13	–	–	+	–	–	+
K	...do....	Mar. 19	–	–	+	–	–	+
S	...do....	Mar. 20	–	–	+	–	–	–
W	Mar. 26	Mar. 26	–	–	+	.....	.....	.....

	Feces culture for—			Urine culture for—			Wound drainage culture for—			Throat culture for—		
	Typhoid.	Paratyphoid.		Typhoid.	Paratyphoid.		Typhoid.	Paratyphoid.		Typhoid.	Paratyphoid.	
		A.	B.		A.	B.		A.	B.		A.	B.
A	–	–	–	–	–	–	.....	.....	.....	–	–	–
L	–	–	–	–	–	–	.....	.....	.....	–	–	–
H	.....	.....	.....	–	–	–	.....	.....	.....	–	–	–
R	–	–	+	–	–	–	–	–	–	–	–	–
K	.....	.....	.....	–	–	–	–	–	–	–	–	–
S	–	–	–	–	–	–	.....	.....	.....	–	–	–
W	–	–	–	–	–	–	.....	.....	.....	.....	.....	.....

[1] Fever declining when blood culture was made.

The technique of making the blood cultures was to take, under aseptic conditions, from a vein at the elbow 5c. c. of blood and plant this in 20 c. c. of sterilized beef bile. After incubating the blood-bile mixture at 37° C. for about 24 hours three drops were plated on Endo's medium. Any typhoid or paratyphoid-like colonies appearing on the plates were planted in bouillon and Russell's medium. After growth had been obtained in these media the cultures were tested with specific agglutinative sera and run through different culture media for positive identification.

The organisms isolated from the blood of patients R, K, S, and W and from the feces of patient R were culturally and morphologically typical paratyphoid B bacilli. They agglutinated promptly in high dilutions of a known specific paratyphoid B agglutinative serum and in dilutions of 1–100 of serum obtained from the patients, but would not agglutinate in relatively low dilutions of either specific typhoid or specific paratyphoid A agglutinative serum.

Blood serum from five of the six patients tested gave a positive Widal reaction with stock paratyphoid B bacilli, but gave negative

results with both typhoid and paratyphoid A bacilli. In making Widal tests dilutions used were 1–50 and time given for reaction was one hour.

The findings from the Widal tests and cultural tests of the blood and feces of the patients left no doubt that the outbreak was caused by the paratyphoid B bacillus.

Since the epidemiological evidence pointed to personal contact as the mode of spread of the infection, the possibility of the infection existing in the secretions of the nasopharynx of the affected persons was considered, but all of the throat cultures were negative. The throat culture was made as follows: A pledget of cotton was rubbed on the tonsils and back wall of the pharynx and then dropped into a tube of bouillon. After the tube had been incubated about six hours, plants were made from its contents onto Endo plates. Paratyphoid-like colonies appearing on the Endo plates were fished and tested on the different determinative culture media and with specific agglutinative sera. The paratyphoid agglutinative sera used were obtained from rabbits at the Hygienic Laboratory in Washington, D. C., which had been injected periodically with increasing doses of cultures of organisms of the paratyphoid A and paratyphoid B groups, respectively.

In the endeavor to determine the sources of the infection examinations were made (1) of collections of dirt and drainage from the refrigerator in the main kitchen; (2) of flies, roaches, and rats caught in the hospital; (3) of samples of the water supply; and (4) of specimens of blood, feces, urine, and nasopharyngeal secretions from all persons—including especially physicians, nurses, and servants—in the hospital to whom the epidemiological evidence pointed as possible carriers of the infection. The results of all these examinations were negative for paratyphoid bacilli.

Including the 14 or 15 persons to whom the epidemiological evidence pointed as possible carriers of the infection, there were in the hospital 29 persons all told whose blood was tested with paratyphoid bacilli for the Widal reaction, and 37 all told whose feces and urine were examined for paratyphoid bacilli, but all with negative results.

The several collections of insects emulsified and examined consisted of flies and roaches caught during the period of the investigation in the wards, kitchens, and dining rooms of the hospital.

Three samples of the water supply—one from a tap on the north side of the hospital, one from a tap on the south side of the hospital, and one from a tap at the laboratory several blocks down town from the hospital—were examined for *Bacillus paratyphosus* and *Bacillus coli*. All three samples were negative for *Bacillus paratyphosus*. Two of the samples in quantities of 1 c. c. and 10 c. c. were negative for *Bacillus coli*, while one, the sample collected from the tap on the

north side of the hospital, showed *Bacillus coli* in the 10 c. c. portion, but not in the 1 c. c. portion.

Summarized, the bacteriological studies established beyond reasonable doubt that the outbreak was caused by infection with *Bacillus paratyphosus*, group B, and suggested by the negative findings in the search for carriers (1) that the outbreak was on the wane, and (2) that the infection was confined to the patients, and therefore readily controllable.

POSSIBLE SOURCES OF INFECTION.

A careful study of the evidence collected and summarized above led to the prompt exclusion of certain factors as possible causative agents. The importation of the infection from outside the hospital in water, milk, or other foods could be positively excluded. The disease was too evidently limited to the hospital to allow of any such assumption.

The possibility of a carrier in the general kitchen infecting the food at the time of its preparation was, of course, thoroughly considered. The absence of infection among the house staff and attendants, the fact that a number of cases had had no food from the general kitchen before developing fever, and the peculiar distribution of cases in the hospital strongly negatived this possibility. Infection of food in the diet kitchens was also highly improbable, since there are only two diet kitchens, one for the two wards on each floor, and the distribution of the cases was uniform between the two floors, but over three times greater for the two wards on the south side than for the two wards on the north side of the hospital.

Besides a very few flies and a good many roaches, no insects were found in the hospital. The flies and roaches appeared to be distributed quite uniformly throughout the hospital. Such insects as these would be expected to operate in the spread of paratyphoid infection through the contamination of foods. The distribution of cases, the evidence against the infection having been distributed from the kitchens, and the negative results of the bacteriological examination of several considerable collections of the insects strongly suggested that insects could not have played more than a very small part, if any, in the dissemination of the infection.

The possibility of a human carrier infecting by finger contact the persons affected was thoroughly considered. No one person except the resident surgeon and the head nurse had been in contact with all the patients. It was not considered in the least likely that either of these two persons had had any considerable part in the spread of the infection, and furthermore the bacteriological examinations of blood, feces, urine, and nasopharyngeal secretion from the entire staff,

nurses, servants, and attendants gave negative results for paratyphoid infection. Thus both the epidemiological evidence and the bacteriological findings were strongly against the possibility of a human carrier among the personnel of the hospital being the source of the infection.

After the reasonably definite exclusion of all the factors usually first to be suspected in institution outbreaks, there remained for consideration personal contact, or conveyance of the infection to the surgical patients by fingers of persons who were attending actual but unrecognized cases of paratyphoid fever. The disease, probably introduced by the colored boy and continued by the house surgeon, existed for several days in the first case to develop in the outbreak proper before the nature of the infection was suspected. It is quite possible that at the time the house surgeon became infected some of the other members of the hospital personnel or some of the surgical patients in the hospital also became infected without subsequently manifesting the disease in a clinically recognizable form. The hospital is a surgical one and its personnel is unaccustomed to treating communicable diseases. The infection, becoming seeded in the wards while the first cases were being regarded as "grippe," may have been transmitted on the fingers of nurses and attendants, through clinical thermometers, drinking glasses, specially prepared diets, etc., from patient to patient. The meddlesome visitor, before referred to, may have had a part in the spread of the infection.

REMEDIAL MEASURES.

The measures recommended to control the infection were as follows:

1. Rigid isolation of all the cases.
2. Prompt and thorough disinfection of excreta from all patients in the hospital, with disinfection of bedpans and urinals each time used.
3. Strict medical asepsis on the part of all nurses in going from patient to patient.
4. Sulphur fumigation of pantries and kitchen to destroy water bugs and other insects.
5. Trapping and "swatting" of flies.
6. General and thorough cleaning of the entire hospital.

All of these measures became effective March 26, 1913. Rigid isolation of all suspected cases had been effected for about a week before. The last case in the outbreak developed on March 26. No further cases have been reported to date, May 17.

CONCLUSIONS.

1. The disease prevailing in the hospital was a fever caused by infection with *Bacillus paratyphosus* B.

2. The incubation period was 5 to 10 days, averaging 8 days.

3. The organism was recoverable by blood culture from cases on the first day of the disease.

4. The infection was spread by finger conveyance from case to case in the wards.

5. Strict medical asepsis was sufficient to control the spread of the disease.

OUTBREAK AND SUPPRESSION OF PLAGUE IN PORTO RICO.

AN ACCOUNT OF THE COURSE OF THE EPIDEMIC AND THE MEASURES EMPLOYED FOR ITS SUPPRESSION BY THE UNITED STATES PUBLIC HEALTH SERVICE.

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Summary.

There were 55 cases of human plague in the Porto Rico epidemic, 10 having occurred at the date of announcement of the disease and 45 thereafter. All were of the bubonic type, with a mortality of 65 per cent.

Flea infestation in Porto Rico is very low compared with other tropical countries. The data is not sufficient to determine if there is a seasonal variation. The species of fleas encountered on rodents were: *Xenopsylla cheopis, Echidnaphaga gallinacae, Ctenocephalus canis,* and *Pulex irritans,* with the addition of *Rhynchoprion penetrans* on human host. The infectation of rats by chicken flea in San Juan is noteworthy. The decline in rat population, as indicated by the weekly catch, was marked and to a large degree was the result of rat proofing. The rat infection extended to four points outside of San Juan: To Carolina, a distance of 14 miles; Caguas, 23 miles; Arecibo, about 50 miles, and Rio Piedras, 3 miles. Only in the first-named village did human cases occur.

The presumptive evidence points to an extension by infected rats in merchandise. The infection in Rio Piedras might have been carried there by migratory rodents.

In Porto Rico the *Mus norvegicus, Mus alexandrinus* and *Mus rattus* infest houses, but the former predominates. *Mus alexandrinus* is the species found in rural districts. Sufficient data is not at hand as to the variation of breeding, but it is probable that there is no seasonal fluctuation of this nature among the rodents of Porto Rico.

General Considerations.

INCEPTION OF RAT EPIZOOTIC.

Plague was determined present in San Juan on June 19, 1912, at which time 13 human cases or more had actually occurred. That there had been for several weeks previous a rodent infection seems highly probable, not only from the well-known precedence of human infection by rat epizootic, but by the results of inquiries in San Juan as to the evidence of a previous rat epizootic. From reliable sources of information it developed that a marked and unexplainable mortality among rats along the water-front district was noticed as early as the latter part of April or the first part of May. An inspector in the customs warehouse reported that at the above-mentioned period he had noticed several dead rats each morning upon opening up the warehouse. He was especially impressed because the mortality could not be accounted for, no poison having been distributed. A similar recital was elicited from other warehouse men. This observation of rodent epizootic, it is to be noted, was made in warehouses receiving foreign shipments.

DURATION OF INFECTION IN SAN JUAN.

From the time service eradicative measures were inaugurated until the last plague rat was captured in San Juan, there elapsed a period of 67 days, or 84 days from the official declaration of plague. The decline and cessation of infection can be ascribed only to the marked reduction of rats with their plague-carrying parasites. This result, while immediately due to trapping and poisoning, was very largely dependent upon the thorough rat-proofing measures instituted. Rat proofing not only deprives the rodent of an abode—a place to live and breed—but it removes from him his food supply. In urgent need of new quarters and food, the dispossessed rodent, provided he has escaped death from the hands of workmen, falls a prey to poison or traps. It is thought that the most potent factor in the decline of fleas was the destruction of these parasites in the measures incident to rat proofing. When a food depot was rat proofed, rat runs were securely sealed in by the concrete, and the fleas therein were thus destroyed. The widespread use of petroleum likewise caused a diminution in their numbers.

GENERAL DESTRUCTION OF PROPERTY AS ANTIPLAGUE MEASURE NOT RATIONAL.

In the first days of the epidemic there was a widespread belief that Puerta de Tierra should be burned. The result of this procedure would not have been more effective in preventing plague than was rat proofing. The rats would have been scattered to all parts of the city, and possibly a migration started that would have created a

widespread dissemination of infection throughout the island. There would have been left homeless several thousand people, and aside from the question of property rights and legal involvements there would have been destroyed several million dollars of property that otherwise has been saved. The contention that many unsightly houses would have been destroyed by a general conflagration and replaced thereafter by better appearing construction should not enter into general sanitary considerations. Some stress is laid on this subject as an argument against general destructive measures which have no place in practical sanitation.

GENERAL INSANITARY CONDITIONS NOT PRODUCTIVE OF PLAGUE.

In Porto Rico, as was noted in India, general insanitary conditions did not seem to be a factor influencing in any way the incidence of human cases. The most squalid part of Puerta de Tierra, a section located on the seashore, where from the nature of the swampy ground the houses had been built more or less elevated, was especially free from human cases. From a superficial viewpoint one would have expected this section of congested shanties and indescribable squalor to have suffered heavily from the ravages of the disease. The swampy nature of the ground, which is more or less inundated by the daily tides (which necessitated an elevated construction), operated for the salvation of these people. The better part of Puerta de Tierra was the section that had the majority of cases. The whole of Puerta de Tierra, however, despite its present unsightly and general insanitary condition, is to-day the district of San Juan most free of rats, and, consequently the best part of the municipality, from a plague standpoint. Of the 1,127 buildings, all are either elevated 2 feet with underpinning free or have a concrete floor and side walls. The marked diminution in rat population could have been secured in no other way than by rat proofing, as it is impossible to prevent the people residing there from throwing more or less foodstuffs about the streets and lots.

UNUSUAL INCREASE IN MICE POPULATION.

Accompanying the tables of rats caught is given the catch of mice (*Mus musculus*). No bounty was paid for mice, and the traps used were a large pattern intended solely for the catching of rats. While any efforts of the trappers along this line were discouraged, they were directed to turn in all captured mice. The increasing number of mice, therefore, which would have been considerably multiplied had no special effort been made to catch them, all the more emphasizes the decrease in the rat population. It is well known that mice do not live or multiply in numbers when associated with rats (*Mus rattus* or *Norvegicus*).

Description of the Municipality of San Juan.

The city of San Juan, the capital of Porto Rico, with a population of 50,000, is located on a headland. The site of the city is really in the form of a peninsula separating San Juan Bay from the ocean. Two narrow estuaries cut through this tongue of land with the formation of two islands. The two estuaries, however, are well bridged. On the point of the peninsula is located the old city, together with the water front district called La Marina and a small suburb called La Perla.

Continuing inland, Puerta de Tierra is next met with. This is a district of San Juan, built almost wholly of frame construction, and separated from the old city by a quarter of a mile of unbuilt-upon land. Continuing farther toward the base of the peninsula, Santurce is encountered. It is of modern construction and for the most part the buildings are frame. It is separated on the one side from Puerta de Tierra by a well-bridged estuary with a considerable stretch of unoccupied land, and on the other side from the mainland by an estuary which is likewise well provided with bridges. While this territory comprises the municipality of San Juan, the different types of buildings in the various districts, the varying social conditions that obtain in each, and the fact that some of these localities are well separated one from another, make it necessary to allude to each district separately.

Inception of the epidemic.

The first suspicious case examined was that of a patient, on June 15, in the district of San Juan, known as Puerta de Tierra. The necropsy revealed a "double pneumonia in stage of red hepatization with left axillary bubo." Smears from the tissues and exudate of of the cadaver were made and studied jointly by Dr. Gonzáles Martínez, bacteriologist of the insular department of sanitation, and Dr. F. J. Hernández, assistant bacteriologist, with Surg. S. B. Grubbs, of the United States Public Health Service, in conference. A bacillus was observed showing bipolar tinctorial peculiarity when stained. Some stress was laid on the fact that it was gram negative, nonmotile when observed in hanging drops of fluid exudate, and that it appeared bipolar when stained.

Between June 15 and June 19 other similar cases occurred and the bacteriological studies continued. A guinea pig was injected intraperitoneally with the exudate from the peritoneal cavity of a suspected case. The animal died of a mixed infection, but smears made from tissues and exudates showed large numbers of bipolar bacilli. The organism was not isolated in pure culture nor Koch's postulates for its identification carried out; but the fact that it was

constantly observed in the suspicious cases examined, together with the marked clinical sysptoms and increasing number of cases, justified the diagnosis of plague.

On June 19 plague was officially declared present in San Juan, and the acting governor requested by cable the services of an officer of the United States Public Health Service experienced in plague work. The insular authorities, especially the acting governor, Mr. M. Drew Carrel, and the acting director of sanitation, Dr. W. R. Watson, as soon as the diagnosis of plague was determined, acted with a decision and honesty of purpose seldom seen in the inception of plague epidemics, and with rare frankness a proclamation was promptly issued making public the presence of the infection not only to the people of San Juan but to all the world.

In accordance with the request of the acting governor that a service officer experienced in plague be sent to Porto Rico, I received orders on June 20 to sail from New York, and arrived in San Juan June 27. Asst. Surg. C. L. Williams sailed on the same boat. From that date to the time when the service assumed charge of plague suppressive measures, I was associated in an advisory capacity with the director of sanitation.

On June 30 it was agreed, at a conference with the acting governor, Mr. M. Drew Carrel; the director of sanitation, Dr. W. F. Lippitt; and Surg. S. B. Grubbs, that all work pertaining to the eradication of plague would be turned over to the United States Public Health Service. At this conference it was proposed that the work of the Public Health Service should embrace the purely eradicative activities, and that the insular department of sanitation should attend to the hospitalization of cases; the maintenance of isolation and detention camps; the furnishing of office and laboratory buildings necessary for the service operations, and all unexpendable supplies; the collection and disposal of garbage, and the inspection of suspicious dead. The necropsy of suspicious cases was to be done jointly by the local department and the service, the bacteriological procedure being carried out in the service laboratory.

In addition to suppressive measures, the maintenance of detention camps and the hospitalization of cases were later turned over to the service.

Organization of Work.

The service plan of operation decided upon embraced the following: (1) The quickest possible rat proofing of the whole city; (2) the thorough supervision of inland-bound freight, that no rodents should escape from San Juan in packages of merchandise; (3) a special force of men for widespread trapping and poisoning; (4) a laboratory force to examine all captured rodents; (5) the tagging of all rats collected so

that the location of any infected rodent would be known and the progress of infection mapped out; and (6) the sulphur fumigation (in conjunction with intensive rat proofing) of all infected premises. Disinfection was not utilized, being considered not pertinent to antiplague measures in absence of the pneumonic type, aside from involving a waste of time and money. In its stead, however, flea-destruction measures were observed. Sulphur fumigation and petroleum spray were the agents employed for this purpose.

This plan followed along the lines of the service organization employed in San Francisco during 1908, which was attended by such satisfactory results. Such modifications were made as local conditions required. It was recognized that merely to confine measures to individual foci of infection would not arrest the march of infection and would be inoperative to any early termination of cases, either rodent or human; and that while both human and rodent foci merited immediate treatment, more especially the latter, eradicative measures should be equally vigorous in the sections of the city that were as yet free from infection.

The week following June 30, the date of the conference at which the service was requested to take charge of plague work, was devoted to securing a force of competent employees and providing an effective rat-proofing ordinance. Due to the interested cooperation of the director of sanitation, the organization was greatly facilitated by the acquisition of a number of men who had proven their worth in the local department and were given indefinite leave to work with the service.

Some time previously a tentative rat-proofing law had been drafted by the insular board of health. To this was added at suggestion of your representative a section for rat proofing of buildings already constructed; dwellings to be elevated 2 feet, with underpinning free, or to be surrounded at their perimeter by concrete wall extending 2 feet below the surface of the ground and fitting flush to the floor of the house; the requirements for the rat proofing of any place that kept provisions, such as groceries, bakeries, markets, etc., by concrete floor and walls, the latter extending 2 feet below the ground level and 1 foot above the floor level; a rat-proofing section for stables and a section for rat proofing chicken pens. Likewise the section for rat proofing of future constructions was changed, giving specific requirements for elevation with free underpinning or requiring concrete floor and walls. The operation of this law will be referred to in another paragraph.

Proper blank form was provided by the attorney general with the paragraph containing penalty for violation thereof printed on the reverse side. Three thousand traps of a picked pattern were cabled for—1,500 cage and 1,500 snap traps. This number was augmented

by a similar number in the latter part of July, and again in August so that 9,000 traps were used throughout the island. A suitable building was secured as an office, and blank forms for inspection reports, laboratory reports, rat reports, etc., were devised.

In response to a cable request Asst. Surg. J. R. Ridlon and Pharmacist F. L. Brown were ordered to San Juan for duty in connection with plague-suppression measures.

A special laboratory for the examination of rodents had been put in operation on June 30 by Maj. F. F. Russell, of the United States Army. The building was well isolated and admirably located for this work and had been selected in the latter part of June by Surg. S. B. Grubbs and Dr. W. F. Lippitt. Upon his arrival, Asst. Surg. Ridlon was placed in charge of this laboratory, assisted by Acting Asst. Surg. F. J. Hernández. On August 26 Asst. Surg. Ridlon was ordered to take charge of the service operation in Mayaguez. He was succeeded in the laboratory by Passed Asst. Surg. C. W. Chapin, who had been ordered to San Juan by the bureau for that purpose. Arrangements were made with the department of sanitation for the preparation in the department laboratory of arsenic and phosphorus poison.

Thus in the second week of July an organization fully equipped for the eradication of plague was set to work.

Due to the excellent preliminary work performed by the local sanitary department it was possible to institute at once the eradicative measures of rat proofing, widespread trapping and poisoning, and inspection of outgoing freight.

Disinfection was not employed, being considered a waste of time and money. All outbound freight was either unpacked and examined or treated by sulphur fumigation in an especially constructed sulphur chamber. The disinfection of personnel was ignored as not being pertinent to antiplague measures.

The destruction of buildings was considered as unjustifiable in a general way, unless done by the owner in preference to rat proofing. There were a few exceptions to this policy, notably one infected house in Carolina, the thick adobe walls of which were riddled with rat runs. The immediate destruction of rat harborage on any premises on which a plague-infected rodent was taken was considered of paramount importance, considerably more so, in fact, than the treatment of buildings in which human cases occurred, though both contingencies were considered as meriting prompt action.

On removing flooring the space beneath was drenched with petroleum. The Haffkinization of the population was not undertaken by the service, inasmuch as the value of this procedure has not been sufficiently demonstrated to justify the expenditure of labor and money when more effective measures are available. The work done by the service can best be described under the headings of "Rat-

proofing," "Rat trapping and poisoning," "Freight inspection," "Laboratory examination of rats," and "House inspection for enforcement of garbage disposal and the maintenance of premises free of rat harbors."

Rat Proofing.

Under Appendix I can be observed the provisions of the rat-proofing law. The city of San Juan, with its barrios of Santurce, Puerta de Tierra, and those parts of the town known as La Marina and La Perla were divided into eight districts, and an inspector was assigned to each one. Owing to the inexperience of these men, special instruction and field demonstration were necessary in the earlier days of the work. In this way your representative personally inspected and indicated structural changes, when necessary, for rat proofing of all buildings in Puerta de Tierra, the Marina, La Perla, and a great many in the old city and in Santurce. Similar instructions were given to the assistant sanitary engineer of the insular department who, later on, attended to the rat-proofing procedure for the inland towns. Inasmuch as repairs incident to rat proofing would involve sums of money from a few dollars in some buildings to two or three thousand in others, it was deemed advisable to have each inspector thoroughly grounded in the knowledge of his duties. Before being intrusted with any discretionary power each inspector was peronally instructed in all the minutiæ of rat proofing.

OLD CITY.

In addition to the eight inspectors, two men were employed as special inspectors to supervise the rat proofing of the old city where predominated the type of construction locally known as "mamposteria" and similar in type to the well-known adobe material. Both were long experienced in structural work, and one was a graduate engineer. After receiving instructions as to their specific duties, both of these men, Mr. Eugene Chase and Mr. Martin Paniagua, did most excellent work, as indeed did all the other inspectors except two or three who were discharged for incompetency. Aside from containing a type of building that, because of its soft adobe walls, furnished harborage for rats on a large scale, the old city contained the docks, warehouses, and the majority of the large groceries and markets. San Juan, being the main port and the big distributing point for the island, contains warehouses and large storehouses of provisions greatly in excess of its urban population. It has two or three times the number of these places usually seen in cities having the population of San Juan, which is estimated to be 50,000.

The question of rat proofing the mamposteria construction was a serious problem. Though this construction is somewhat different

from the "pukka" houses in India, the description of buildings in Bombay by the Indian Plague Commission, both as to the nature of the material and the degree of rat infestation, makes the similarity of construction in Bombay and San Juan very striking. In one building of this material two cases of plague acquired their infection, and, on destroying the walls, which were 2 or 3 feet thick, nine rats were taken from their interior. The necessity, therefore, for rat proofing this kind of building was imperative.

The term "mamposteria" is rather comprehensive, embracing several different kinds of construction. "Mamposteria antigua" (old mamposteria), also known as "mamposteria concentrada," is composed of a mixture of clay, crushed brick, and lime. The walls of this material are generally 2 or 3 feet thick and do not extend below the ground. Its durability depends upon the exclusion of moisture, and for this purpose there is applied an outer capping of plaster. From year to year, as this outer coating wears off, it is replaced by a new veneer. If moisture gains access to the interior of the walls, the mixture loses its adhesive qualities and disintegrates.

The material of the old mamposteria as built by the Government formed a composition that was of enduring hardness, but the commercial edifices were differently made, so that many of the latter, despite the thickness of the walls, or rather by reason of the same, furnished excellent rat harborage, being quite pervious to the passage of rats. With a penknife a hole could easily be made through the walls of some of the San Juan buildings. Brick buildings are likewise called mamposteria. Some few of them, of more recent construction, are of kiln-burnt brick, well laid in cement mortar. These were found to be rat proof, except in those structures that possessed no foundation walls. Other brick buildings, however, are of soft sun-dried brick, laid in a mixture of clay, sand, and lime, or clay only. This construction was likewise often observed to be perforated by rat runs. It was thus impossible to make the old city completely rat proof save by demolition of these buildings—an economic impossibility.

An expedient, however, was adopted that made the majority of mamposteria structures comparatively rat proof. This embraced the requirement of a concrete floor, in all places that contained provisions, with a 4-inch capping on the soft walls extending 2 feet into the ground and upward above the floor level. For warehouses and wholesale groceries, this capping extended upward 4 feet. For smaller groceries, restaurants, and similar places where the walls were always exposed to view, the facing was required to be of only 1 foot in height. In this way, should a rat escape from a hole above the capping and descend to the floor it could not regain its former abode. Likewise, any rat hole well up from the floor level could be easily seen and closed, whereas lower down it might escape notice. The

heavy facing also protected the walls at the lower points where heavy articles of merchandise would most frequently break a veneer of cement or lime mortar and give entrance to a rodent.

This capping provoked some opposition. Many of the people could not understand that mere breadth of the wall was no bar to ingress of rodents, but on the contrary furnished increased rat harborage. The very evidence of rat holes seldom seemed to offset the argument that the walls had withstood earthquake shocks and the onslaught of time, and consequently ought to exclude rats. With few exceptions, however, the majority of owners obeyed instructions for rat proofing with alacrity and good will.

Another source of trouble was the Canary Island tiling, which was used almost exclusively as flooring in the San Juan warehouses and large provision stores. These broad flagstones are very brittle and soon become cracked and broken if heavy boxes or barrels are thrown upon them. Especially was it noticed that the corners were most frequently chipped off, permitting the passage of rats, which quickly burrowed and undermined the whole floor space. Unless relaid in cement these tiles were required to be replaced by concrete flooring

Within the confines of the old city mamposteria structures, such as well-kept dwellings, together with office buildings and retail shops not dedicated to storage or sale of foodstuffs, were exempted, provided there was no evidence of rodent infestation. Those dwellings that corresponded to tenements, with many families herded together, were required to cap the walls and repair the floors. The older part of San Juan contained not a few of these places, generally one family to a room, overcrowded and squalid, with plenty of garbage to attract rats. The patio, or inside court, that obtains in most of the old San Juan buildings, likewise required treatment when connected with a food depot. However rat proof the walls and floor of such a place, the wires and water tubes leading from the roof and the upper story would permit the easy access of rats. The method resorted to in making rat proof these wires and tubes consisted in protecting them by a galvanized-iron collar at the junction of the first and second floors, similar to the rat guards on ship hawsers. Doors and windows were likewise made rat proof where it was possible for a rat to gain entrance to a food depot—the windows being screened with one-half-inch wire mesh. Where doors did not fit snugly, but had a space of an inch or more from the floor, a strip of sheet iron was fastened to the door or the height of the sill raised.

LA MARINA.

This district includes the docks, the large warehouses, and some dwellings. It lies along the water front. The San Juan docks are known as Pier 1, Pier 2, "Old Quartermaster's Dock," and San Antonio Dock.

The two former are constructed as piers. The outer end, where ships lie alongside and discharge cargo, has reenforced concrete floor, protected by galvanized-iron roof and walls. At the end adjoining the shore are located the offices, extending the width of the dock on each side of the entrance. In making these two docks rat proof the doors were so repaired as to fit tightly and were required to be closed at night. The wooden floors of the offices were replaced by concrete, and the double walls were rat proofed by concrete filling at the bottom and heavy timbers at the top. The side of the dock connected with the land was made impervious to the passage of rats by increasing the depth of the walls by a 2-foot concrete foundation. At the juncture of the dock with the land a V-shaped piece of sheet iron extended outward over the water on both sides of the dock, so that a rat could not gain access to the dock by running along the sides. In addition to this the dock space was required to be cleared of all cargo once a week.

The San Antonio Dock presented a different problem. It comprised a very large area of newly made land that, constantly settling, prevented the laying of any concrete floors. It had a galvanized-iron roof and walls, with the bare earth as floor. This place was rat-proofed by a marginal wall of concrete on all sides. On the interior the floor space was divided into some 16 compartments, separated by galvanized-iron partitions sunk 2 feet into the ground and extending upward 4 feet. One compartment is required to be cleared of cargo once in two weeks. At such times the transfer of cargo is effected between sunrise and sunset, so that any rats, if present, penned in by the iron walls can not escape, and are caught and killed. This procedure serves not only to catch any rodents that are present, but is an ever-present indication of the degree of rat population in that place.

The old Quartermaster's Dock has been partly abandoned, being chiefly used in the sugar season when ships come alongside to be loaded with that commodity. Being in disuse in July, the entire plank flooring was removed, leaving the bare ground. Subsequently the railroad company built concrete walls and floor.

All warehouses in the Marina were compelled to put in concrete floor and walls; indeed, on account of the proximity to the docks and the water front, all buildings in this district, whether warehouses and stores, markets or dwellings, were required to have concrete floor and walls.

LA PERLA.

This collection of small hovels was situated below the walls of the old city near the municipal slaughterhouse. Five cases of plague occurred there. With the exception of two or three food depots, rat proofing was accomplished by elevation. The food depots were treated as elsewhere.

La Perla, being situated on a steep inclination, had a number of cellar habitations—one room dug out under a house and boarded up, the floor of the superimposed house comprising the ceiling. These were all ordered destroyed. Prior to the execution of this, however, a case of plague developed in one of these dugouts.

Several small shacks connected with the slaughterhouse were destroyed by the city in preference to rat proofing them. The slaughterhouse itself was made rat proof by placing a wire mesh over the windows, correcting the fit of the doors, and making concrete walls to an annex, the floor of the main building having been constructed of concrete.

TABLE I.—*San Juan (old city), La Perla, and La Marina.*

Food depots	203
Piers and wharves	4
Dwellings	735
Stores and buildings of miscellaneous nature	125
Stables	8
Total buildings	1,075

RAT PROOFED.

Food depots	183
Piers and wharves	4
Dwellings	706
Stores and buildings of miscellaneous nature	10
Stables	8
In process of compliance	33
Noncompliant	132

NOTE.—There were 20 food depots listed among the number "Noncompliant" or "In process of compliance"; only 3 were food depots on a large scale. Most of the remaining 17 were either bar, delicatessen or confectionery stores, and the majority of them are of the 33 listed as "In process of compliance."

Of the 132 marked "Noncompliant" the majority belong to the classification "Stores and buildings of a miscellaneous nature," which included shops devoted to dry goods, clothing, shoes, etc., or office buildings. Very few of them harbor rats.

Of the amount spent on rat proofing in the old city, $100,000 represents reconstructions on a large scale, far exceeding in magnitude the rat proofing repairs ordered, though embracing them.

PUERTA DE TIERRA.

This barrio of the municipality is separated from the old city by a quarter of a mile of unbuilt-upon land except for one or two buildings belonging to the railroad company. For the most part this district is populated by a class of people totally indifferent to every law of hygiene. They live, as a rule, in squalor, and the premises, even at this date, are with difficulty kept free from garbage. Before the epidemic this was not attempted. Frame dwellings prevail in Puerta de Tierra, though there are three or four brick buildings, and since the rat proofing has been in progress several concrete structures have been erected.

This section can be divided for purposes of description into the northern and southern part. The former stretches along the municipal highway known as the Carretera and along San Agustin Street. Practically all cases in Puerta de Tierra were along San Agustin Street. The congestion of houses in Puerta de Tierra is very great and frame tenements abound. Facing San Agustin the majority of buildings are food depots. These were required to have concrete floors and walls. Dwellings of all sizes are crowded into the rear of these premises, and it was in these interior structures that the greater part of the cases of plague occurred. On account of this condition a large majority of the houses were without a number. To obviate the confusion arising therefrom in the first days of the epidemic, at the suggestion of Surg. Grubbs it was planned to give each house a special number. Under the service management this work was completed and each building was designated by a card bearing the district and house number tacked on to the building.

The houses along the Carretera differed from those along San Agustin, chiefly in being for the most part dwellings and having a large number of basement habitations. Any owner whose house had 4 feet of space or more beneath the flooring had constructed dwellings there without proper light, ventilation, or air space. A number of these places were evacuated; some ordered destroyed as being part of the underpinning of the house above and others ordered to be remodeled. The latter procedure embraced the construction of concrete floors and walls and was permitted because of the existing poor housing facilities.

The southern part of Puerta de Tierra is entirely composed of small frame shacks. The population there is chiefly composed of day laborers, and the houses are very close together. Some of the houses at the beginning of the epidemic were close to the ground, but being located, for the most part, at the margin of the bay and on swampy ground that is inundated at high tide, most of the shacks were originally built elevated. It might seem that this shore-line

section would be the first to suffer from the ravages of a plague epidemic. As a matter of fact, the swampy nature of the ground, which prevented rat burrowing, and the elevated construction of the buildings operated for the salvation of these people. Only one case of plague developed in these subbarrios, and that one in August.

On the first appearance of the epidemic, employees of the police and sanitary departments destroyed 50 houses. What made house raising difficult in the early days of the epidemic was the fact that there were practically no jacks in San Juan. In July, the Porto Rico Railway, Light & Power Co. loaned a few jacks to this office, and these were turned over to the poor people in these subbarrios, who raised their own houses. Altogether, there were 441 houses raised in this manner.

Most of the stables were located in Puerta de Tierra. These structures in Porto Rico consist only of the floor and the roof, with supporting timbers, so it was not practicable to make them inaccessible to rodents. They were required, however, to have a concrete floor protected by side walls 2 feet in depth, the crib to stand well removed from all uprights, with a flare from below upward and covered on the outer side by galvanized iron. All grain was required to be kept in rat-proof boxes or houses.

It may be stated that in Porto Rico stables were found not to be the rat harbors they are in the United States, possibly for the reason that grass is chiefly used as feed, with very little grain.

In Puerta de Tierra the worst rat harbors, especially the food depots and many of the dwellings, were completely rat proofed by the latter part of July and early August. This work was practically all finished and Puerta de Tierra rat proof in September, though many small items of the work and repairs were not completed until November.

The insular sanitation service maintained a special force of men in Puerta de Tierra, who kept the streets and premises clean of refuse and garbage, a very great help to the rat-trapping force. In all Puerta de Tierra there were 1,127 buildings; 848 of these were rat proofed, the others not requiring such measures.

Table II gives classification of buildings, with nature and cost of same:

TABLE II.

Food depots	69
Dwellings	1,006
Stables	44
Miscellaneous buildings	8
Total number of buildings in Puerta de Tierra	1,127

RAT PROOFED.

Food depots, concrete floor and walls	69
Dwellings:	
By concrete walls	170
By elevation	507
Stables rat proofed or destroyed by owner	44
Miscellaneous	8
Shacks destroyed by insular government	50
	848
Dwellings considered rat proof by reason of elevated construction	379
Total (cost $80,487.27)	1,127

SANTURCE.

With the exception of several small subbarrios, Santurce is the better residence part of the city. It contains comparatively few food depots such as groceries, markets, bakeries, etc., and the dwellings are well kept, the householders keeping their premises clean and free from garbage and refuse. Fourteen cases of human plague developed in Santurce, and 12 infected rats were caught. Subbarrios Gandul, Alto del Cabro, Minilla, Melilla, and Campo Alegre contain many small shacks similar to those in south Puerta de Tierra. Fortunately in these places the ground was very marshy or sandy—a light shifting sand that prevents the rodents from burrowing. Both of these factors made for low rat population, with the subsequent facilitation of plague eradicative measures.

Table III gives classification of buildings, rat-proofing procedure, and cost. In the outskirts of Santurce were several districts known as Machuchal, Chicharo, and Seboruco. There were a number of shacks in these parts without floors and with thatched roofs. As much for general sanitation as for plague considerations, the owners were required to replace the straw roof by galvanized iron and build an elevated floor. About 100 of these structures were so treated.

TABLE III.

Food depots	142
Dwellings	2,961
Stables	28
Miscellaneous buildings	39
Total number of buildings in Santurce	3,170

RAT PROOFED.

Food depots, concrete floor and walls	142
Dwellings:	
By concrete walls	219
By elevation	622
Stables rat proofed or destroyed by owner	28
Miscellaneous	39
Total (cost, $57,713.57)	1,050
Dwellings considered rat proof by reason of an elevated construction	1,869
Noncompliant (dwellings)	251
Total	3,170

NOTE.—The 251 dwellings listed "noncompliant" were so recorded because they had less elevation than that required by the rat-proofing law. Most of them had some elevation, and very few furnish potential rat harborage.

Rat Proofing Public Buildings.

The rat proofing of public buildings was given the same attention as private property. The interested cooperation of the different Insular and Federal Government officials served to effect the rat proofing of most of the Government constructions where the procedure was needed.

Under the direction of the collector of customs the customs service expended $3,092.84 in making the San Juan customs warehouses and property rat proof. Authorization was obtained from the Treasury Department for the expenditure of $10,380. 71 in rat proofing property of the customs service in Ponce, Mayaguez, and the other Porto Rican ports.

The War Department authorized rat-proofing work, chiefly in the nature of concrete stables, to the amount of $5,000 exclusive of the labor involved.

By reason of the active interest of the Governor of Porto Rico, the insular government expended $7,758.48 on rat-proofing work. The repairs to several Government buildings are still pending because of the expected transfer of authority from the Federal to the Insular Government.

The rat proofing of several parts of the old fortification walls around San Juan has been the cause of more or less correspondence between San Juan and Washington. It is probable that the work will eventually be done.

Legal Procedures.

While the great majority of people complied with the rat-proofing requirements as soon as ordered, it was necessary to refer some cases to court. As usual, these transgressors were chiefly among the landlord class, the ones who could best afford the expenditure.

Some of the defendants were fined, the amounts varying from $10 to $100; others discharged by request because of having complied before trial.

The city and district courts of Porto Rico, on account of the vigor with which the judges administered the law, gave very great aid to service operations, and the rat-proofing work was greatly expedited by the efficient and energetic way the cases were prosecuted by the attorney general and his assistants.

In all, 166 cases were referred to court with satisfactory results.

Inspection of Inland-Bound Freight.

Inspectors were stationed at various points in San Juan, so that all merchandise bound for interior points of the island could be inspected and examined or fumigated. These inspection stations were at the railroad freight warehouses, the docks, the ferry station, the express office, and the exit of the highway from San Juan. All articles that could harbor a rat were either unpacked or were subjected to a sulphur fumigation. This last-named procedure was practiced exclusively at the railroad warehouse, where a large sulphur fumigation chamber was built.

All cars leaving San Juan were inspected and required to be rat proof before being used. All dead spaces such as existed between double planking were made tight and inaccessible to rodents. Breaks in car floors or in the side walls were repaired, and windows were made rat proof. All cars when loaded, or if partially loaded and left standing on track over night, were sealed by an inspector. Because of the difficulty in obtaining reliable employees for this inspection work, and the urgency of seeing that different branches of the organization effectively performed their duties, one point at which supervision should have been instituted without loss of time was neglected. The inspector for cars at the San Antonio Dock and surrounding freight yard was not put on duty till July 15. This unfortunate omission may have been responsible for the infection of the Dorado case and the transportation of plague infection to Arecibo. The facts bearing on this possibility will be referred to later on.

This supervision of freight was discontinued December 1. Altogether, 57 rodents were taken from merchandise. Those that were probably killed by fumigation and remained within the packages might have increased the sum total.

To estimate the efficiency of this inspection, the director of sanitation was requested, in October, to make inquiry of the different island health officers as to rodent infestation of freight coming from San Juan. Though several replies stated that rodents had been observed in freight and in cars from San Juan before and during the first days of

the epidemic, none had been seen since initiation of inspection. The notice of rats escaping from cars in the first part of the epidemic was mentioned with some emphasis in the town of Caguas. The total number of pieces of freight inspected up to December 1, was 397,708. This embraced those that were repacked by the inspection force. The number of cars inspected was 2,683; number of pieces of freight fumigated, 15,620.

TABLE IV.

Rodents taken from merchandise	57
Cars inspected	2,683
Oxcarts carrying inland-bound freight inspected	6,075
Pieces of freight fumigated	15,620
Pieces of freight inspected (including those repacked)	397,708

Trapping and poisoning of rodents.

As soon as the service plan of organization was decided upon, it was ascertained that the local market at most could supply but slightly over 100 traps. A cable order was sent to the States for 1,500 snap traps and 1,500 cage traps of a selected pattern. In the meantime the entire local supply was purchased. In all, about 2,500 traps were assigned to San Juan, it being considered that each trapper could attend to 60 traps. Later on this number was increased to 9,000 traps. Four or five thousand were sent to different points outside of San Juan.

The method of trapping did not differ from service methods used in San Francisco. For this part of eradicative work the municipality was divided into 10 districts, one foreman and four men being assigned to each. Later on, as rats became scarce, additional foremen were employed, one foreman to two trappers. Each trapper was paid a bounty for each rat caught in addition to his salary. In certain parts of the estuaries bordering on Puerta de Tierra and Santurce rats make nests, live and breed, in the swamp shrubbery known as the "mangle." When the tide recedes the rats make widespread excursions in search of food, returning to their nests, or the branches of the shrubbery, when the tide is flooding. To destroy these rats, not only were traps and poison used, but some of the employees also used rifles, going out in boats at high tide. Where possible the shrubbery was cut down.

In the first week of July in the entire city 72 rats were captured, a daily catch of about 10; in the second week, 294, a daily average of 42. The number increased daily up to the latter part of July, when on July 28 the maximum catch was attained—178 rodents. A diminution in the rat catch commenced the first week in August and continued steadily, so that in September it had dropped to about half; in October and November it had fallen to one-fifth, the daily average

for the week November 1 to 7 being 28. The lowering of the rat population was effected by the combined rat catching and poisoning, the success of which was due to rat proofing. The steady decrease in captured rodents was most marked in Puerta de Tierra where earliest and most careful attention was given to rat proofing. A separate record for each district was not commenced until July 10. In the week, July 10 to 16, 95 rats were trapped in Puerta de Tierra. During the last week in July the catch for this district was 205.

On September 11, when the rat catch in Puerta de Tierra had fallen to 22 per cent of the July maximum, the last two infected rodents were trapped in that barrio. This decrease is all the more accentuated by the fact that the trappers were week by week becoming more experienced, the number of foremen in September being doubled so that the supervision was more strict, and the rat bounty was increased from 5 to 10 cents with an offer of $1 for any infected rat taken. All these factors would naturally operate to cause an increase in the number of rats trapped, so that from a comparative estimate it would seem that the percentage of reduction was really greater than is indicated by the actual number of rodents caught.

The last case of plague in the municipality occurred on September 13, when the daily rat catch in the entire city had fallen to 50 per cent of the earlier maximum catch. Between the early morning hours, when the trappers turned in their catch, and the afternoon hours, when traps were baited, the men distributed poison. Arsenic and phosphorus poisons made in the insular chemical laboratory were used. Six hundred pounds of poison were thus distributed between July 1 and January 1.

As to the details of trapping: Each foreman was assigned a fixed district. In turn he would so place his trappers that there was no duplication of labor or trapping in the same territory. Each foreman was personally held responsible for the traps, and he made his trappers responsible to him for the property intrusted to them. The foreman kept a list of the location of every trap in his district, and by daily rounds with the trappers verified the location and saw that the trapper was promptly attending to his duties. A supervising inspector had charge of the foremen and made rounds of inspection. Despite these precautions, however, it can not be said that the work of the trappers has been satisfactory owing to the difficulty of getting competent men to do the work. There were a few exceptions. Altogether there were 269 rat trappers employed in San Juan from the beginning of the work up to February 15, though this force did not exceed at any one time 40 men for the city.

Under the subheading of "Extension of eradicative and preventive measures to points outside of San Juan" mention will be made of trapping and poisoning in other island towns.

TABLE V.—*Classification of all rodents examined in Porto Rico from June 23, 1912, to Feb. 15, 1913.*

Mus norvegicus	26,532
Mus rattus	4,514
Mus alexandrinus	7,933
Mus musculus	6,533
Mongoose	258
Unclassified	309
Total	46,079

NOTE.—The unclassified were those examined during the first week of laboratory examination.

TABLE VI.—*Weekly rat catch in Puerta de Tierra.*

[All dates inclusive.]

	Rats.	Mice.		Rats.	Mice.
July 10 to 13	15	.....	Nov. 3 to 9	30	47
July 14 to 20	193	5	Nov. 10 to 16	21	35
July 21 to 27	176	.....	Nov. 17 to 23	29	60
July 28 to Aug. 3	174	.....	Nov. 24 to 30	31	47
Aug. 4 to 10	154	.....	Dec. 1 to 7	20	57
Aug. 11 to 17	136	.....	Dec. 8 to 14	45	64
Aug. 18 to 24	102	.....	Dec. 15 to 21	20	68
Aug. 25 to 31	98	7	Dec. 22 to 28	10	98
Sept. 1 to 7	41	7	Dec. 29 to Jan. 4	20	70
Sept. 8 to 14	58	13	Jan. 5 to 11	14	126
Sept. 15 to 21	49	34	Jan. 12 to 18	34	99
Sept. 22 to 28	51	21	Jan. 19 to 25	28	98
Sept. 29 to Oct. 5	39	27	Jan. 26 to Feb. 1	14	76
Oct. 6 to 12	48	43	Feb. 2 to 8	28	57
Oct. 13 to 19	33	92	Feb. 9 to 15	18	80
Oct. 20 to 26	26	78			
Oct. 27 to Nov. 2	38	7	Total	1,793	1,416

TABLE VII.—*Weekly rat catch in Santurce.*

	Rats.	Mice.		Rats.	Mice.
July 10 to 13	94	41	Nov. 3 to 9	154	9
July 14 to 20	160	6	Nov. 10 to 16	142	16
July 21 to 27	178	.....	Nov. 17 to 23	92	29
July 28 to Aug. 3	297	.....	Nov. 24 to 30	87	25
Aug. 4 to 10	276	.....	Dec. 1 to 7	108	31
Aug. 11 to 17	240	.....	Dec. 8 to 14	110	40
Aug. 18 to 24	255	.....	Dec. 15 to 21	124	64
Aug. 25 to 31	299	8	Dec. 22 to 28	74	76
Sept. 1 to 7	319	14	Dec. 29 to Jan. 4	107	84
Sept. 8 to 14	336	9	Jan. 5 to 11	94	68
Sept. 15 to 21	342	8	Jan. 12 to 18	144	74
Sept. 22 to 28	341	13	Jan. 19 to 25	118	92
Sept. 29 to Oct. 5	308	12	Jan. 26 to Feb. 1	185	72
Oct. 6 to 12	254	3	Feb. 2 to 8	168	75
Oct. 13 to 19	281	20	Feb. 9 to 15	206	67
Oct. 20 to 26	208	14			
Oct. 27 to Nov. 2	222	10	Total	6.323	990

TABLE VIII.—*Weekly rat catch in San Juan (the old city, Marina, and La Perla).*

	Rats.	Mice.		Rats.	Mice.
July 10 to 13	15	8	Sept. 15 to 21	179	7
July 14 to 20	121	6	Sept. 22 to 28	184	23
July 21 to 27	322	.....	Sept. 29 to Oct. 5	102	33
July 28 to Aug. 3	357	.....	Oct. 6 to 12	145	38
Aug. 4 to 10	363	.....	Oct. 13 to 19	143	59
Aug. 11 to 17	257	.....	Oct. 20 to 26	82	19
Aug. 18 to 24	233	.....	Oct. 27 to Nov. 2	77	48
Aug. 25 to 31	198	15	Nov. 3 to 9	59	6
Sept. 1 to 7	166	20	Nov. 10 to 16	57	56
Sept. 8 to 14	131	30	Nov. 17 to 23	85	57

TABLE VIII.—*Weekly rat catch in San Juan (the old city, Marina, and La Perla)*—Con.

	Rats.	Mice.		Rats.	Mice.
Nov. 24 to 30	81	44	Jan. 12 to 18	100	70
Dec. 1 to 7	122	36	Jan. 19 to 25	134	83
Dec. 8 to 14	73	55	Jan. 26 to Feb. 1	93	98
Dec. 15 to 21	152	92	Feb. 2 to 8	93	72
Dec. 22 to 28	97	96	Feb. 9 to 15	119	66
Dec. 29 to Jan. 4	68	70			
Jan. 5 to 11	82	55	Total	4,490	1,262

NOTE.—The record for the weekly rat catch by districts in the municipality was not started until July 10.

TABLE IX—*Weekly rat catch in San Juan, Santurce, and Puerta de Tierra.*

	Rats.	Mice.		Rats.	Mice.
July 2 to 6	56	.....			
July 7 to 13	160	49	Nov. 3 to 9	243	62
July 14 to 20	488	12	Nov. 10 to 16	220	107
July 21 to 27	685	.....	Nov. 17 to 23	206	146
July 28 to Aug. 3	828	.....	Nov. 24 to 30	199	116
Aug. 4 to 10	793	.....	Dec. 1 to 7	250	124
Aug. 11 to 17	633	.....	Dec. 8 to 14	229	159
Aug. 18 to 24	590	.....	Dec. 15 to 21	296	224
Aug. 25 to 31	595	30	Dec. 22 to 28	180	270
Sept. 1 to 7	526	41	Dec. 29 to Jan. 4	195	224
Sept. 8 to 14	525	52	Jan. 5 to 11	190	249
Sept. 15 to 21	570	49	Jan. 12 to 18	278	245
Sept. 22 to 28	576	57	Jan. 19 to 25	280	273
Sept. 29 to Oct. 5	449	72	Jan. 26 to Feb. 1	292	246
Oct. 6 to 12	447	84	Feb. 2 to 8	289	204
Oct. 13 to 19	465	171	Feb. 9 to 15	344	213
Oct. 20 to 26	316	101			
Oct. 27 to Nov. 2	334	65	Total	12,947	3,665

NOTE.—Figures for latter part of June and early July do not indicate total number of rodents destroyed or examined, as many rodents were killed by citizens, some being sent to the laboratory.

Source of all rodents examined in the laboratory from June 23, 1912, to Feb. 15, 1913.

Towns.	Rats and mice.	Mongoose.	Towns.	Rats and mice.	Mongoose.
Aibonito	12	.....	Naguabo	21	.....
Adjuntas	6	.....	Penuelas	5	.....
Aguada	4	.....	Ponce	3,304	4
Aguas Buenas	5	.....	Rio Piedras	1,895	26
Arroyo	3	.....	Rincon	3	.....
Anasco	13	.....	San Juan:		
Aguadilla	507	.....	Puerta de Tierra... 5,176		
Arecibo	3,157	2	Santurce 8,918		
Barceloneta	15	.....	San Juan 5,707		
Bayamon	1,883	4		19,801	180
Catano	44	.....	Rio Grande	43	.....
Camuy	4	.....	Steamship Brazos	119	.....
Comerio	21	.....	Steamship Carolina	26	.....
Cabo Rojo	2	.....	Steamship Ponce	19	.....
Carolina	2,000	1	Steamship Hostilius	8	.....
Caguas	2,445	25	Steamship Luckenbach	1	.....
Coamo	9	.....	Schooner Henry Kregse	14	.....
Cayey	15	.....	Schooner Sylvia Hall	11	.....
Dorado	49	.....	San German	36	.....
Fajardo	12	.....	San Sebastian	29	.....
Guaynabo	6	.....	Salinas	9	.....
Guayanilla	1	.....	Santa Isabel	4	.....
Gurabo	19	.....	Sabana Grande	18	.....
Guayama	5	.....	San Lorenzo	5	.....
Humacao	17	.....	Toa Baja	6	.....
Juncos	11	.....	Toa Alta	5	.....
Loiza	32	.....	Yauco	535	.....
Lares	30	.....	Yabucoa	10	.....
Las Marias	6	.....	Vega Alta	6	.....
Lajas	21	.....	Vega Baja	16	.....
Moca	168	.....			
Manati	600	.....	Total	45,821	258
Mayaguez	8,798	16			

[NOTE.—To be continued in next issue.]

Fig. 1.—MAP OF PORTO RICO, SHOWING LOCALITIES IN WHICH PLAGUE INFECTION OCCURRED.

Fig. 2.—AN EXAMPLE OF THE "MAMPOSTERIA" (BRICK AND MUD MASONRY) WALLS OF THE "OLD CITY" IN SAN JUAN RIDDLED WITH RAT HOLES.

Fig. 3.—FRAME WAREHOUSE ON WATER FRONT, SAN JUAN, SUBSEQUENTLY TORN DOWN AND REPLACED BY REENFORCED CONCRETE BUILDING.

Fig. 4.—INTERIOR VIEW OF SAN ANTONIO DOCK, SHOWING APARTMENTS PARTITIONED OFF BY GALVANIZED IRON.

Fig. 5.—SECTION OF PUERTA DE TIERRA, SHOWING CONGESTION OF BUILDINGS.

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.

State Reports for April, 1913.

Places.	Number of new cases reported during month.	Deaths.	Vaccination history of cases.			
			Number vaccinated within 7 years preceding attack.	Number last vaccinated more than 7 years preceding attack.	Number never successfully vaccinated.	Vaccination history not obtained or uncertain.
California:						
Alameda County—						
Alameda	2					2
Oakland	2				2	
Butte County—						
Chico	6		3		3	
Rural	12					12
Calaveras County—						
Campo Seco	4					4
Fosteria district	3					3
Eldorado County—						
Diamond Springs	1				1	
Humboldt County—						
Loleta	1					1
Imperial County—						
Rural	6	1		1	5	
Kern County—						
Bakersfield	3				3	
Maricopa	1				1	
Rural	2					2
Los Angeles County—						
Long Beach	1				1	
Lordsburg	1				1	
Los Angeles	10			1	2	7
Monrovia	1				1	
Pasadena	1				1	
Marin County—						
Mill Valley	3				3	
Placer County—						
Auburn	1				1	
Riverside County—						
Riverside	1				1	
Rural	1				1	
Sacramento County—						
Sacramento	13				13	
Nimbus	1				1	
Rural	2					2
San Diego County—						
San Diego	6				3	3
San Francisco County—						
San Francisco	5					5
San Joaquin County—						
Lodi	1				1	
Stockton	8		1		3	4
Santa Clara County—						
San Jose	1				1	
Total	100	1	4	2	49	45
Maryland, exclusive of Baltimore city:						
Anne Arundel County—						
Annapolis	1				1	
Germantown	7			2	5	
Frederick County—						
Brunswick	1				1	
Garrett County—						
Swanton	1				1	

SMALLPOX—Continued.

State Reports for April, 1913—Continued.

Places.	Number of new cases reported during month.	Deaths.	Vaccination history of cases.			
			Number vaccinated within seven years preceding attack.	Number last vaccinated more than seven years preceding attack.	Number never successfully vaccinated.	Vaccination history not obtained or uncertain.
Maryland, exclusive of Baltimore city—Continued.						
Montgomery County—						
Norbeck	1				1	
Olney	1				1	
Total	12			2	10	
New York:						
Albany County	1			1		
Chenango County	1			1		
Chemung County—						
Elmira	3				3	
Clinton County	1			1		
Plattsburg	17			6	11	
Delaware County	3			2	1	
Dutchess County	2			1	1	
Erie County—						
Buffalo	2			1	1	
Franklin County	24			1	23	
Genesee County	2				2	
Herkimer County	4			3	1	
Little Falls	2				2	
Jefferson County	1				1	
Lewis County	1			1		
Madison County	7				6	1
Oneida	2				2	
Montgomery County	6				6	
Amsterdam	1				1	
Niagara County	1				1	
Niagara Falls	3			1	2	
North Tonawanda	1				1	
Oneida County	5			2	3	
Utica	1					1
Onondaga County	1				1	
Syracuse	2				2	
Oswego County	12			4	8	
St. Lawrence County	15			6	9	
Steuben County	1			1		
Total	122			32	88	2
Wisconsin:						
Brown County	58		1		34	23
Clark County	1					1
Columbia County	71		6	65		
Dane County	3					3
Dodge County	2					2
Douglas County	1					1
Fond du Lac County	2					2
Forest County	1					1
Jefferson County	4				2	2
La Crosse County	6		1		4	1
Lincoln County	1					1
Manitowoc County	2					2
Marathon County	6				3	3
Marinette County	1					1
Milwaukee County	44					44
Monroe County	1					1
Oconto County	2					2
Rock County	2				1	1
Rusk County	3					3
Shawano County	9		5	3		1
St. Croix County	3				1	2
Washington County	2					2
Waukesha County	4		1		1	2
Winnebago County	15		1	3	11	
Wood County	13				5	8
Total	257		15	71	62	109

California—Los Angeles.

Senior Surg. Brooks, of the Public Health Service, reported by telegraph that during the week ended May 24, 1913, 3 cases of smallpox had been notified in Los Angeles, Cal.

California—San Francisco.

Surg. Long, of the Public Health Service, reported by telegraph that during the week ended May 24, 1913, 2 cases of smallpox had been notified in San Francisco, Cal.

Maryland—Chillum and Ellicott City.

The State Board of Health of Maryland reported by telegraph that 2 new foci of smallpox infection had occurred in Maryland, 1 case of the disease having been notified at Chillum, Prince Georges County, on May 23, and 1 case at Ellicott City, Howard County, May 27, 1913.

Oregon—Grand Ronde.

Acting Asst. Surg. Clausius, of the Public Health Service, reported that 8 new cases of smallpox had occurred at Grand Ronde Indian Agency, Oreg., making a total of 50 cases during the period from April 20 to May 11, 1913.

Miscellaneous State Reports.

Places.	Cases.	Deaths.
Iowa (Apr. 1-31):		
Counties—		
Adams	1	
Boone	18	
Calhoun	1	
Cass	3	
Cerro Gordo	7	
Cherokee	2	
Clarke	4	
Clay	1	
Clinton	1	
Dallas	18	
Davis	6	
Fremont	1	
Greene	5	
Grundy	1	
Guthrie	8	
Hancock	4	
Ida	1	
Jasper	8	
Johnson	25	
Jones	1	
Linn	10	
Louisa	1	
Marshall	14	
Mills	1	
Mitchell	13	
Monona	1	
Muscatine	2	
Plymouth	1	
Pocahontas	1	
Polk	51	
Pottawattamie	4	
Ringgold	30	
Sac	10	
Scott	9	
Sioux	1	
Story	2	
Webster	64	
Winnebago	1	
Winneshiek	4	
Total	336	

Places.	Cases.	Deaths.
Indiana (Apr. 1-30):		
Counties—		
Brown	6	
Carroll	4	
Clark	1	
Clay	13	
Dearborn	10	
Dekalb	7	
Dubois	2	
Floyd	26	
Fountain	7	
Gibson	18	
Grant	3	
Greene	7	
Harrison	4	
Hendricks	1	
Knox	24	
Kosciusko	2	
Lake	10	
Madison	40	
Marion	1	
Martin	1	
Miami	15	
Orange	1	
Owen	10	
Perry	19	
Pike	1	
Posey	4	
Scott	1	
Shelby	15	
Steuben	10	
St. Joseph	3	
Vanderburg	170	
Vigo	51	
Wabash	1	
Warrick	8	
White	37	
Total	533	
Kansas (Apr. 1-30):		
Counties—		
Allen	6	
Atchison	1	

Miscellaneous State Reports—Continued.

Places.	Cases.	Deaths.
Kansas (Apr. 1-30)—Contd.		
Counties—Continued.		
Anderson	3	
Chautauqua	1	
Coffey	2	
Crawford	62	
Douglass	1	
Franklin	3	
Gove	2	
Labette	10	
Marshall	4	
McPherson	18	
Montgomery	6	2
Nemaha	5	
Neosho	2	
Pratt	3	
Reno	8	
Republic	2	
Rice	4	
Sedgwick	6	
Shawnee	1	
Sheridan	3	
Sumner	45	
Kansas (Apr. 1-30)—Contd.		
Counties—Continued.		
Wilson	24	
Wyandotte	6	
Total	228	2
North Dakota (Apr. 1-30):		
Counties—		
Barnes	1	
Billings	12	
Cass	3	
Cavalier	3	
Dunn	16	
Eddy	2	
Grand Forks	1	
Kidder	4	
Lamoure	11	
McHenry	5	
Ramsey	1	
Sargent	5	
Wells	2	
Total	66	

City Reports for Week Ended May 10, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Altoona, Pa	2		Nashville, Tenn	1	
Aurora, Ill	1		New Orleans, La	1	
Baltimore, Md	2		New York, N. Y	2	
Chattanooga, Tenn	5		Niagara Falls, N. Y	3	
Chicago, Ill	4		Northampton, Mass	1	
Cincinnati, Ohio	4		Oakland, Cal	2	
Danville, Ill	3		Peoria, Ill	1	
Evansville, Ind	30		Portsmouth, Va	1	
Fitchburg, Mass	1		Roanoke, Va	2	
Kansas City, Kans	1		South Bend, Ind	1	
Knoxville, Tenn	27		Spokane, Wash	11	
Lexington, Ky	1		Springfield, Ill	3	
Los Angeles, Cal	2		Springfield, Ohio	5	
Manchester, N. H	1		Superior, Wis	2	
Milwaukee, Wis	4		Toledo, Ohio	7	
Montgomery, Ala	3		Washington, D. C	11	
Muscatine, Iowa	1		Zanesville, Ohio	8	

TYPHOID FEVER.

State Reports for April, 1913.

Places.	Number of new cases reported during month.
California:	
Alameda County—	
Hayward	1
Oakland	6
Rural	3
Colusa County—	
Williams	2
Contra Costa County—	
Antioch	1
Concord	1
Kern County—	
Bakersfield	2
Los Angeles County—	
Long Beach	1
Los Angeles	4
Rural	1
California—Continued.	
Riverside County—	
Riverside	1
Sacramento County—	
Sacramento	3
San Francisco County—	
San Francisco	12
Santa Clara County—	
Santa Clara	2
Siskiyou County—	
Weed	1
Solano County—	
Rio Vista	3
Tulare County—	
Alpaugh	2
Total	46

TYPHOID FEVER—Continued.

State Reports for April, 1913—Continued.

Places.	Number of new cases reported during month.
Indiana:	
Bartholomew County	3
Cass County	1
Clark County	15
Clinton County	2
Daviess County	2
Dearborn County	1
Floyd County	5
Gibson County	1
Hamilton County	2
Hancock County	2
Harrison County	3
Howard County	1
Huntington County	2
Jackson County	1
Jefferson County	3
Johnson County	12
Knox County	1
Kosciusko County	1
Lake County	1
Lawrence County	2
Madison County	6
Marion County	11
Morgan County	1
Orange County	1
Owen County	4
Parke County	6
Porter County	2
Putnam County	4
Shelby County	2
St. Joseph County	3
Sullivan County	1
Switzerland County	1
Tipton County	4
Warrick County	4
Washington County	3
Wayne County	2
White County	1
Total	117
Kansas:	
Marion County	1
Nemaha County	1
Pratt County	1
Republic County	6
Smith County	1
Sumner County	1
Thomas County	1
Woodson County	2
Wyandotte County—	
Kansas City	1
Total	15
Maryland, exclusive of Baltimore city:	
Allegany County—	
Allegany Hospital	4
Cumberland	30
Lonaconing	1
Luke	1
Mount Savage	1
Pekin	1
Westernport	10
Anne Arundel County—	
Churchton	1
Baltimore County—	
Arlington	1
Catonsville	1
Halethorpe	1
Highlandtown	1
Rodgers Forge	1
Roland Park	1
Towson	1
Carroll County—	
Cranbery	1
Littlestown	1
Springfield Hospital	1
Maryland, exclusive of Baltimore city—Continued.	
Charles County—	
Rock Point	2
Dorchester County—	
Bishops Head	1
Cambridge	1
Lakesville	1
Woolford	1
Frederick County—	
Jefferson	1
Garrett County—	
Bloomington	6
Harford County—	
Mountain	1
Howard County—	
Ellicott City	2
Kent County—	
Betterton	1
Montgomery County—	
Dickerson	1
Germantown	1
Prince Georges County—	
Capitol Heights	1
Laurel	1
Queen Annes County—	
Centerville	1
Somerset County—	
Crisfield	1
Washington County—	
Funkstown	1
Gapland	1
Hagerstown	2
Hancock	1
Trego	1
Wicomico County—	
Pittsville	2
Worcester County—	
Berlin	1
Ironshire	1
Showell	1
Total	93
New Jersey:	
Atlantic County—	
Hamilton Township	1
Bergen County—	
Englewood	1
Burlington County—	
Burlington	1
Palmyra Township	1
Camden County—	
Camden	6
Center Township	1
Merchantville	1
Cape May County—	
Ocean City	1
Cumberland County—	
Fairfield Township	1
Essex County—	
East Orange	2
Irvington	1
Montclair	1
Orange	2
South Orange Township	1
Gloucester County—	
Monroe Township	1
Hudson County—	
Bayonne	1
Harrison Township	1
Hoboken	1
Jersey City	3
Kearny	1
North Bergen Township	1
Weehawken Township	1
Hunterdon County—	
East Amwell Township	1
Lambertville	2

TYPHOID FEVER—Continued.

State Reports for April, 1913—Continued.

Places.	Number of new cases reported during month.
New Jersey—Continued.	
Mercer County—	
Hamilton Township	3
Princeton	1
Trenton	4
Middlesex County—	
Perth Amboy	1
Roosevelt	3
South Amboy	1
Woodbridge Township	2
Monmouth County—	
Keyport	6
Ocean County—	
Doyer Township	1
Passaic County—	
Passaic	2
Paterson	2
Sussex County—	
Newton Township	1
Union County—	
Elizabeth	1
Roselle	1
Summit	1
Warren County—	
Alpha	2
Total	66
New York:	
Albany County	3
Albany	156
Watervliet	7
Allegany County	1
Broome County	2
Binghamton	7
Olean	1
Cayuga County	1
Auburn	1
Chautauqua County	1
Dunkirk	5
Jamestown	1
Chemung County—	
Elmira	1
Chenango County	1
Clinton County	2
Columbia County	2
Cortland County—	
Cortland	1
Erie County—	
Buffalo	18
Tonawanda	3
Essex County	4
Franklin County	3
Genesee County	1
Greene County	7
Hermiker County	1
Little Falls	1
Jefferson County	1
Watertown	2
Madison County—	
Oneida	2
Monroe County—	
Rochester	6
Nassau County	1
Niagara County	2
Lockport	15
North Tonawanda	12
Oneida County	3
Rome	1
Onondaga County	1
Syracuse	1
Ontario County	2
Newburgh	1
Orange County—	
Middletown	1
Orleans County	1
New York—Continued.	
Oswego County	1
Fulton	1
Oswego	2
Otsego County	2
Rensselaer County	1
Rensselaer	2
St. Lawrence County	4
Saratoga County	2
Schenectady County—	
Schenectady	5
Schoharie County	1
Seneca County	2
Steuben County	2
Corning	5
Hornell	1
Ulster County	1
Kingston	2
Washington County	6
Wayne County	1
Westchester County	2
New Rochelle	1
Yonkers	1
Wyoming County	1
Yates County	2
Greater New York	67
Total	398
North Dakota:	
Barnes County	1
Dickey County	6
Lamoure County	3
McHenry County	5
Sargent County	1
Wells County	1
Total	17
Washington:	
Chehalis County	1
Chelan County	1
Challam County	1
Ferry County	1
King County—	
Seattle	6
Lewis County	4
Okanogan County	1
Pierce County—	
Spokane	1
Snohomish County—	
Everett	1
Whatcom County—	
Bellingham	2
Yakima County	1
Total	20
Wisconsin:	
Bayfield County	1
Columbia County	1
Dane County	1
Fond du Lac County	2
Jefferson County	1
Kenosha County	12
La Crosse County	2
Lafayette County	1
Manitowoc County	3
Marathon County	8
Milwaukee County	26
Portage County	2
Rusk County	2
Walworth County	1
Washington County	1
Winnebago County	1
Total	65

CEREBROSPINAL MENINGITIS.

State Reports for April, 1913.

Places.	Number of new cases reported during month.
California:	
Alameda County—	
Oakland	3
Placer County—	
Roseville	1
Sacramento County—	
Sacramento	4
Total	8
Indiana:	
Brown County	1
Clinton County	1
Fulton County	1
Harrison County	1
Laporte County	1
Miami County	1
Ripley County	2
St. Joseph County	1
Vanderburg County	2
Total	11
Iowa:	
Linn County	5
Pottawattamie County	2
Wapello County	1
Total	8
Kansas:	
Linn County	1
Sedgwick County—	
Wichita	1
Kansas—Continued.	
Shawnee County—	
Topeka	1
Thomas County	1
Wabaunsee County	1
Wyandotte County—	
Kansas City	2
Total	7
New York:	
Erie County	1
Buffalo	3
Nassau County	1
Onondaga County—	
Syracuse	1
Westchester County	1
Mount Vernon	1
Greater New York	17
Total	25
Washington:	
Skagit County	1
Wisconsin:	
Buffalo	2
Dodge	1
Forest	1
Milwaukee	5
Rock	2
Sheboygan	1
Winnebago	1
Total	13

California—Los Angeles.

Senior Surg. Brooks of the Public Health Service reported by telegraph that during the week ended May 24, 1913, 3 cases of cerebrospinal meningitis had been notified in Los Angeles, Cal.

Illinois—Cairo.

Senior Surg. Gassaway of the Public Health Service reported that during the week ended May 17, 1913, 2 cases of cerebrospinal meningitis had been notified in Cairo, Ill.

Cases and Deaths Reported by Cities for Week Ended May 10, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Cambridge, Mass	1	.....	Nashville, Tenn	1	.....
Chicago, Ill	3	2	New Orleans, La	3	.....
Cincinnati, Ohio	2	5	New York, N. Y	6	4
Cleveland, Ohio	2	4	St. Louis, Mo	1	2
Haverhill, Mass	2	1	Spokane, Wash	1	1
Kansas City, Kans	1	.....	Springfield, Mass	1	1
Los Angeles, Cal	1	1	Trenton, N. J	3	3

POLIOMYELITIS (INFANTILE PARALYSIS).

State Reports for April, 1913.

Places.	Number of new cases reported during month.
California:	
Kern County—	
Bakersfield	1
Kings County—	
Hanford	1
Los Angeles County—	
Los Angeles	1
Monterey County—	
Monterey	1
Placer County—	
Loomis	1
San Francisco County—	
San Francisco	1
Total	6
Indiana:	
Daviess County	1
Kansas:	
Greenwood County	1
New York:	
Greene County	1
Orange County	1
Westchester County	1
Greater New York	7
Total	10
Washington:	
Lincoln County	1
Wisconsin:	
Winnebago County	1

Cases and Deaths Reported by Cities for Week Ended May 10, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Boston, Mass	1	1	Newark, N. J	1	.....
Cleveland, Ohio	1	.....	New York, N. Y	1	.....
Los Angeles, Cal	1	.....	Yonkers, N. Y	1	.....

ERYSIPELAS.

Cases and Deaths Reported by Cities for Week Ended May 10, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Boston, Mass	.....	3	Milwaukee, Wis	3	1
Bridgeport, Conn	1	.....	Montclair, N. J	1	.....
Buffalo, N. Y	5	1	New York, N. Y	.....	7
Chicago, Ill	14	2	Pittsburgh, Pa	12	.....
Cincinnati, Ohio	8	3	St. Louis, Mo	13	2
Cleveland, Ohio	5	1	San Francisco, Cal	4	3
Dayton, Ohio	.....	1	Wilkinsburg, Pa	1	.....
Erie, Pa	2	.....	Williamsport, Pa	1	.....
Lexington, Ky	.....	1	Yonkers, N. Y	1	.....

LEPROSY.

Rhode Island—Narragansett Pier.

The State Board of Health of Rhode Island reported that a case of leprosy had been notified at Narragansett Pier, R. I., May 1, 1913; that the case was in a male 32 years of age who had lived in Rhode Island 21 years, previous to which period he had lived in the island of Penang; that the first symptoms of the disease had been noticed at about the age of 19 years; that the patient had been confined to his home premises during the last 5 years, and that when arrangements were being made to isolate the case on a farm he and his mother disappeared and their address was unknown on the date of the report, May 22, 1913.

PELLAGRA.

California—Los Angeles.

Senior Surg. Brooks, of the Public Health Service, reported by telegraph that during the week ended May 24, 1913, 1 case of pellagra had been notified in Los Angeles, Cal.

PLAGUE.

Rats Collected and Examined.

Places	Week ended—	Found dead.	Total collected.	Examined.	Found infected.
California:					
Cities—					
Berkeley	May 10, 1913	3	206	125	.....
Oakland	.....do.....	25	594	369	.....
San Francisco	.....do.....	22	1,842	1,297	.....
Washington:					
City—					
Seattle	.....do.....	.....	873	814	.....

California—Plague-Infected Squirrels Found.

Plague-infected ground squirrels have been found in Contra Costa County as follows: April 29, 1 squirrel; April 30, 2 squirrels; May 1, 2 squirrels. Of these squirrels, 3 were found in one locality.

PNEUMONIA.

Cases and Deaths Reported by Cities for Week Ended May 10, 1913.

Places.	Cases.	Deaths.	Places.	Cases.	Deaths.
Binghampton, N. Y	1	1	Los Angeles, Cal	2	12
Braddock, Pa	7	.....	Newport, Ky	1	1
Chicago, Ill	15	125	Pittsburgh, Pa	53	66
Cleveland, Ohio	30	11	San Diego, Cal	1	1
Dunkirk, N. Y	1	1	San Francisco, Cal	10	.....
Erie, Pa	1	.....	Saratoga Springs, N. Y	1	2
Galesburg, Ill	2	2	Schenectady, N. Y	1	1
Grand Rapids, Mich	3	1	South Bethlehem, Pa	1	.....
Homestead, Pa	1	3	South Omaha, Nebr	2	.....
Kalamazoo, Mich	5	2	Williamsport, N. C	1	.....
Lancaster, Pa	2	.....	Woburn, Mass	1	.....

TETANUS.

Cases and Deaths Reported by Cities for Week Ended May 10, 1913.

Places.	Cases.	Deaths.
Chicago, Ill	1	2
New Orleans, La	.....	1
New York, N. Y	.....	1
St. Louis, Mo	1	.....
San Diego, Cal	1	1

SCARLET FEVER, MEASLES, DIPHTHERIA, AND TUBERCULOSIS.

State Reports for April, 1913.

	Scarlet fever.	Measles.	Diphtheria.
California	104	315	107
Indiana	578	3,699	147
Iowa	122	.....	109
Kansas	124	1,960	39
Maryland, exclusive of Baltimore city	29	1,194	42
New Jersey	568	.....	450
New York	697	5,182	402
North Dakota	49	305	25
Washington	99	1,235	79
Wisconsin	393	1,133	192

Los Angeles, Cal.—Measles.

Senior Surg. Brooks, of the Public Health Service, reported by telegraph that during the week ended May 24, 1913, 445 cases of measles had been notified in Los Angeles, Cal.

Pittsburgh, Pa.—Measles.

Surg. Stoner, of the Public Health Service, reported by telegraph that during the week ended May 24, 1913, 130 cases of measles, with 7 deaths, had been notified in Pittsburgh, Pa., making a total of 9,133 cases, with 153 deaths, since the beginning of the outbreak, November 1, 1912. During the week ended May 17, 6 deaths were notified, instead of 7 deaths previously reported.

Cairo, Ill.—Diphtheria.

Senior Surg. Gassaway, of the Public Health Service, reported that during the week ended May 17, 1913, 1 case of diphtheria had been notified in Cairo, Ill.

St. Michaels, Alaska—Diphtheria.

Passed Asst. Surg. Krulish, of the Public Health Service, reported that during the week ended May 10, 1913, 2 cases of diphtheria had been notified at St. Michaels, Alaska.

Cases and Deaths Reported by Cities for Week Ended May 10, 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	224	15	.....	303	7	13	.....	24	18
Boston, Mass	670,585	260	33	4	168	1	38	3	49	28
Chicago, Ill	2,185,283	680	167	15	481	12	228	22	128	81
Cleveland, Ohio	560,663	184	34	3	206	3	23	2	29	18
New York, N. Y	4,766,883	1,543	328	24	1,533	29	300	13	525	184
Pittsburgh, Pa	533,905	205	16	3	170	.....	39	3	42	15
St. Louis, Mo	687,029	209	36	3	144	3	35	2	61	21

Cases and Deaths Reported by Cities for Week Ended May 10, 1913—Contd.

Cities.	Population United States census, 1910.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
From 300,000 to 500,000 inhabitants:										
Buffalo, N. Y.	423,715	129	6	.....	123	3	9	1	.....	.....
Cincinnati, Ohio	364,463	.....	19	1	16	.....	13	.....	35	16
Los Angeles, Cal.	319,198	131	7	1	517	.....	3	.....	32	22
Milwaukee, Wis.	373,857	103	15	1	46	.....	31	4	31	12
Newark, N. J.	347,469	95	34	.....	75	.....	30	.....	47	.....
New Orleans, La.	339,075	137	18	.....	197	3	3	.....	16	13
San Francisco, Cal.	416,912	140	4	.....	29	.....	14	2	20	15
Washington, D. C.	331,069	107	9	.....	803	2	15	1	16	16
From 200,000 to 300,000 inhabitants:										
Jersey City, N. J.	267,779	83	.....	5	.....	1	.....	1	.....	12
Providence, R. I.	224,326	51	18	4	6	1	22	.....	2	4
From 100,000 to 200,000 inhabitants:										
Bridgeport, Conn.	102,054	21	4	.....	2	.....	15	.....	6	2
Cambridge, Mass.	104,839	23	2	.....	49	.....	.....	.....	5	.....
Dayton, Ohio	116,577	38	3	.....	2	.....	3	.....	.....	4
Fall River, Mass.	119,295	50	1	.....	64	1	19	.....	9	4
Grand Rapids, Mich.	112,571	30	5	1	32	.....	6	.....	.....	2
Lowell, Mass.	106,294	33	3	1	29	.....	4	.....	2	6
Nashville, Tenn.	110,364	44	.....	.....	12	1	.....	.....	5	5
Oakland, Cal.	150,174	38	3	1	.....	.....	.....	.....	2	1
Richmond, Va.	127,628	44	.....	.....	26	1	4	.....	1	3
Spokane, Wash.	104,402	.....	1	.....	11	.....	6	.....	1	2
Toledo, Ohio	168,497	51	8	1	97	1	4	.....	.....	5
Worcester, Mass.	145,986	52	7	.....	44	.....	11	.....	7	4
From 50,000 to 100,000 inhabitants:										
Altoona, Pa.	52,127	16	4	.....	1	.....	1	.....	1	2
Bayonne, N. J.	55,545	9	4	.....	3	.....	4	1	3	.....
Brockton, Mass.	56,878	8	3	.....	4	.....	.....	.....	3	.....
Camden, N. J.	94,538	.....	9	.....	19	.....	5	.....	11	.....
Elizabeth, N. J.	73,409	19	1	.....	14	.....	3	.....	6	2
Erie, Pa.	66,525	24	2	.....	60	.....	5	.....	4	.....
Evansville, Ind.	69,647	20	1	.....	10	.....	9	.....	.....	5
Fort Wayne, Ind.	63,933	20	.....	.....	100	.....	2	.....	.....	2
Harrisburg, Pa.	64,186	17	.....	.....	15	.....	.....	.....	8	1
Hartford, Conn.	98,915	32	10	1	13	2	7	.....	2	1
Hoboken, N. J.	70,324	49	12	1	24	1	5	.....	6	.....
Johnstown, Pa.	55,482	.....	9	1	59	.....	1	.....	.....	.....
Kansas City, Kans.	82,331	.....	2	.....	25	.....	6	.....	2	.....
Lawrence, Mass.	85,892	.....	.....	.....	12	1	.....	.....	3	1
Lynn, Mass.	89,336	35	1	.....	66	.....	2	1	1	6
Manchester, N. H.	70,063	18	1	.....	13	.....	.....	.....	2	2
New Bedford, Mass.	96,652	36	3	1	70	1	7	.....	7	4
Passaic, N. J.	54,773	14	4	.....	5	.....	.....	.....	7	3
Pawtucket, R. I.	51,622	6	.....	1	.....	.....	.....	.....	.....	1
Peoria, Ill.	66,950	15	.....	.....	.....	.....	7	1	.....	1
Reading, Pa.	96,071	36	5	.....	20	.....	8	.....	1	2
Saginaw, Mich.	50,510	20	1	.....	9	.....	7	.....	6	2
St. Joseph, Mo.	77,403	23	.....	.....	175	.....	6	.....	3	2
Schenectady, N. Y.	72,826	19	.....	.....	19	1	14	4	2	.....
South Bend, Ind.	53,684	10	2	.....	8	.....	3	.....	.....	.....
Springfield, Ill.	51,678	12	3	.....	7	1	1	.....	.....	1
Springfield, Mass.	88,926	30	7	.....	21	.....	.....	.....	.....	1
Trenton, N. J.	96,815	39	1	.....	6	.....	8	2	7	5
Wilkes-Barre, Pa.	67,105	32	3	.....	8	.....	.....	.....	4	2
Wilmington, Del.	87,411	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yonkers, N. Y.	79,803	32	3	.....	24	.....	6	.....	9	3
From 25,000 to 50,000 inhabitants:										
Atlantic City, N. J.	46,150	17	1	1	80	1	4	.....	.....	.....
Aurora, Ill.	29,807	9	3	.....	.....	.....	1	.....	.....	.....
Berkeley, Cal.	40,434	4	.....	.....	.....	.....	5	.....	1	.....
Binghamton, N. Y.	48,443	21	3	.....	.....	.....	.....	.....	1	1
Brookline, Mass.	27,792	6	2	.....	15	.....	1	.....	.....	.....
Chattanooga, Tenn.	44,604	.....	1	.....	.....	.....	.....	.....	1	.....
Chelsea, Mass.	32,452	16	1	.....	11	.....	2	.....	1	3
Chicopee, Mass.	25,401	4	3	1	1	.....	2	.....	.....	.....
Danville, Ill.	27,871	8	.....	.....	16	.....	.....	.....	.....	2
East Orange, N. J.	34,371	.....	1	.....	18	.....	.....	.....	.....	.....
Elmira, N. Y.	37,176	8	.....	.....	8	.....	.....	.....	.....	1
Everett, Mass.	33,484	4	.....	.....	11	.....	2	.....	3	.....

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

Cases and Deaths Reported by Cities for Week Ended May 10, 1913—Contd.

Cities.	Population United States census, 1910.	Total deaths from all causes.	Diphtheria.		Measles.		Scarlet fever.		Tuberculosis.	
			Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
From 25,000 to 50,000 inhabitants—Continued.										
Fitchburg, Mass	37,826	8	1		21		1		5	1
Haverhill, Mass	44,115	10	1		9	1	1		4	
Kalamazoo, Mich	39,437	22			2		1		1	2
Knoxville, Tenn	36,346	13			15					3
La Crosse, Wis	30,417		3	1						1
Lancaster, Pa	47,227		3		25		3		3	
Lexington, Ky	35,099	16	1		10				9	2
Lima, Ohio	30,508	8			21		1	1		2
Lynchburg, Va	29,494	8			18				2	2
Malden, Mass	44,404	8			40		1		3	
Montgomery, Ala	38,136	17							2	4
New Castle, Pa	36,280		5		25		1		1	
Newport, Ky	30,309	11							2	2
Newton, Mass	39,806	11			18		2			
Niagara Falls, N. Y	30,445	12			6		5	2		
Norristown, Pa	27,875	8	1				2			
Orange, N. J	29,630	11	3		12				7	1
Pasadena, Cal	30,291	8			11		1			1
Pittsfield, Mass	32,121	13			32		3			1
Portsmouth, Va	33,190	9			19					
Racine, Wis	38,002	15	2		22		1			
Roanoke, Va	34,874	8			35				4	1
Rockford, Ill	45,401	12	1				3			
Salem, Mass	43,697	8			2		1			
San Diego, Cal	39,578	5	1		3				3	3
South Omaha, Nebr	26,259	6								
Springfield, Ohio	46,921				9		1			
Superior, Wis	40,384	11					3			2
Taunton, Mass	34,259	9	1		4				5	1
Waltham, Mass	27,834	7			6				2	
West Hoboken, N. J	35,403				5		1		4	
Wheeling, W. Va	41,641	15	3		9		1			
Williamsport, Pa	31,860	9	1		5					
Wilmington, N. C	25,748	9			8				3	2
York, Pa	44,750		2		3		2		3	
Zanesville, Ohio	28,026	11	2		2			1		
Less than 25,000 inhabitants:										
Ann Arbor, Mich	14,817	7			18		1		6	
Beaver Falls, Pa	12,191	1	1		5					
Biddeford, Me	17,079	6	1							
Braddock, Pa	17,759		1		2		2			
Cambridge, Ohio	17,327				12		1			
Clinton, Mass	13,075	1								
Columbus, Ind	6,719	1			7					
Concord, N. H	21,477	9			28					
Cumberland, Md	21,839	8	1		12				2	1
Dunkirk, N. Y	11,616	4			8					
Franklin, N. H	6,132	4			11					
Galesburg, Ill	22,089	11			2				2	2
Homestead, Pa	18,713	10	1		4		1			
Kearney, N. J	18,659	7	3		4				3	
Lafayette, Ind	20,081	7			1					1
Marinette, Wis	14,610	2								1
Marlboro, Mass	13,606	3	1		27				2	1
Massillon, Ohio	23,830	1	1		1		1			
Medford, Mass	23,150	4	3		6		5		1	
Melrose, Mass	15,715	6	1		4				1	1
Moline, Ill	24,190	11								
Montclair, N. J	21,450	9			11				2	
Morristown, N. J	12,507	4	1							
Muscatine, Iowa	16,000	3			19					
Nanticoke, Pa	18,857	2			2		6		1	
Newburyport, Mass	19,240	6	1		14				5	1
North Adams, Mass	22,019	7								1
Northampton, Mass	23,310	6					1		3	
Plainfield, N. J	23,550	4	1					1	2	
Saratoga Springs, N. Y	13,534	7			11					1
South Bethlehem, Pa	13,241	8	2	1	6		3		1	
Steelton, Pa	14,479	2			2					
Wilkinsburg, Pa	18,594	5			1		2		1	
Woburn, Mass	14,254	4								

IN INSULAR POSSESSIONS.

HAWAII.

Examination of Rodents.

Rats and mongooses were examined as follows: Honolulu, May 3, 1913, 446; Hilo, week ended April 26, 1913, 1,133; Honokaa, 1,784. No plague-infected rodent was found.

PORTO RICO.

Rodents Collected and Examined.

Passed Asst. Surg. Creel reports that during the week ended May 10, 1913, there were examined 1,617 rodents, collected from various points in Porto Rico, and that of these 501 were collected from various parts of San Juan municipality. None was found infected with plague.

FOREIGN REPORTS.

CHINA.

Amoy—Plague.

Acting Asst. Surg. Bonthius reported April 19: Plague is increasing in Amoy. In the international settlement of Kulangsu cases of plague are present and one death from the disease was notified during the week ended April 12, 1913.

On May 26 Dr. Bonthius reported by telegraph that plague was epidemic at Amoy.

Hongkong—Plague—Plague-Infected Rats.

Surg. Brown reports: During the week ended April 7 there were notified at Hongkong 8 cases of plague with 7 deaths.

During the same week 2,158 rats were examined for plague infection. Two plague-infected rats were found.

The American consul general at Hongkong reported May 26 the occurrence of 24 cases of plague.

CUBA.

Habana—Transmissible Diseases.

MAY 1-10, 1913.

Diseases.	New cases.	Deaths.	Remaining under treatment.	Diseases.	New cases.	Deaths.	Remaining under treatment.
Leprosy	1	1	244	Measles	82	3	65
Typhoid fever	15	4	33	Varicella	35	.....	10
Diphtheria	20	1	19	Paratyphoid fever	2	1	12
Scarlet fever	41	1	48				

GERMAN EAST AFRICA.

Muanza—Plague-Infected Rats.

Plague-infected rats were reported found in Ostusmao, district of Muanza, about March 15, 1913.

FRANCE.

Havre—Typhoid Fever Outbreak Spread by Milk.

By JOHN BALL OSBORNE, American consul at Havre.

An epidemic of typhoid fever, which the local health authorities have traced unmistakably to contamination of the milk supply, is now prevailing in Havre (population 136,159). The progress of this

disease since the beginning of the year is shown in the following statistics:

	Cases notified.	Deaths registered.
January	3	.....
February	13	1
March	14	2
April	29	4
May (1 to 9)	15	1

During the week ended May 3, 1913, there were 24 new cases and 2 deaths reported from this cause. At this writing (May 10, 1913) there are about 50 cases remaining under treatment. In the year 1912 there were 33 deaths out of 204 cases declared.

This epidemic, while as yet by no means extensive, and not especially virulent, furnishes convincing and impressive proof of the danger of contaminated milk as an active agency in the spread of typhoid fever. Of the 29 cases declared in the month of April, no less than 13, or 45 per cent, have been traced clearly to milk supplied by one dairyman, on whose premises there was a single case of typhoid in the working force.

The milk from this farm was held in high repute, being delivered in sealed bottles and guaranteed for purity. The daily output of the farm is about 600 quarts, delivered mostly in the city of Havre, particularly among the pharmacies, where pure milk is in demand. The consequence is that most of the victims belong to families in comfortable circumstances of life. By reason of the wide distribution of the polluted milk, there are now numerous centers of infection. Among the victims are included several persons engaged in the retail trade in food commodities, which fact naturally causes uneasiness among the customers. There are four families in each of which there are three cases and two families with two cases each.

Although the dairy farm that has caused the trouble is located outside the city of Havre, the bureau of hygiene, with the authority of the sous-prefet, took possession of it as soon as it learned the situation. A health inspector who is a chemist was placed in charge, and proper measures were taken to correct the defective conditions. It is believed that this energetic action has arrested the extension of the epidemic. Recently the health authorities caused a notice to be inserted in all the newspapers of the city urging the inhabitants to boil the milk of every origin.

At no time has the water supply of Havre been suspected by the health authorities as the cause of the present epidemic, since repeated analysis has demonstrated its freedom from typhoid bacilli. The practice, however, of fertilizing garden truck farms in the vicinity

of Havre with the contents of the cesspools of the city has given more uneasiness than the water supply. A modern sewerage system was begun here a few years ago, but entire blocks in the central portion of the city remain unconnected. Each year the premises on certain designated streets are required to be connected with the system. During April, 1913, 50 premises were thus connected. A few years hence the entire city will have a satisfactory system.

Within the last three months antityphoid vaccine has been used for the first time in Havre. A physician of the bureau of hygiene has inoculated 78 persons, of whom 28 were connected with the dairy farm above referred to. So far only men have received the treatment and no case of typhoid fever has developed among them.

GREECE.

Patras—Smallpox Epidemic.

Smallpox was reported to be epidemic at Patras April 28, the number of cases present in the city being estimated at about 100.

JAPAN.

Recurrent Fever.

Recurrent fever was reported present in Tokyo and Yokohama April 29, 1913. At Tokyo the disease appeared April 19 and to April 29 a total of 13 cases had been notified. At Yokohama two cases have been reported.

JAVA.

Plague.

Consul Rairden at Batavia reports: During the month of March, 1913, plague was reported in east Java as follows:

Districts.	Cases.	Deaths.
Kediri	123	114
Madioen	41	38
Malang	363	353
Surabaya	15	15

MEXICO.

Vera Cruz—Smallpox.

During the week ended April 13 there were notified at Vera Cruz 25 new cases of smallpox with 4 deaths.

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX.

Reports Received During Week Ended May 30, 1913.

CHOLERA.

Places.	Date.	Cases.	Deaths.	Remarks.
Dutch East Indies:				
Java—				
Batavia	Mar. 16-29	28	19	And Tanjong Priok, the harbor.
Madioen	Jan. 31-Feb. 22	15	10	
Samarang	Feb. 21-27	3	4	
India:				
Bassein	Mar. 31-Apr. 5	10	9	
Bombay	Apr. 13-19	2	2	
Straits Settlements:				
Singapore	Apr. 6-12	1		

PLAGUE.

Arabia:				
Aden	Apr. 29-May 6	10	6	
Argentina:				
Herrera [1]	Feb. 22	9	6	Southeastern part of Entre Rios.
British East Africa	Feb. 27-Mar. 31		9	
Khambu	do	1		
Kisumu	do	2		
Nairobi	do	9		
China:				
Amoy	Apr. 6-12		1	May 26 epidemic.
Kulangsu	do			Increasing.
Hongkong	Apr. 13-19	3	3	May 26: Cases, 24.
Dutch East Indies:				
Java				Mar. 1-31: Cases, 542; deaths, 520.
Districts—				
Kediri	Mar. 1-31	123	114	
Madioen	do	41	38	
Malang	do	363	353	
Surabaya	do	15	15	
India:				
Bombay	Apr. 13-19	268	240	
Provinces—				
Delhi	Mar. 2-Apr. 5	106	79	Total, Mar. 2-Apr. 5: Cases, 60,087; deaths, 51,474.
Bombay	do	2,373	1,777	
Madras	do	525	439	
Bengal	do	302	284	
Bihar and Orissa	do	10,706	9,069	
United Provinces	do	38,763	33,935	
Punjab	do	4,756	3,790	
Burma	do	787	707	
Central Provinces	do	340	247	
Mysore	do	396	307	
Hyderabad	do	213	174	
Central India	do	40	31	
Rajputana	do	725	604	
Kashmir	do	55	31	
Indo-China:				
Saigon	Mar. 25-Apr. 7	10	6	
Mauritius	Feb. 7-20	24	11	

SMALLPOX.

Austria-Hungary:				
Galicia	Apr. 20-26	2		
Canada:				
Quebec—				
Grosse Isle Quarantine				May 15, 1 case on S. S. Canada from Trieste, via Patras, Naples, and Lisbon.
Sault de St. Marie	May 4-10	1		
St. Johns	do	1		
Toronto	May 11-17	2		
Vancouver	Apr. 19-25	1		
Victoria	May 4-10	2		
China:				
Amoy	Apr. 6-12		1	
Hongkong	Apr. 13-19	3	2	
Shanghai	Apr. 14-27	1	12	Deaths among natives.
Tientsin	Apr. 13-19		2	

[1] From the Veröffentlichungen des Kaiserlichen Gesundheitsamtes, Apr. 23, 1913.

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

Reports Received During Week Ended May 30, 1913—Continued.

SMALLPOX—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
France:				
Paris	Apr. 20-May 3	6		
Germany	Apr. 27-May 3	7		
Great Britain:				
London	Apr. 27-May 3	1		
Greece:				
Piræus	Jan. 1-Mar. 13	119	49	Including previous report.
India:				
Bombay	Apr. 13-19	31	15	
Madras	do	4	1	
Moulmine	Feb. 23-Mar. 1	1		
Japan:				
Nagasaki	Apr. 21-27		1	
Mexico:				
Aguascalientes	May 5-11		5	
Cananea	May 22			Many fatal cases.
Guadalajara	Apr. 26-May 3	3		
Hermosillo	May 4-10	7		
Nogales	May 23	3		
Salina Cruz	Apr. 20-May 3	2	1	
Newfoundland:				
St. Johns	May 4-17	6		
Spain:				
Barcelona	May 4-10		7	
Madrid	Apr. 1-30		23	
Valencia	Apr. 27-May 10	9		
Sweden:				
Stockholm	Apr. 13-26	27		
Switzerland:				
Cantons—				
Luzerne	Apr. 13-19	1		
St. Gaul	Apr. 16-22		1	
Turkey in Asia:				
Adana	Apr. 26			Present.
Beirut	Apr. 13-26	5		
Mersina	Apr. 20-May 3	15	24	
Tarsus	Apr. 20-26			Do.
Turkey in Europe:				
Constantinople	Apr. 26-May 3		14	
Saloniki	Apr. 21-May 4	4	7	

Reports Received from Dec. 27, 1912, to May 23, 1913.

CHOLERA.

Bulgaria:				
Eski Saghara	Dec. 9	2		
Sofia	Nov. 21-Dec. 16	6	1	
Shumla	Dec. 30	18		
China:				
Foochow	Nov. 20-Dec. 2			Isolated cases.
Hongkong	Mar. 23-29	5	5	Among Chinese.
Shanghai				Total 1912: Cases, 10, in the foreign settlement.
Dutch East Indies:				
Borneo—				
Bandermasin	Nov. 22-30	5	5	
Pontrank	Oct. 6	1		
Samarinda	Oct. 9-Nov. 2	26	25	
Singkawang	Oct. 8-Nov. 1	2	2	
Celebes—				
Batangmata	Mar. 8-14			Present.
Java—				
Batavia	Nov. 9-Dec. 31	40	28	
Do	Jan. 19-Mar. 15	117	92	Mar. 31-Apr. 5, 11 fatal cases.
Madioen	Sept. 15-Nov. 9	192	105	
Megalang	Oct. 7-12	9	6	
Pasoeroean Residency	Sept. 20-26	2	1	
Samarang	July 19-Dec. 26	591	485	
Do	Dec. 27-Jan. 30	7	7	
Surabaya	Oct. 16-Nov. 28	4	3	
Sumatra—				
Air Tiris	Dec. 3-22	11	11	
Benkoelen	Nov. 3-30	3	1	
Koeoh	Dec. 3-15	4	9	
Jambi	Sept. 18-24	1		
Roembo	Dec. 3-15	2	2	
Telokbetong	Nov. 1-Dec. 31	181	20	

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

Reports Received from Dec. 27, 1912, to May 23, 1913—Continued.

CHOLERA—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
India:				
Bassein	Jan. 25-Mar. 29	112	99	
Bombay	Nov. 17-Apr. 5	218	154	
Calcutta	Nov. 9-Mar. 8		573	
Cochin	Oct. 10-Nov. 9	6	6	
Do	Feb. 17-23	5	5	
Madras	Nov. 24-Apr. 5	38	37	
Moulmine	Feb. 23-Mar. 29	5	5	
Negapatam	Nov. 11-Mar. 8	34	34	
Rangoon	Nov. 1-Dec. 28	3	3	
Do	Dec. 29-Mar. 1	30	28	
Indo-China: Saigon	Aug. 20-Oct. 27	42	38	
Japan				Total year 1912: Cases, 2,722; deaths, 1,678, exclusive of Taiwan. Epidemic, Aug. 1, 1912-Mar. 3, 1913: Cases, 2,634; deaths, 1,696, including cases p. 2233, Vol. XXVII, and p. 859, Vol. XXVIII.
Prefectures—				
Akita	Dec. 2	1	1	
Chiba	Nov. 21-Mar. 3	116	83	
Ehime	Sept. 21-Dec. 2	52	21	
Fukuoka	Aug. 1-Dec. 2	816	531	
Fukushima	Dec. 5	1		
Hiogo	Sept. 27-Nov. 24	137	100	
Hiroshima	Sept. 21-Nov. 23	49	32	
Ibariki	Dec. 6	2	2	
Iwate	Dec. 16	2	1	
Kagawa	Oct. 12-Nov. 21	15	10	
Kagoshima	Sept. 21-Oct. 18	11	5	
Kanagawa	Sept. 25-Feb. 4	122	94	Including Yokohama.
Yokohama	Sept. 29-Jan. 9	39		Sept. 25-Dec. 7: 9 cases from vessels.
Kochi	Oct. 19-Dec. 4	25	14	
Kioto	Sept. 21-Nov. 1	5	5	
Kumamoto	do	15	9	
Minami Tokaki gun	Sept. 15-Dec. 2			40 cases not included in total.
Nagasaki	do	188	112	Including Nagasaki city, and with outlying islands, 134 deaths.
Oita	Sept. 21-Dec. 5	38	21	
Okayama	Sept. 21-Nov. 22	67	39	
Osaka	Sept. 21-Mar. 3	165	108	
Saga	Sept. 21-Dec. 3	109	76	
Saitama	Oct. 12-18	3	2	
Shidzuoka	Oct. 19-Mar. 3	90	33	
Shimane	To Mar. 3	2		
Taiwan (Formosa)				Total year 1912: Cases, 333; deaths, 256.
Tokyo	Sept. 23-Feb. 4	314	217	
Tokushima	Sept. 15-Dec. 1	8	5	
Wakamatsu	Nov. 26			1 case not included in total.
Wakayama	Oct. 19-Nov. 16	13	12	
Yamaguchi	Sept. 21-Nov. 26	267	162	
Yamanchi	Feb. 3	1	1	
Russia:				
Odessa	Jan. 8-21	5	2	Nov. 18-20: 1 case from s. s. Bosnian from Constantinople. Confined in the quarantine barracks.
Servia:				
Pirot	Apr. 10	5		Among returning soldiers and prisoners.
Siam:				
Bangkok	Oct. 13-Mar. 22		8	
Straits Settlements:				
Singapore	Nov. 17-23	2	2	
Do	Jan. 27-Apr. 5	5	2	
Turkey in Asia				Total, Nov. 17-23: Cases, 160; deaths, 218.
Adana—				
Adana	Nov. 17-Dec. 2	2	2	
Aleppo—				
Aleppo	Nov. 24-Dec. 2	3	3	
Alexandretta	do	3	2	
Angora—				
Angora	Nov. 24-Dec. 11	29	23	

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

Reports Received from Dec. 27, 1912, to May 23, 1913—Continued.

CHOLERA—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Turkey in Asia—Continued.				
Balikesir	Nov. 24-Dec. 2		1	
Beirut—				
Merdijioun	Dec. 3-11		15	
Tavariyeh	Dec. 13-22			Present.
Brusa	Nov. 17-Dec. 11	26	38	
Castamoni	Nov. 17-Dec. 2	6	4	
Dierbekir	do	8	2	
Hedjaz—				
Jedda	Nov. 25-Dec. 14	395	393	Among returning pilgrims.
Medina	Dec. 3-11		6	
Mekka	Nov. 17-23	111	172	Dec. 3-11: Deaths, 3,007.
Ismidt	Nov. 17-Dec. 2	3	1	
Kartal	Dec. 30-Feb. 12	9	3	
Khodavendikar—				
Karassi	Jan. 30-Feb. 12		2	
Mosul	Nov. 17-Dec. 2		2	
Sinope	Dec. 3-11	1	4	
Smyrna	Nov. 17-Dec. 2	3	1	
Syria—				
Haifa	Dec. 21		1	
Tiberias	Dec. 3-25	129	68	
Tarsus	Nov. 24-Dec. 2	2	1	
Turkey in Europe:				
Constantinople	Dec. 3-Jan. 28	1,598	787	Total, Nov. 5-Jan. 28: Cases, 2,515; deaths, 1,245.
Do	Mar. 12-Apr. 28	15	5	New outbreak.
Zanzibar	Nov. 8-Dec. 21	131	130	Total, Aug. 5-Dec. 23: Cases, 943; deaths, 912, including previous reports from Mwera, Chwaka, and Mokoton. Chwaka district, Oct. 4-Dec. 31, 332 cases, not included in previous reports.
At sea				Nov. 18-20: 1 fatal case on s. s. Bosnian, en route from Constantinople to Odessa.

YELLOW FEVER.

Brazil:				
Bahia	Jan. 24-Apr. 5	16	8	
Manaos	Jan. 5-Apr. 19	23	23	
Para				May 10, 1 fatal case.
Pernambuco				Year 1912: Deaths, 41.
British Gold Coast:				
Akkra	Mar. 22			Present. Apr. 26 free.
Ecuador:				
Agua Piedra	Dec. 1-31	7	4	
Do	Jan. 1-Mar. 31	10	6	
Bucay	Nov. 15-Dec. 31	3	2	
Do	Jan. 1-Mar. 31	4	2	
Duran	Nov. 1-Dec. 31	3	3	
Do	Jan. 1-Mar. 31	15	9	
Guayaquil	Nov. 1-Dec. 31	25	16	
Do	Jan. 1-Mar. 31	120	64	Apr. 1-30 in Guayaquil and vicinity: Cases, 50; deaths, 22.
Milagro	Nov. 1-Dec. 31	2	2	
Do	Jan. 1-Feb. 28	19	11	
Naranjito	Nov. 1-Dec. 31	3	2	
Do	Jan. 1-Mar. 31	19	10	
Mexico:				
Merida	Apr. 2-10	1	1	From Campeche.
Senegal:				
Dakar	Dec. 7			Present.
Venezuela:				
Caracas	Nov. 1-Dec. 31	9	2	In September 2 deaths and in October 1 death not previously reported. Feb. 7, 1 case.
Do	Jan. 1-31	2		

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

Reports Received from Dec. 27, 1912, to May 23, 1913—Continued.

PLAGUE.

Places.	Date.	Cases.	Deaths.	Remarks.
Afghanistan:				
Tchebel-Bagdareh	Sept. 1-30			And vicinity, 100 deaths daily. Present to Oct. 29.
Arabia:				
Aden	Apr. 9-28	17	11	
Oran—				
Debai	Feb. 16			Present.
Argentina:				
Rosario	Jan. 4	4	1	Endemic.
Brazil:				
Bahia	Jan. 12-Apr. 5	20	8	
Pernambuco	Nov. 1-Jan. 31		11	Year 1912: Deaths, 20.
Rio de Janeiro	Nov. 3-Mar. 1	24	9	Year 1912: Cases, 21. Mar. 22 cases in isolation hospital.
Santos	Dec. 1	2	2	
British East Africa	Jan. 14-Feb. 26		17	
Dagoretti	Jan. 14-Feb. 5	1		
Khambu	Nov. 16-Dec. 8	2		
Kisumu	Dec. 8-28	7		
Do	Jan. 14-Feb. 26	7		
Mombasa	Oct. 1-Dec. 25	16	12	Free Nov. 18.
Do	Feb. 6-26	5		
Nairobi	Nov. 16-Feb. 26	12	1	
Canary Islands:				
Teneriffe—				
Santa Cruz	Feb. 21-27		5	
Chile:				
Antofagasta	Feb. 12			Present.
Iquique	Jan. 8-Mar. 8	11	5	
Taltal	Oct. 22-28	3		
China:				
Amoy	Jan. 17-Apr. 15			Few sporadic cases. Pneumonic form present and in vicinity.
Hai An	Mar. 8			Present in pneumonic form in 2 localities in vicinity about 48 miles from Amoy.
Hoihow	Nov. 1-30			Present.
Kulangsu	Jan. 17	3		International settlement of Amoy.
Hongkong	Jan. 12-Mar. 29	15	15	Total January to September, 1912: Cases, 1,848; deaths, 1,728. May 14, still present.
Manchuria	Dec. 14			Present along the railway between Harbin and Chang-Chun.
Pakhoi	Dec. 1-31	30		Feb. 1, from 10 to 12 deaths daily.
Shanghai	Nov. 18-Dec. 15		2	Dec. 18, present in vicinity of the French settlement. Total 1912: Cases, 9, among natives.
Do	Mar. 31-Apr. 6		1	
Swatow	Apr. 3			Present, and Jan. 9 present in vicinity.
Colombia:				
Santa Marta	Apr. 11			Epidemic at the barracks.
Dutch East Indies				Total Jan. 1-Feb. 28: Cases, 1,094; deaths, 1,039.
Java—				
Kediri	Oct. 6-Dec. 31	406	377	
Do	Jan. 1-Feb. 28	320	287	
Madioen	Oct. 6-Jan. 1	98	96	
Do	Jan. 1-Feb. 28	156	146	
Malang				Total, year 1912: Cases, 1,477; deaths, 1,406, among natives, including Pasoeroean Residency.
Do	Jan. 1-Feb. 28	586	575	
Surabaya	Oct. 6-Jan. 4	43	43	
Do	Jan. 1-Feb. 28	32	31	
Ecuador:				
Duran	Nov. 1-Dec. 31	4	1	
Do	Jan. 1-Mar. 31	9	6	
Guayaquil	Nov. 1-Dec. 31	139	52	
Do	Jan. 1-Mar. 31	139	75	And vicinity, Jan. 1-Feb. 24: Cases, 123; deaths, 61. Apr. 1-30, in Guayaquil and vicinity: Cases, 19; deaths, 6.
Milagro	Dec. 1-31	8	1	
Do	Jan. 1-Mar. 31	10	2	

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

Reports Received from Dec. 27, 1912, to May 23, 1913—Continued.

PLAGUE—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Egypt				Total Jan. 1-Dec. 31, 1912: Cases, 884; deaths, 441. Jan. 1-Apr. 23, 1913: Cases, 272; deaths, 139.
Alexandria	Mar. 2-Apr. 23	41	28	
Cairo	Dec. 30	1	1	
Port Said	Dec. 29	1	1	
Do	Jan. 1-Mar. 5	4	2	
Provinces—				
Assiout	Jan. 22-Apr. 21	33	30	
Behera	Nov. 29-Dec. 12	2	1	
Do	Mar. 10-Apr. 8	5	5	
Benisouef	Jan. 22-Mar. 6	6	4	
Charkieh	Nov. 29-Dec. 12	3	2	
Do	Jan. 2-Mar. 22	16	7	
Favoum	Jan. 19-Apr. 18	37	16	
Galioubeh	Jan. 1-Apr. 23	4	2	
Garbieh	do	7	2	
Do	Nov. 23-Dec. 17	3		
Girgeh	Jan. 1-Apr. 14	2	2	
Do	Dec. 21-25	1	1	
Gizeh	Jan. 1-Apr. 21	21	5	
Keneh	Apr. 15	1		
Menouf	Jan. 1-Apr. 24	46	22	
Do	Oct. 1-Dec. 31	13	7	
Minieh	Nov. 28-Dec. 29	7	4	
Do	Jan. 23-Apr. 23	34	7	
Sohag	Apr. 4	15	6	
Hawaii:				
Honokaa	May 2	1	1	
Kukuihaele	Jan. 11-31	2	2	
Paauhau	May 8	1		
India:				
Bombay	Nov. 17-Apr. 12	1,127	845	
Calcutta	Nov. 9-Mar. 22		151	
Madras	Dec. 29-Jan. 4	1	1	
Karachi	Nov. 19-Dec. 28	14	13	
Do	Mar. 2-Apr. 12	48	39	
Rangoon	Oct. 1-Nov. 30	68	68	
Do	Dec. 29-Mar. 1	205	199	
Provinces				Total, Oct. 27-Dec. 28: Cases, 25,212; deaths, 19,863.
Delhi	Oct. 27-Dec. 28	31	14	
Bombay	do	6,785	5,121	
Madras	do	1,833	1,337	
Bengal	do	60	59	
Bihar and Orissa	do	1,269	1,025	
United Provinces	do	7,844	6,001	
Punjab	do	952	709	
Burma	do	95	85	
Central Provinces	do	404	301	
Mysore	do	1,506	1,114	
Hyderabad	do	1,498	1,212	
Central India	do	70	60	
Rajputana	do	2,862	2,824	
Kashmir	do	3	1	
Provinces				Total, Dec. 29-Mar. 1: Cases, 48,748; deaths, 40,318.
Delhi	Dec. 29-Mar. 1	49	37	
Bombay	do	4,523	3,468	
Madras	do	1,923	1,415	
Bengal	do	96	92	
Bihar and Orissa	do	9,257	7,336	
United Provinces	do	25,540	21,843	
Punjab	do	2,476	2,031	
Burma	do	1,173	1,055	
Central Provinces	do	324	239	
Mysore	do	1,425	1,072	
Hyderabad	do	1,008	831	
Central India	do	18	12	
Rajputana	do	921	882	
Kashmir	do	14	4	
Northwest Provinces	Dec. 29-Feb. 1	1	1	
Indo-China: Saigon	Aug. 20-Dec. 16	58	36	
Japan:				
Taiwan (Formosa)				Total, year 1912: Cases, 223; deaths, 185.
Kagi	Mar. 18-24	41	18	Apr. 2, 10 cases.
Mauritius	Oct. 11-Feb. 6	253	165	Feb. 27, 1 case.

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

Reports Received from Dec. 27, 1912, to May 23, 1913—Continued.

PLAGUE—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Morocco: Rabat	Nov. 1	3		Among the military.
New Caledonia: Numea	Sept. 17–Dec. 2	62	32	7 cases with 2 deaths among Europeans.
Persia: Bushir	Apr. 13–19	13	12	
Peru:				
Departments—				
Ancachs	July 1–31	4		
Do	Aug. 1–31	4	3	
Arequipa	July 1–Aug. 31	12	5	Mollendo, Nov. 17–Apr. 12: Cases, 18; deaths, 9.
Callao	July 1–31	1	1	Present in September; Dec. 2–Jan. 12: Cases, 7.
Ferrenaje	Dec. 23–Jan. 12	1		
Ica	do	1		
Lambayeque	Dec. 2–22	7		Present in September.
Jayanca	do			Present.
Libertad	July 1–Aug. 31	20	9	Huamachuco, Mar. 25, present; Trujillo, Mar. 25, 15 cases in the lazaretto.
Cosma	Dec. 2–22			Present.
Paijan	do			Do.
Salaverry	Dec. 23–Jan. 12	1		
San Pedro	Dec. 2–Jan. 12	27		
Trujillo	do	44		
Lima	July 1–31	3	2	
Do	Aug. 1–31	4	2	Dec. 2–22: Cases, 2.
Piura—				
Catacaos	Dec. 2–Jan. 12			Present.
Paita	do			Do.
Piura	Dec. 23–Jan. 12			Do.
Sulanna	Dec. 2–22			Do.
Philippine Islands:				
Manila	Nov. 10–Mar. 29	18	14	
Provinces				Third quarter, 1912: Cases, 8; deaths, 7. Fourth quarter, 1912: Cases, 39; deaths, 33. Jan. 1–Mar. 8: Cases, 5; deaths, 5.
Russia:				
Don, territory	Nov. 1–Jan. 12			In 6 localities: 38 cases, with deaths.
Hutor Popova (estate)	Nov. 1–15	20	12	Esaoul district.
Libau	Mar. 1–31		1	
Moscow	Dec. 29–Jan. 11	3	1	
Transbaikal district—				
Verneudinsk	Oct. 18–28	3	3	Near Nerchinsk.
Trans-Caspian Ter., Merv	Dec. 9–21	29	29	Pneumonic.
Siam: Bangkok	Jan. 5–Mar. 22		27	
Turkey in Asia: Jiddah	Mar. 10–Apr. 26	26	23	

SMALLPOX.

Arabia: Aden	Jan. 14–Apr. 21	13	2	
Abyssinia: Adis Ababa	Nov. 24–Dec. 21			Present.
Algeria:				
Departments—				
Algiers	Oct. 1–31	11		
Constantine	do	11		
Do	Feb. 1–28	12		
Oran	Oct. 1–Dec. 31	170	10	
Do	Jan. 1–Feb. 28	25	5	
Argentina:				
Buenos Aires	Nov. 1–Dec. 31		7	
Do	Feb. 1–28		2	
Australia:				
Darwin	Feb. 12			1 case in quarantine from s. s. Eastern en route from Japan to Sydney.
Austria-Hungary:				
Bohemia	Apr. 13–19	2		
Dalmatia	Feb. 9–15	1		
Galicia	Nov. 10–Dec. 7	3		
Do	Apr. 15–21	1		
Fiume	Jan. 14–Apr. 24	7	1	
Moravia	Jan. 17–Apr. 21	3		
Trieste	Dec. 8–Apr. 21	55		Returning travelers.

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

Reports Received from Dec. 27, 1912, to May 23, 1913—Continued.

SMALLPOX—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Belgium: Antwerp	Mar. 24-31	1		
Brazil:				
Para	Dec. 8-Feb. 1	2		
Pernambuco	Nov. 1-Mar. 31		185	Year 1912: Deaths, 762.
Rio de Janeiro	Nov. 3-Apr. 12	82	21	
British Columbia: Vancouver	Feb. 2-Mar. 1	2		
British East Africa:				
Mombasa	Dec. 1-31	17	10	
Do	Feb. 1-28	16	3	
Canada:				
Provinces—				
British Columbia—				
Fernie	Feb. 23-Mar. 1	12		Apr. 22, 1 case in vicinity.
Vancouver	Apr. 13-19	1		
Manitoba—				
Winnipeg	Mar. 30-Apr. 19	11		
Ontario—				
Cornwall	Mar. 16-22	2		
Fort William	Mar. 31-Apr. 16	4		
Hamilton	Jan. 1-Mar. 31	60		
Niagara Falls	Feb. 1-Apr. 21	21		
Ottawa	Jan. 4-May 3	45		
Port Arthur	Mar. 16	1		
Toronto	Dec. 1-May 3	23		
Windsor	Feb. 9-Apr. 26	12		
Quebec—				
Montreal	Dec. 15-May 10	172	1	
Quebec	do	35		
St. Johns	Jan. 12-Apr. 26	25	1	
Chile:				
Punta Arenas	Oct. 31-Nov. 30	3		Oct. 31, 1 case in vicinity.
Do	Jan. 1-31	1		
China:				
Amoy	Mar. 15		1	Jan. 4-Apr. 5, present.
Kulangsu	Jan. 12-Feb. 29	1	1	Apr. 5, present.
An Kho	Jan. 4			Epidemic; 2 days' journey from Amoy.
Chungking	Nov. 3-Jan. 22			Present.
Dalny	Jan. 12-18	1	1	
Hankow	Dec. 29-Jan. 4	1		
Harbin	Dec. 1-31	6		
Do	Jan. 17-Feb. 13	2		
Hoihow	Jan. 3			Do.
Hongkong	Nov. 24-Mar. 29	75	52	
Nanking	Dec. 7-Mar. 8			Do.
Shanghai	Nov. 18-Apr. 6	50	171	Deaths among natives. Year 1912: Cases, 144.
Tientsin	Nov. 17-Apr. 12	9	18	
Costa Rica: Limon	Feb. 1	2	2	
Dutch East Indies:				
Java—				
Batavia	Nov. 9-Mar. 15	42	12	Jan. 5-11, 10 cases, with 5 deaths in the district, mainly in Samarang.
Samarang	Oct. 4-24	57	23	
Do	Jan. 5-Mar. 15	906	202	
Surabaya	Mar. 16-29	2	1	
Egypt:				
Alexandria	Dec. 9-Apr. 22	53	13	
Cairo	Nov. 12-Apr. 1	29	6	
Port Said	Dec. 3-31	1	1	
France:				
Marseille	Nov. 1-Mar. 31		23	
Nantes	Jan. 5-Mar. 31	8		
Nice	Feb. 1-28	2		
Paris	Dec. 1-Apr. 26	50	1	
Germany				Total: Nov. 24-30, 5 cases not included in report, p. 2231, vol. xxvii; Dec. 1-Apr. 26, 60 cases.
Breslau	Jan. 19-25	1		
Hamburg	Jan. 10-Mar. 29	4		
Kehl	Feb. 1-28		1	
Gibraltar	Dec. 9-Mar. 16	3	1	
Great Britain:				
Hull	Mar. 8-Apr. 1	5		
Liverpool	Jan. 1-Apr. 26	4	1	
Newcastle on Tyne	Feb. 9-15	15		
Sheffield	Feb. 26-Mar. 2	1		

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

Reports Received from Dec. 27, 1912, to May 23, 1913—Continued.

SMALLPOX—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Greece:				
Athens	Feb. 10–Apr. 5	1	3	
Patras	Mar. 3–Apr. 27		38	Epidemic.
Piræus	Jan. 1–31	16		
Hawaii: Paauhau	May 2	1		
Honduras: Trujillo	Feb. 2–8	1		
India:				
Bombay	Nov. 17–Apr. 12	219	91	
Calcutta	Dec. 1–Mar. 8		27	
Karachi	Dec. 1–Apr. 12	70	23	
Madras	Dec. 1–Mar. 22	45	10	
Rangoon	Oct. 1–Feb. 22	55	15	
Indo-China: Saigon	Aug. 20–Dec. 23	3	3	
Italy:				
Leghorn				Year 1912; Cases, 315; deaths, 19.
Naples	Mar. 16–29	4	1	
Palermo	Dec. 15–Apr. 12	40		
Turin	Feb. 3–Mar. 2	5		
Japan				Total, year 1912: Cases, 14; deaths, 1.
Hokkaido	Jan. 1–31	1		
Nagasaki	Nov. 1–Apr. 20	5	2	
Taiwan (Formosa)				Year 1912: Cases, 4.
Kangawaken	Jan. 1–31	1		
Yokohama				Jan. 1–13, 2 cases from s. s. Pera from London via ports.
Malta	Feb. 1–28	1		
Mexico				Feb. 16: Cases, 1,500 to 2,000, with 10 per cent of deaths, mainly along the western coast. Jan. 30–Feb. 16: Present in Aguierre, Cajame, Corral, Esperanza, Navojca, Puga, and Tarin.
Aguascalientes	Dec. 9–Apr. 27		46	
Chihuahua	Dec. 9–Apr. 13		24	
Durango	Dec. 1–Mar. 31		157	
Guadalajara	Jan. 5–Apr. 26	29	3	
Hermosillo	Feb. 16–May 3	16		
Juarez	Mar. 1–29	2		
Manzanillo	May 7			2 cases among troops.
Mazatlan	Jan. 1–7	2		
Mexico	Nov. 17–Mar. 8	118	43	
Monterey	Mar. 24–Apr. 20		5	
Salina Cruz	Nov. 17–Apr. 19	15	6	
San Luis Potosi	Sept. 15–Mar. 15	9	3	
Sonora—				
Agua Zarca	Jan. 30	2		
Nogales	do	1		
Tamaulipas, State	Apr. 16			Epidemic in Chamal, 100 miles north of Tampico.
Veracruz	Jan. 26–Apr. 5	13	1	1 case imported from Pasco del Macho. Apr. 13–May 3: Cases, 28; deaths, 4.
Netherlands: Rotterdam	Dec. 22–28		1	
Newfoundland: St. Johns	Feb. 23–May 3	11		
Peru:				
Callao	Sept. 1–14			Present.
Lima	do			Do.
Mollendo	Nov. 24–Dec. 7	5	1	
Salaverry	Dec. 4–11	1		
Philippine Islands: Manila	Dec. 21			1 case removed from s. s. Maulban to the San Lazaro Hospital. Third quarter, 1912: Cases, 9; deaths, 0. Fourth quarter, 1912: Cases, 16; deaths, 0.
Portugal: Lisbon	Dec. 1–Apr. 26	52		
Roumania				Total, Oct. 1–31: Cases, 6.
Russia:				
Batoum	Dec. 1–31	1		
Libau	Dec. 16–Apr. 20	5		
Moscow	Dec. 8–Apr. 12	43	10	
Odessa	Nov. 17–Apr. 12	9	3	
St. Petersburg	Nov. 24–Apr. 12	126	18	
Warsaw	Sept. 22–Feb. 1	43	40	
Riga	Dec. 1–31	1		
Siberia—				
Omsk	Jan. 1–27	7		
Vladivostok	Dec. 15–28	4	1	
Do	Jan. 1–13	4		

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

Reports Received from Dec. 27, 1912, to May 23, 1913—Continued.

SMALLPOX—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Servia: Belgrade	Dec. 22-28	2		
Siam: Bangkok	Nov. 10-Mar. 22		11	
Spain:				
Almeria	Dec. 1-31		40	
Do	Jan. 1-Mar. 31		22	No longer epidemic.
Barcelona	Dec. 1-May 3		204	
Cadiz	Nov. 1-Dec. 31		7	
Do	Feb. 1-Mar. 31		2	
Madrid	Nov. 1-Dec. 31		34	
Do	Jan. 1-Mar. 31		64	
Malaga	Dec. 1-31		1	
Seville	do		27	
Do	Jan. 1-Mar. 31		27	
Valencia	Nov. 14-Apr. 26	129	4	
Straits Settlements:				
Singapore	Nov. 24-Apr. 5	16	5	
Penang	Mar. 31-Apr. 5	1		
Sweden: Stockholm	Oct. 8-21	3		
Switzerland:				
Cantons—				
Aargau	Dec. 15-Apr. 5	7		
Basel	Nov. 14-Apr. 19	45		
Grisons	Dec. 1-Feb. 1	15		
Turkey in Asia:				
Beirut	Dec. 8-Apr. 12	91	14	
Damascus	Mar. 8			Present.
Mersina	Mar. 9-Apr. 20	95	45	
Smyrna	Nov. 24-Dec. 14		5	
Do	Jan. 19-Mar. 22		11	
Tarsus	Apr. 12			Do.
Trebizond	Mar. 9-15			Do.
Turkey in Europe:				
Constantinople	Dec. 1-28		43	
Do	Dec. 29-Apr. 19		147	
Union of South Africa: Durban	Feb. 2-8	1		Imported.
Uruguay:				
Montevideo	Dec. 1-31	3		Last previous case in May, 1912. Feb. 18, present.
Do	Jan. 1-Feb. 28	3	1	
West Indies:				
Barbados	Mar. 8	1		From Grenada.
Grenada				May 8, 3 cases; in vicinity of St. Georges.
Concord	Apr. 23	1		
La Filette	do	1		
Pomme Rose	Apr. 17	3		
Zanzibar	Nov. 8-Feb. 7	22	3	

SANITARY LEGISLATION.

COURT DECISIONS.

COURT OF APPEALS DISTRICT OF COLUMBIA.

Dirty or Impure Milk Declared to be Adulterated Within the Meaning of the Pure Food Act. (No. 2466, Decided Feb. 25, 1913.)

CHARLES G. DADE, PLAINTIFF IN ERROR, *v.* UNITED STATES OF AMERICA.

STATUTES, CONSTRUCTION OF—PURE FOOD ACT—ADULTERATED MILK.

1. The pure food and drugs act (34 Stat., 770) is a police regulation enacted to conserve the public health, and is to be construed liberally to meet the evils intended to be embraced within its provisions.
2. Food offered for sale in a filthy, decomposed, or putrid condition, caused either from an inherent condition or an external substance, or consisting of or containing filthy, decomposed, or putrid matter, or containing a foreign substance neither filthy, decomposed, nor putrid in itself, but which causes the food from contact with it to decompose or become filthy or putrid, will be held to come within the act.
3. Milk found to be impure will be held to be adulterated within the meaning of the act.

In error to the police court of the District of Columbia to review a judgment convicting the defendant of a violation of the pure food act. Affirmed.

Mr. Henry E. Davis for the plaintiff in error.

Mr. C. R. Wilson, Mr. John Lewis Smith, and Mr. J. A. Cobb for the United States.

Mr. Justice Van Orsdel delivered the opinion of the court:

This case is here in error to the police court of the District of Columbia. Plaintiff in error was convicted of violating the following provision of the pure food and drugs act:

"SEC. 7. That for the purposes of this act an article shall be deemed to be adulterated * * * in the case of food. * * * Sixth. If it consists in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter." (34 Stat. L., 770.)

The information charged him with unlawfully offering for sale and selling adulterated milk, "in that it did consist in whole and in part of a filthy, decomposed and putrid animal and vegetable substance."

The facts established by the evidence are that "on February 27, 1911, a pint bottle of milk was purchased from one of the defendant's wagons, and taken to the laboratory of the bacteriological bureau of the health department, where it was analyzed, and found to contain 4,500,000 bacteria on ordinary agar, 37° C., grown for 24 hours, and 89,400,000 bacteria per cubic centimeter. On ordinary agar, 25° C., grown 48 hours, it contained 83,000 bacteria per cubic centimeter of the colon group. It showed gas

fermentation in one ten-thousandth of a cubic centimeter, approximately 15 drops, and one streptococcus to one ten-thousandth of a cubic centimeter."

It appears that the bacterium known as *B. coli* or colon bacillus originates in and is a normal constituent of the colon of all warm blooded animals, is discharged in the excreta and found in milk as the result of fecal contamination. When present in milk it always occurs from either direct or indirect fecal deposit therein; directly from carelessness in permitting particles of feces to get into the milk during the process of extracting the milk from the cow, or in handling it afterwards; indirectly, from dust, vegetation, water, and air, where the bacillus is found—originally derived, however, from animal feces. The evidence discloses the state of the science to be that colon bacillus is a vegetable formation originating in animal intestines, and nowhere else. It is not found in air, dust, water, or vegetation under conditions indicating different origin, or its original derivation from the substances with which it is thus associated. Under favorable conditions, colon bacillus will multiply and develop in milk with great rapidity. The present analysis, in the light of the evidence, reveals the presence of colon bacillus to have resulted from a direct deposit of feces in the milk, due to uncleanly methods in handling the milk.

It appears that the streptococcus is associated frequently with the colon bacillus in the colon of warm-blooded animals, and is discharged in the excreta. It is also found in diseased processes of animals—in boils on human beings, or in abscesses in animals, and in diseased tissues and intestines. While milk may be perfectly sterile in the udder of a healthy cow, streptococci may be found in milk taken from a diseased udder. It, however, may be regarded as strongly conclusive that where colon bacilli and streptococci are found together in large numbers, and under the circumstances here shown they originate directly from fecal matter. They are not found in milk as it flows from a healthy animal. Their presence in milk originally pure indicates contamination from an outside source—as to colon bacillus, always fecal contamination; and usually the same as to streptococcus. Streptococcus may also come from a diseased condition of the cow or from persons handling the milk, but its presence was not so accounted for in this case.

It also appears that the growth of bacteria invariably results in the chemical and natural decomposition of the substance in which they grow. Milk is an animal substance, and bacteria are a vegetable formation in the milk. The bacteria develop and die in rapid succession, causing natural decomposition. Colon bacilli and streptococci destroy the sugar in milk, which is broken up into various acids and gases, thus causing chemical decomposition. For example, sour milk is described as decomposed milk, and may be caused by the action of bacteria. The decomposition of milk sugar into lactic acid is a chemical process that causes milk to sour.

This case was not prosecuted upon the assumption that bacteria, as living vegetable organisms, are in themselves either filthy, decomposed, or putrid; but upon the theory, as fully sustained by the evidence, that the bacteria constantly develop and die, causing filthy vegetable decomposition; that the colon bacilli and streptococci found in the milk established the presence of fecal matter; that streptococci especially are a menance to health; that whether the streptococci came into the milk through fecal deposit, or from a diseased condition of the cow or of those handling the milk, the vice is the same; and that these two groups of bacteria especially cause decomposition of the milk.

The pure food and drugs act is a police regulation enacted to conserve the public health. It will be construed liberally to meet the evils intended to be embraced within its provisions. (United States *v.* Corbett, 215 U. S., 233; District of Columbia *v.* Gardiner, 41 Wash. Law Rep., 34, present term; Galt *v.* United States, 41 Wash. Law Rep., 66, present term.) We are not unmindful of the rule that police regulations to be valid must be reasonable, necessary, and not unduly oppressive. The lawmaking power, in their enactment, takes into consideration the public sentiment

of the community as a measure of the degree of regulation to which private property shall be subjected for the public good, and nowhere do the courts so completely reflect the state of public opinion as in deciding cases involving the exercise of the police power. Measures looking to the public welfare are no longer tested by the strict letter of the Constitution. Doubtless many modern expressions of the legislative will, in the exercise of its police power, would have been held unconstitutional if enacted at an earlier period. But public opinion, keeping pace with an advancing civilization, is the progressive factor which calls for an enlarged invasion of private rights for the public good, and which prompts courts to give greater elasticity to constitutional limitations. In flexibility of construction lies the possibility of progress and the vitality of the Constitution. Therefore, some of the technical distinctions sought to be applied by counsel for plaintiff in error in construing the act before us may be disposed of by the suggestion that food offered for sale in a filthy, decomposed, or putrid condition, caused either from an inherent condition or an external substance; or "consisting of" or containing filthy, decomposed, or putrid matter; or containing a foreign substance, neither filthy, decomposed, nor putrid in itself, but which causes the food from contact with it to decompose or become filthy or putrid, will be held to come within the act. It is beyond dispute that the milk, when taken from the wagon of plaintiff in error in the condition in which it was being sold to his customers, was both filthy and decomposed.

It is urged that since it is impossible to produce milk entirely free from bacteria the statute imposes a duty impossible of performance, and can not, therefore, be applied to milk, or, if possible of performance, it could only be complied with at so great a cost as to result in the destruction and confiscation of the business. It is not clear from the evidence that the enforcement of the act will produce this result. The present case does not present this difficulty, except in theory, since the contamination was so great as to place it within the statute beyond the domain of speculation. Not only did the milk in question contain bacteria of the colon group, but, as incident thereto, fecal matter, all of which, it appears, may be eliminated by the adoption of cleanly methods in handling the milk. In fact, it appears that samples from the dairy of plaintiff in error have been analyzed which were free from bacteria of the colon group. One witness testified that he "has encountered milk, samples of raw milk and samples of pasteurized milk, free from bacteria of the colon group; has seen samples of defendant's that did not contain them, milk sold as raw milk and analyzed on that assumption."

We are not dealing with a regulation relating to milk alone, but with an act generally regulating the sale of food products. Milk is a food product; and, if found to be impure, it will be held to be "adulterated" within the provisions of the act. There is evidence that it is impossible to produce raw milk which does not contain bacteria; that a limited number of bacteria in milk are practically harmless, and also that certain kinds of bacteria are in fact harmless. It is unnecessary to decide whether, under such circumstances, milk would be held to come within the act, since in the present case adulteration is clearly established. The dividing line between pure and impure or adulterated food is in each instance a question of fact; but, because of the scientific distinctions involved, and the impossibility of producing raw milk entirely free from bacteria, it may be much more difficult of ascertainment in the case of milk than of other food products. Owing to the great difficulty which may be encountered in justly enforcing the law, in the absence of a fixed standard defining what is marketably pure and impure milk, in a case where the adulteration consists alone in the presence of comparatively small numbers of so-called harmless bacteria, it may well be that Congress should give attention to this subject, as has been done in many of the States, and establish a fixed standard for marketable milk, whereby milk found to contain a greater number of bacteria than that fixed by the act should come within the condemnation of the law. With the fact scientifically demonstrated that con-

taminated milk is a dominating factor in the propagation of tuberculosis, typhoid fever, scarlet fever, diphtheria, infantile diarrhea, and other diseases, the subject, in importance, is one of the first magnitude.

The judgment is affirmed with costs, and it is so ordered.

Affirmed.

Chief Justice Shepard concurs in the judgment.

SUPREME COURT OF THE UNITED STATES.

Milwaukee Ordinance Excluding from City All Milk not from Tuberculin-Tested Herds Declared to be Valid. (No. 274, October Term, 1912, Decided May 12, 1913.)

JOHN QUINCY ADAMS, PLAINTIFF IN ERROR, *v.* THE CITY OF MILWAUKEE AND GERHARD A. BADING.

In error to the Supreme Court of the State of Wisconsin.

Mr. Justice McKenna delivered the opinion of the court:

Error to review a judgment of the Supreme Court of Wisconsin sustaining the validity of an ordinance of the common council of the city of Milwaukee regulating the sale of milk.[1]

The ordinance provides that no milk drawn from cows outside of the city shall be brought into the city, contained in cans, bottles, or packages, unless they be marked with a legible stamp, tag, or impression bearing the name and address of the owner of the cows, and unless such owner shall, within one year from the passage of the ordinance, file in the office of the commissioner of health a certificate of a duly licensed veterinary surgeon or other person given authority by the State live-stock sanitary board to make tuberculin tests, stating that such cows have been found free from tuberculosis or other contagious diseases. The certificate is required to give a number which has been permanently attached to each cow and a description sufficient for identification. The certificate must be renewed annually and must show that the cows are free from tuberculosis or other contagious diseases.

A short time before the ordinance was to go into effect this suit was brought against the city and Dr. Bading, its health commissioner, to restrain the enforcement of the

[1] No person shall bring into the city of Milwaukee for sale, either by wagon, cart, train, or any other kind of vehicle, or keep, have, or offer for sale or sell in said city, any milk or cream drawn from cows outside of said city, contained in cans, bottles, or packages, unless such cans, bottles, or other packages containing such milk or cream for sale, shall be marked with a legible stamp, tag, or impression bearing the name of the owner of such cows from which such milk was drawn, giving his place of business, including the name of city, street, and number, or other proper address, and unless the owner or owners of such cows shall, within one year from the passage of this ordinance, file in the office of commissioner of health a certificate of a duly licensed veterinary surgeon, or of any other person given authority by the State live-stock sanitary board to make tuberculin tests, stating that such cows have been tested with tuberculin and found free from tuberculosis or other contagious diseases. Such certificate shall give a number which has been permanently attached to each cow, and a description sufficiently accurate for identification, stating the date and place of such examination, and such certificate shall be good for one year from date of its issuance. Such certificate, however, must be renewed annually and filed in the office of the conmissioner of health, and each such certificate shall show in each case that the animals from which such milk was drawn are free from tuberculosis or other contagious diseases. All milk and cream from sick and diseased cows, or cows fed on refuse or slops from distilleries or vinegar factories, unless such refuse or slops be mixed with other dry sanitary grain or food to a consistency of a thick mush, or other than good wholesome food, or milk that is dangerous or that may affect or be detrimental to life or health, or that has been adulterated, or is below the standard fixed by section 17 of this chapter, or which does not conform to all other provisions of this chapter, shall, upon discovery thereof, be confiscated, forfeited, and immediately destroyed by or under the direction of the commissioner of health, bacteriologist, or officer detailed, who shall, if done in good faith, be held harmless in damage therefor in any suit or demand made. (Ord. No. 159, adopte Mar. 30, 1908.)

ordinance. After a hearing judgment was entered dismissing the complaint, and the judgment was affirmed by the supreme court of the State.

The plaintiff (we shall so call him) alleged that he brought the suit for himself and all other producers of and dealers in pure, wholesome milk, as it involved a question of common interest to many persons. He alleged also the following: He is a farmer, living about 17 miles from Milwaukee, and maintains a large dairy herd of cattle and is enjoying a profitable dairy business, shipping milk into Milwaukee to certain retail milk dealers in the city. His herd is healthy, so far as he is able to know or judge. He keeps his stables wholesome and clean, and if his cows become sick or affected in any way with any infectious or contagious disease, so far as he is able to learn or discover by giving careful attention to his herd in its feeding and care, he removes such animals immediately. So far as he is able to discover, his herd is absolutely free from disease, and the milk he offers for sale in Milwaukee, or will offer for sale, is and will be, so far as he is able to discover, absolutely pure and wholesome; and all that proves to be impure and unwholesome upon being tested in the usual and customary manner will be withdrawn from sale.

Bading, as commissioner of health of the city of Milwaukee, threatens, on and after April 1, 1909, to execute the ordinance and confiscate, forfeit, and destroy all milk shipped by plaintiff and other producers to be sold in Milwaukee contrary to the requirements of the ordinance, unless restrained; and if he does so irreparable injury will be caused plaintiff and such other producers and make their business of maintaining a dairy absolutely unprofitable as well as impracticable.

The tuberculin test required by the ordinance is, as plaintiff is informed and believes, wholly unreliable, untrustworthy, and entirely worthless so far as being a guide or protection to the public as to whether or not the cows tested by it are free from the germs of tuberculosis or any other infectious disease.

The milk threatened to be confiscated, shipped to Milwaukee for sale by plaintiff and other producers, when pure and wholesome is not dangerous to public health because perchance the owners of the cows producing the milk have not had the cows tested or have failed to secure the certificate of a veterinary surgeon or other person as required by the ordinance.

It is alleged that the constitution of the State and the fourteenth amendment of the Constitution of the United States are violated.

A motion to dismiss is made on the ground that the questions in this case, under the decisions of this court, are so far foreclosed as to make their discussion unnecessary. The motion is overruled.

The particular contention of plaintiff is that the ordinance violates the fourteenth amendment to the Constitution of the United States because it discriminates between milk drawn from cows outside of Milwaukee and milk drawn from cows within the city. Therefore the charge is that the ordinance does not affect all persons alike. If we regard the territorial distinction merely—that is, milk from cows outside and milk from cows within the city—there is certainly no discrimination. All producers outside of the city are treated alike. Plaintiff identifies himself in interest with all of them and sues for all of them. He therefore seeks grounds of comparison other than the locality of the dairies and urges that the discrimination exists in the difference between the tests to which cows kept outside of the city are subject and the test to which cows within the city are subject.

To sustain his contention plaintiff in error cites an ordinance of the city which provides that no cows or cattle shall be kept in the city without permit from the commissioner of health, except at places provided or established for purposes of slaughtering, and that the stables and places where such animals may be shall be kept at all times in a cleanly and wholesome condition and properly ventilated, and that no person shall allow any animal to be therein which is affected with any contagious and pestilential disease.

This ordinance was supplemented by various rules made by the health commissioner in regard to cleanliness of the stabling of the animals, keeping from them persons infected or who have been exposed to disease, requiring applications for permits to be accompanied by the certificate of the veterinary surgeon showing that the animals have been tested by the tuberculin test and shown by said test to be free from tuberculosis, and that they are not affected with any infectious or contagious disease. If the animals become subsequently infected they are to be removed from the city or disposed of in the manner provided by law.

Three contentions are, notwithstanding, made: (1) The rules were promulgated after this suit was begun. (2) The commissioner had no authority to make the rules. (3) They are radically different rules from the rules as to cows kept outside of the city.

The third contention is the only one that involves a Federal question. The others involve local questions only, and the supreme court of the State decided that the sale of milk drawn from diseased cows is forbidden within the city, that the health officer may remove a diseased animal to a place where it will not spread infection, and that he may apply any known test to determine whether the animal is afflicted with tuberculosis. Inspection and care, therefore, can be applied to the animals within the city, and it is applied also to the milk drawn from such animals. It can not be applied to animals kept outside of the city. It can only be applied to the milk drawn from them. The court noticed this difference and the difference in the regulations made necessary by it. "There are brought into Milwaukee," the court said, "from outside of the city about 28,000 gallons of milk every day, drawn from more than 10,000 cows. It would be practically impossible to subject this quantity of milk to a microscopic examination or to subject it to what is called in the evidence centrifugal test, which would also require the use of a microscope, although not to the same extent. Each animal within the city can be subjected to an individual examination, a microscopic test of samples of its milk, an inspection as to its condition of health, and the tuberculin test applied directly under the orders of the health commissioner. This is a sufficient basis for a separate ruling as to milk shipped into the city. There are other regulations covering the sale of milk drawn from cows kept within the city."

We concur in the conclusion of the court. The different situations of the animals require different regulations. Cows kept outside of the city can not be inspected by the health officers; they can be inspected by a licensed veterinary surgeon and a certificate of the fact and the identity of the cows and the milk authenticated as required by the ordinance. The requirements are not unreasonable; they are properly adaptive to the conditions. They are not discriminatory; they have proper relation to the purpose to be accomplished. That purpose and the necessity for it we can not question. (Jacobson *v.* Massachusetts, 197 U. S., 11; Laurel Hill Cemetery *v.* San Francisco, 216 U. S., 358; Mutual Loan Co. *v.* Martell, 222 U. S., 225; Purity Extract & Tonic Co. *v.* Lynch, 226 U. S., 192; Crossman *v.* Lurman, 192 U. S., 189; New Orleans Gas Light Co. *v.* Drainage Comm. of New Orleans, 197 U. S., 453.)

In St. John *v.* New York (201 U. S., 633) we said that in considering the classification of a law, not only its final purpose must be regarded, but the means of its administration. The case is quite in point. There regulations were attacked as discriminating between producing and nonproducing vendors of milk with a view to securing its freedom from adulteration; and adulterated milk was defined by law to be that to which something was added or from which the cream was removed or was naturally deficient or taken from cows fed on certain things or when in certain conditions. The regulations were directed to the inspection of samples of milk from the entire herd. A producing vendor could exempt himself from the penalties of the law by proving that his milk was in the same condition as when it left the herd. The nonproducer had not that privilege. St. John, who was a nonproducing vendor, offered to prove such fact as to the milk he offered for sale, but the proof was rejected and he was convicted of violating the law. The conviction was sustained against

his attack of discrimination in the law. In that case, as in this, a disregard of the regulations was sought to be justified by the assertion of the purity of the milk offered for sale.

Plaintiff also contends that the provision of the ordinance which requires milk that does not conform to its requirements to be confiscated, forfeited, and immediately destroyed, takes his property without due process of law.

To sustain his contention, he assumes the purity of his milk, though it has not been tuberculin tested, and then asserts that "milk of this kind can not be confiscated and destroyed simply because it is not accompanied with a certificate of a veterinary surgeon or of some person authorized by the Live-Stock Sanitary Board of the State of Wisconsin, as provided by said ordinance, certifying that the tuberculin test has been applied." But plaintiff overlooks the allegation of his complaint. His allegation is, not that his cows are free from infectious or contagious disease, but only "so far as he is able to learn or discover." And the allegation of his willingness to withdraw tainted milk from sale depends upon the same contingent knowledge or information. He overlooks also the findings of the courts against the sufficiency of his information and their demonstration of the necessity of the tests established by the ordinance. But even if the necessity of the tests be not demonstrated and the beliefs which induced them may be disputed, they can not be pronounced illegal. In Laurel Hill Cemetery *v.* San Francisco, supra, we expressed the deference which must be accorded to local beliefs, saying that we would not overthrow an exercise of police power based on them to protect health merely because of our adherence to a contrary belief. It will be observed, therefore, that the contention of plaintiff is without foundation and that the ordinance is not an arbitrary and unreasonable deprivation of property in a wholesome food, but a regulation having the purpose of and found to be necessary for the protection of the public health.

The police power of the State must be declared adequate to such a desired purpose. It is a remedy made necessary by plaintiff acting in disregard of the other provisions of the ordinance; that is, failing to have his cows tested and their milk authenticated as prescribed. The city was surely not required to let the milk pass into consumption and spread its possible contagion. This seems to be the alternative for which plaintiff contends, and might occur. All milk produced outside of the city had amounted, the supreme court said, to 3,500 8-gallon cans daily. Criminal pains and penalties would not prevent the milk from going into consumption. To stop it at the boundaries of the city would be its practical destruction. To hold it there to await judicial proceedings against it would be, as the supreme court said, to leave it at the depots "reeking and rotting, a breeding place for pathogenic bacteria and insects during the period necessary for notice to the owner and resort to judicial proceedings."

We agree with the court that the destruction of the milk was the only available and efficient penalty for the violation of the ordinance. The case, therefore, comes within the principle of the cases we have cited and of Lieberman *v.* Van De Carr (199 U. S., 552). In other words, as the milk might be prohibited from being sold, at the discretion of the board of health, and even prohibited from entering the city (Reed *v.* People of Colorado, 187 U. S., 137), a violation of the conditions upon which it might be sold involves as a penalty its destruction. Plaintiff sets up his beliefs and judgment against those of government and attempts to defeat its regulations, and thereby makes himself and his property a violator of the law. In North American Storage Co. *v.* Chicago (211 U. S., 306, 315) we said, by Mr. Justice Peckham, that food which is not fit to be eaten, "if kept for sale or in danger of being sold, is itself a nuisance, and a nuisance of the most dangerous kind, involving as it does the health, if not the lives, of persons who may eat it." And it was decided that in such case the food could be seized and destroyed and that a provision for a hearing before seizure and condemna-

tion was not necessary. It was also decided that the owner of the food had his remedy against the arbitrary action of the health officers.

It is, however, said that plaintiff is precluded from such remedy because the ordinance expressly provides that the health officers "shall be held harmless in damages" for their acts "if done in good faith." It may be that that portion of the ordinance is separable if invalid. The supreme court of the State said it was not necessary to pass upon the provision. What view it might entertain it did not clearly express. In determining the validity of the provision the court said that it "must assume that the ordinance is otherwise valid," and that it could not presume that plaintiff would disregard the ordinance held by it "to be valid or place his property in a condition to invite its destruction." "Self-inflicted damage," the court added, "is not recoverable. The open judicial inquiry is in such case, Was the damage self-inflicted?" In other words, as we understand the court, a question upon that portion of the ordinance has not yet reached a justiciable stage. There is certainly no destruction of the milk impending. Indeed, according to the allegations of the complaint, there is a threat only, to be executed if plaintiff should take milk into the city, which, though he alleges he is anxious to do, he may not do.

Judgment affirmed.

STATE LAWS AND REGULATIONS PERTAINING TO PUBLIC HEALTH.

ARKANSAS.

Board of Health—Organization and Duties. (Act No. 96, Feb. 25, 1913.)

SECTION 1. Within 30 days after the passage of this act it shall be the duty of the governor to appoint a State board of health, consisting of seven persons, one of whom shall be chosen from each congressional district in this State. In the event that the said congressional districts be increased or decreased, that the membership of said board shall increase or decrease in accordance therewith. Each member of the State board of health shall be a graduate of a legally constituted and reputable medical college and of at least seven years' experience in the practice of his profession in this State, and shall be of good professional standing.

SEC. 2. Each of the members of the State board of health so appointed shall take the oath of office prescribed by the constitution for State officers, and be commissioned by the governor in the same manner as other State officials. The members of the said board shall hold office for four years: *Provided*, That the first members so appointed shall serve as follows: Two until January 1, 1915; two until January 1, 1916, and three until January 1, 1917: *Provided, however*, That the Secretary shall hold office for four years from appointment. The members first appointed shall determine among themselves their respective terms of office, they shall elect one of their members as president, and they shall also elect a secretary, who may or may not be a member of the board, and who shall possess all the qualifications and have all the powers of the members of the board. The said secretary shall be known as the State health officer, and shall be the executive officer of the board, and perform such duties as may be prescribed by the board or required by this act.

SEC. 3. The Arkansas State Board of Health shall meet at least once a year, or as often as may be necessary in the interest of the public health, upon the call of the president or a majority of the members of the board.

SEC. 4. The Arkansas State Board of Health may adopt by-laws regulating the transaction of its business and provide therein for the appointment of committees to whom it may delegate authority and power for all duties committed to them, under the direction and subject to the control of the State board of health, and may also adopt and use an official seal. A majority of the members of the board shall constitute a quorum for the transaction of business and perform such duties as the board may prescribe.

SEC. 5. The State board of health shall have general supervision and control of all matters pertaining to the health of the citizens of this State. It shall make a study of the causes and prevention of infectious, contagious, and communicable diseases, and, except as otherwise provided for in this act, shall have direction and control of all matters of quarantine regulations and enforcement, and shall have full power and authority to prevent the entrance of such diseases from points without the State, and shall have direction and control over all sanitary and quarantine measures for dealing with all such diseases within the State, and to suppress the same and prevent their spread.

SEC. 6. Power is hereby conferred on the Arkansas State Board of Health to make all necessary and reasonable rules and regulations for the protection of the public

health, and for the general amelioration of the sanitary and hygienic conditions within the State, for the suppression and prevention of infectious, contagious, and communicable diseases, and for the proper enforcement of quarantine, isolation, and control of such diseases: *Provided, however*, That where a patient can be treated with reasonable safety to the public health, he shall not be removed from his home without his consent, or the consent of the parents or guardian in case of a minor, and said rules and regulations, when so made, shall be printed in pamphlet form, with such numbers of copies as may be necessary for the distribution for information of health, bodies, health and sanitary officers, and the public generally. But the State board of health shall not regulate the practice of medicine or healing, nor interfere with the right of any citizen to employ the practitioner of his choice.

SEC. 7. That the State board of health shall establish a bureau of vital statistics and provide an adequate system for the registration of births and deaths, by formulating and promulgating rules and regulations prescribing the method and form of making such registration.

SEC. 8. That the secretary of the State board of health shall be the State registrar of vital statistics, and it shall be his duty to carry into effect the rules, regulations, and orders of the State board of health. The board shall provide suitable apartments, properly equipped with fireproof vaults and filing cases, for the permanent preservation of all official records.

SEC. 9. That for the purposes of this act the State registrar shall divide the State into registration districts, defining and designating the boundaries thereof and appointing local registrars in each district. Each registration district shall have at least one county therein.

SEC. 10. That each local registrar shall be paid the sum of 25 cents for each birth certificate and each death certificate properly and completely made out and registered with him, correctly recorded and promptly returned by him to the State registrar, as required by the rules and regulations. And in case no births were registered during any month the local registrar shall be entitled to be paid the sum of 25 cents for each report to that effect, but only if promptly made in accordance with the rules and regulations. All amounts payable to a registrar under the provisions of this section shall be paid by the treasurer of the county in which the registration district is located, upon certification by the State registrar. And the State registrar shall annually certify to the treasurers of the several counties the number of births and deaths properly registered, with the names of the local registrars and the amounts due each at the rates fixed herein.

SEC. 11. That the State registrar shall upon request furnish any applicant a certified copy of the record of any birth or death registered under the provisions of this act, for the making and certification of which he shall be entitled to a fee of 50 cents, to be paid by the applicant. And any such copy of the record of a birth or death, when properly certified by the State registrar to be a true copy thereof, shall be prima facie evidence in all courts and places of the facts therein stated. For any search of the files and records when no certified copy is made the State registrar shall be entitled to a fee of 50 cents for each hour or fractional part of an hour of time of search, to be paid by the applicant. And the State registrar shall keep a true and correct account of all fees by him received under these provisions and turn the same over to the State treasurer each month.

SEC. 12. That any person, firm, or corporation who shall violate any rule, regulation, or order of the State board of health relative to recording, reporting, or filing information for the bureau of vital statistics, or who shall willfully neglect or refuse to perform any necessary and reasonable duties imposed upon them by said orders, or who shall furnish false information for the purpose of making incorrect records for said bureau, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than $5 nor more than $100, or be imprisoned in the county jail

not exceeding 60 days, or suffer both fine and imprisonment, in the discretion of the court.

SEC. 13. *Be it further enacted*, That the office of county physician and county boards of health shall be abolished within the several counties of this State, and that instead the office of county health officer is hereby created in each county within this State: *Provided, however*, That county physicians now in office shall serve as county health officers until the expiration of their present term. Within 30 days after the passage of this act the State board of health, with the approval of the county judge, shall appoint for each county in this State a county health officer, who shall serve for a term of two years. The county health officer shall be a graduate of a reputable medical college, and shall have at least three years' experience in the practice of medicine in this State. Each county health officer shall perform such duties as have heretofore been required of county physicians with relation to caring for the prisoners in county jails, and in the caring for the inmates of county poor farms, hospitals, discharging the duties of county quarantine, and such other duties as have been lawfully required of the county physician, and shall perform such duties as may be prescribed for him under the rules, regulations, and requirements of the Arkansas State Board of Health. He shall also be required to aid and assist the State board of health in all matters of local quarantine, inspection, prevention and suppression of disease, vital and mortuary statistics, and general sanitation within his county, and make such reports to the State board of health as shall be demanded of him. The county health officer shall receive for his services an annual salary to be fixed by the county court, which may be payable monthly out of the county treasury. Upon the failure of the county health officer to perform the duties of his office as herein required, he may be removed by the State board of health.

SEC. 14. There is hereby established in each city of the first class and each city of the second class in this State a city board of health, which shall be constituted as follows: The mayor of such city shall at the first meeting of the city council after assuming the duties of his office appoint not less than five persons, two of whom shall be physicians, who shall be graduates of reputable medical colleges and of good professional standing, who shall constitute a city board of health, and shall have and exercise the powers conferred upon such boards by law and by the ordinances of such city; and the mayor of such city shall be ex officio a member of said board.

SEC. 15. The offices of city physician for the several incorporated cities and towns within this State, and boards of health in incorporated towns, are hereby abolished, and instead created the office of city health officer: *Provided, however*, That city physicians now in office shall serve as city health officers until the expiration of their present term.

SEC. 16. The office of city health officer shall be filled by a competent physician, legally qualified to practice medicine within this State, a graduate of a reputable medical college, and of reputable professional standing.

SEC. 17. It is hereby made the duty of the mayor of each incorporated city and town within this State to elect a qualified person to the office of city health officer, said appointment to be approved by a majority of the votes of the city council. The city health officer, after appointment, shall take and subscribe to the constitutional oath of office, and shall file a copy of his appointment with the Arkansas State Board of Health, and shall not be deemed to be legally qualified until said copies shall have been so filed.

SEC. 18. In case the authorities hereinbefore mentioned shall fail, neglect, or refuse to fill the office of city health officer as in this act provided, then the Arkansas State Board of Health shall have the power to appoint such city health officer, to hold office until the local authorities shall fill such office, first after giving 10 days' notice in writing to such authority of the desire for such appointment.

SEC. 19. Each city health officer shall perform such duties as may now or hereafter be required by the city councils and ordinances of city physicians and such duties as may be required of him by general law and city ordinances with regard to the general health and sanitation of towns and cities, and perform such other duties as shall be legally required of him by the mayor, councils, or the ordinances of his city or town. He shall, in addition thereto, discharge and perform such duties as may be prescribed for him under the directions, rules, regulations, and requirements of the State board of health. He shall be required to aid and assist the State board of health in all matters of quarantine, vital and mortuary statistics, inspection, disease prevention and suppression, and sanitation within his jurisdiction. He shall at all times report to the State board of health in such manner and form as shall be prescribed by said board of health the presence of all contagious, infectious, and dangerous epidemic diseases within his jurisdiction, and shall make such other and further reports in such manner and form and at such times as said State board of health shall direct, touching all such matters as may be proper for the State board of health to direct, and he shall aid said State board of health at all times in the enforcement of proper rules, regulations, and requirements in the enforcement of all sanitary laws, quarantine regulations, and vital statistics collections, and perform such other duties as said State board of health shall direct.

SEC. 20. The compensation of city health officers shall be fixed by the mayor and council of the respective towns and cities within this State.

SEC. 21. The State board of health shall establish, equip, and maintain a hygienic laboratory, which shall be used for making analyses of foods and drugs, for the purpose of enforcing pure food and drug laws, and for making investigations of cases and suspected cases of malaria, diphtheria, typhoid fever, tuberculosis, epidemic cerebrospinal meningitis, glanders, hookworm disease, rabies, and other infectious, contagious, and communicable diseases. All investigations conducted in the said laboratory shall be free to the people of this State. The said hygienic laboratory shall be established and maintained at the medical department of the University of Arkansas, in connection with the regular department of chemistry and the department of of bacteriology, and said hygienic laboratory of the State board of health shall be under the direct supervision of the secretary of the State board of health or his authorized assistants.

SEC. 22. All expenses legally and necessary incurred for the work of protecting the public health outside of cities and towns shall be paid by the county in which the expense is incurred; such claims shall be allowed by the county court when proved as other claims against a county are required by law to be proved. From the judgment of the county court upon any such claim the claimant or any taxpayer of the county may appeal to the circuit court, and thence to the supreme court, but every claim must be approved by the county health officer before allowance, and the expense legally incurred for the protection of public health inside corporate limits of cities and towns shall be paid out of the treasury of the cities and towns in which the work is done. *Provided*, That all of their expenditures made by representatives of the State board of health and chargeable under the provisions of this act to any county, city, or town, shall be made only with the advice and consent of the county judge of any said county, or of the mayor and town council in any incorporated town.

SEC. 23. The Arkansas State Board of Health is hereby authorized to publish for general distribution such reports and such other matter as it may deem adapted to promote the interest of the public health of this State.

SEC. 24. The office of the State board of health shall be in the capitol, at Little Rock, and the said board shall be furnished with all necessary equipment and supplies, including laboratory supplies, books, stationery, blanks, furniture, etc., as other officers, necessary for carrying on the work of the board, and to be provided in the capitol building or other suitable building to be designated by the governor.

SEC. 25. The State board of health may appoint and employ an assistant State health officer, who shall be a graduate of a reputable medical college, of good professional standing, and who shall have had five years' experience in the practice of medicine in this State, whose duty it shall be to assist the secretary of the board in a general supervision in the affairs of his office, and in the enforcement of quarantine and sanitation throughout the State.

SEC. 26. The State board of health is hereby authorized to employ such clerical assistants as may be required to faithfully and efficiently discharge all the duties pertaining to the business of the board.

SEC. 27. The secretary of the State board of health shall receive annually a salary of $1,800, and the assistant State health officer shall receive annually a salary of $1,500. The other members of the State board shall receive no salary, but each of said members shall be allowed for each and every day he shall be in attendance upon the meetings of the board the sum of $10, including the time spent in transit, and 3 cents per mile going and coming for actual expenses, to be paid on their vouchers when approved by the secretary of the board by warrant drawn by the auditor against the appropriation provided by law for that purpose. The salaries of clerical and other assistants shall be fixed by the board.

SEC. 28. Every firm, person, or corporation violating any of the provisions of this act, or any of the orders, rules, or regulations made and promulgated in pursuance hereof shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than $10 nor more than $100, or by imprisonment not exceeding one month, or both.

SEC. 29. It shall be the duty of the Arkansas State board of health to make an annual report, through its secretary, in writing, to the governor of this State on or before the 1st day of January of each year, and such report shall include a financial statement covering the expenditures of all funds appropriated for its purposes, and so much of the proceedings of the board and such information concerning vital and mortuary statistics, such knowledge respecting diseases, and such instructions on the subject of sanitation and hygiene as may be thought useful by the board for dissemination among the people, with such suggestions as to legislative action as it may deem necessary.

SEC. 30. All salaries and other expenses provided for by this act not required to be paid by counties, cities, and incorporated towns shall be paid out of the general revenue fund of the State.

SEC. 31. There shall be an annual conference of county health officers and city health officers of this State at such time and place as the State board of health shall designate, at which conference the president or some member of the State board of health shall preside. The several counties, towns, and cities may provide for and pay the necessary expenses of its county health officer or city health officer for attendance upon said conference.

SEC. 32. All laws or parts of laws in conflict with the provisions of this act are hereby repealed.

SEC. 33. Whereas the public peace, health, and safety make it expedient that this act and bill become immediately effective, it shall be in force and effect from and after its passage.

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

CINCINNATI, OHIO.

Nuisances. (Reg. No. 71, Bd. of H., June 12, 1912.)

CARE OF DWELLINGS AND PREMISES.

1. In all houses and structures occupied by human beings for any purpose whatsoever, provided said houses or structures can not be classed as a tenement house, lodging house, hotel, or private one-family dwelling, it shall be the duty of the owner to keep the cellar walls thoroughly whitewashed or painted and to maintain them in this condition; to keep the yards, areas, courts, halls, attics, rooms, roofs, cellars, sheds, and other vacant portions free from all accumulations of dirt, filth, garbage, ashes, rubbish, or other waste material; to supply sufficient covered metallic conveniences or receptacles for ashes, rubbish, garbage, refuse, and other matters, to keep the same in proper condition, and to provide a place in which to keep said receptacles; to provide adequate water-supply fixtures and maintain same at all times of the year; also to provide an adequate number of modern water-flushed toilet fixtures; and it shall furthe-be his duty to provide proper drainage for the yard, court, or outside areas, and to maintain the surface of said yard in a reasonably even and good condition, that drainr age may be efficient.

2. In all single one-family houses or structures or houses where each tenant has his own yard, toilet facilities, etc., it shall be the duty of the tenant to keep his yard, area, court, roof, cellar, attic, rooms, toilet compartment, and all other places clean and free from all accumulations of ashes, rubbish, garbage, refuse, and other waste matters, and the tenant on moving to another location shall leave said premises in a reasonably clean condition.

It shall be the duty of the owner of said variety of structures, before renting the same, to place the property in a reasonably clean condition, to provide at least one modern water-flush toilet fixture, and to provide suitable water fixtures and maintain the same in good condition throughout the year.

3. It shall be the duty of the owner of every structure used for dwelling or business purposes to keep the cellar free from accumulations of water. In case such accumulations occur he shall immediately have such water pumped out and have the cause repaired or conditions altered so that further accumulations will be prevented.

4. It shall be the duty of every property owner to maintain the existing toilet fixtures in working order, and in case a catch basin or water-flushed toilet fixture becomes useless or obstructed to immediately repair the same.

5. It shall be the duty of every property owner to have his yards, drains, cisterns, down spouts, pipes, vaults, catch basins, water-flushed toilets, etc., in such condition that there shall be no leakage into adjoining property, to the damage or inconvenience of the owner or tenant of the same.

6. Whenever no city sewer is provided, or whenever the property is so situated that a vault must be maintained, it shall be the duty of the owner, if the present vault overflows onto adjoining property, to have said vault cleaned and conditions changed or altered so that said vault will not overflow. It shall be the duty of the owner to so

construct existing vaults and vault houses that flies and other vermin and animals will not have free access to the filth. Lime or other suitable disinfectants must be used during the summer months and at other times if the vault is foul.

7. It shall be unlawful for any person to willfully obstruct or damage any toilet or sanitary fixture in or on any piece of property in this city.

8. It shall be unlawful for any person to deposit or throw refuse or organic matter of any kind on any vacant land or lot or private premises in the city unless the same is known to be a public dump, and not on such places if they have been notified to cease dumping by the police, sanitary officers, or property owner.

9. No person shall permit any garbage or offal receptacle, stable, manure pit, barn, fowl coop or yard, slaughterhouse, or other place to become foul, nauseous, or offensive to the public or neighboring individuals.

10. Wherever an ample number of water-flushed toilet fixtures are provided, all privy vaults must be cleaned to the satisfaction of the health department and the holes filled with earth or ashes.

11. The owner or owners of lots or vacant land, on which pools of water stand or stagnate, shall, on notice from the department of health, fill, drain, or otherwise abate the nuisance.

12. No live geese, hens, chickens, ducks, hogs, goats, cows, or other fowl or animals shall be kept in the city so as to create foul odors or be a nuisance, inconvenience, or menace to the health of any neighboring individual.

13. It shall be the duty of the owner of vacant lots strewn or littered with rubbish, paper, cans, garbage, ashes, refuse, or waste matter of any kind to cause said rubbish, etc., to be removed and the lot posted, and when said cleaning and posting have been done it shall be the duty of the sanitary inspectors to notify the persons in all neighboring residences to refrain from further dumping, and to cause the prosecution of any person found littering the lot in the future.

14. Wherever no city sewer is provided in a street, it shall be unlawful to drain waste water of any kind over the surface of the sidewalk, but all water must be conducted by means of suitable pipes beneath the sidewalk to the gutter.

PLACES OF REFRESHMENT.

15. The owners or operators of all soda fountains and other places where drinks, ice cream, etc., are sold at retail to the public must maintain said places in a clean sanitary condition; all glasses, dishes, spoons, etc., must be properly and thoroughly cleaned after each use, and all sirups, crushed fruits, ice cream, etc., must be protected from dirt, dust, flies, and other contaminations.

16. All places where candy, ice cream, mineral waters, bottled drinks, preserved fruits, and other food products are prepared, made, manufactured, combined, assembled, sorted, etc., and all places where such products are sold to the public must be maintained in a clean and sanitary condition.

PUBLIC VEHICLES.

17. Every corporation or person owning, operating, or controlling any car or vehicle for the transportation of persons shall maintain the said cars or vehicles in a sanitary condition and shall provide good and sufficient ventilation for the same.

PLACES OF AMUSEMENT.

18. Every corporation owner or operator of theaters, picture houses, hotels, rooming houses, amusement resorts, and other places where the public congregate shall maintain such places in a sanitary condition and provide ample and adequate toilet facilities for both sexes.

OFFENSIVE ODORS.

20. No person shall burn or suffer to be burned within the city any garbage, bones, refuse woolen, silk, leather, or rubber goods, or other substances so that the same shall give rise to offensive odors or gases.

ABATEMENT OF NUISANCES.

22. All nuisances and faulty conditions described and defined in the above paragraphs shall, when their existence is determined by the health department, be corrected, improved, or eliminated in accordance with the directions and to the satisfaction of the health department.

Tenement Houses—Maintenance of. (Regs. Bd. of H.)

[Reg. No. 22, adopted May 15, 1912.]

No person who is owner or has charge or control of any tenement house or building shall let apartments therein unless such house or building is properly ventilated and provided with properly constructed water-closets or privies, and provided with an adequate water supply, nor shall any such person permit any such house or building or any of the apartments therein to become damp, unhealthy, or overcrowded with occupants.

[Reg. No. 23, adopted June 5, 1912.]

Whenever the department of health shall be satisfied that the number of persons occupying any tenement, building, or room is so great as to be the cause of nuisance or sickness, or whenever the apartments used for lodging are damp or are not properly provided with water, privies, or vaults, the department shall serve a written notice upon the owner or agent to correct or remove the objections named, and if they neglect or refuse to obey such notice the board of health will, after a reasonable length of time, put the same in proper order at the expense of the property owner.

Factories and Offices—Cuspidors to be Supplied in. (Reg. No. 67, Bd. of H., July 24, 1912.)

That every factory, business house, mercantile house, and office provide a cuspidor for each 10 employees of such factory, business house, mercantile house, and office, and in no case shall there be less than one cuspidor, said cuspidor to be placed according to convenience of employees in respect to the distribution of the employees over the floor space. All such cuspidors must be kept clean by the owner or owners of any such factory, business house, mercantile house, and office.

2. Whoever violates any provision of this order and regulation or obstructs or intereres with the execution hereof shall be fined not to exceed $100 or imprisonment for not to exceed 90 days, or both, but there shall be no imprisonment for a first offense and each prosecution shall be as for a first offense unless the affidavit upon which the prosecution is instituted contained the allegation that the offense is a second or repeated offense.

3. If such violation, obstruction, or interference be by a corporation, it shall forfeit and pay to the city of Cincinnati a sum not to exceed $300, to be collected in a civil action brought in the name of the municipality.

4. Any officer of the city of Cincinnati having authority in the matter of this order and regulation who permits a violation hereof shall be subject to fine or imprisonment as provided in section 2 hereof.

CHICAGO, ILL.

Tenement Houses—Frame Additions not Permitted within Fire Limits. (Ord. July 8, 1912.)

SEC. 452. *Frame additions to frame tenement houses within fire limits not permitted—Removal of frame tenement houses.*—No frame addition shall be permitted to any frame tenement house within the fire limits, either by adding to its height or its superficial area.

If a tenement house, standing on wooden supports, is moved to another lot, it shall not again be placed on wooden supports, but shall be placed on a masonry or concrete foundation.

If a frame tenement house, not more than two stories high, is moved from one location to another upon the same lot, it may be set upon wooden posts, and a basement or cellar not to exceed 6 feet 6 inches in height from the floor to the ceiling thereof may be maintained thereunder, and no habitable rooms shall be constructed or occupied in said basement or cellar.

Tenement Houses—Windows in. (Ord. July 8, 1912.)

SEC. 475. *Rooms—Change in existing.*—No room in any now existing tenement house shall hereafter be constructed, altered, converted, or occupied for living purposes, unless it contains a window having a superficial area not less than one-twelfth of the floor area of the room, which window shall open upon a street or alley or upon a yard or court having a superficial area of not less than 25 square feet and a minimum width of not less than 2 feet 6 inches, or unless such room adjoins another room in the same apartment, which other room shall have such a window opening upon such a street, alley, yard, or court, between which two adjoining rooms there shall be an alcove opening equal in extent to at least 20 per cent of the entire wall surface of said room: *Provided, however,* That all of the requirements of sections 439 and 440 of the Chicago Code of 1911 shall be complied with.

Where a frame tenement house is moved from one lot to another, or from one location to another on the same lot, it shall comply with the provisions of section 452 of this chapter.

Tenement Houses—Cellar or Basement Rooms. (Ord. July 8, 1912.)

SEC. 477. *Existing tenements—Living rooms in cellars or basements—When permitted.*—(*a*) In every existing tenement house, no room in an existing cellar or basement shall be occupied for living purposes unless such room shall be at least 7 feet 6 inches high in the clear and have not more than 4 feet 8 inches of such cellar or basement below the finished grade at building: *Provided,* That no such room shall be used for living purposes unless such room shall have a window opening upon a street, alley, yard, or court: *And provided,* That when the windows of any living room front solely upon a street and the floor of such basement is 4 feet 8 inches below the sidewalk grade, such windows shall be located not less than 3 feet back of the lot line: *Provided, however,* That in every case where the height of ceiling of any living room is less than 8 feet 6 inches in the clear the window area of such room shall be at least 15 per cent of the floor area.

(*b*) When a brick or frame tenement house is moved from one lot to another or from one location to another on the same lot, and a basement or story, or both, is constructed under the same, the total height of which is more than 6 feet 6 inches from the floor to the ceiling, the walls of such basement shall be constructed of masonry, according to the provisions of section 658 of the Chicago Code of 1911, and the habitable rooms therein shall comply with the provisions of section 475 of the Chicago Code of 1911, and the space on the lot shall comply with the provisions of section 430 and section 440 of the Chicago Code of 1911.

Construction or Repair of Buildings—Plans for, to be Approved. (Ord. July 22, 1912.)

SECTION 1. That section 239 of the Chicago Code of 1911 be, and the same is hereby, amended by striking out the said section and inserting in lieu thereof the following:

"239. *Constructing buildings contrary to approved plans—Permit made void by deviation from plans—Power to stop work.*—(*a*) It shall be unlawful for any owner, agent, or architect, or for any contractor or builder engaged in erecting, altering or repairing any building, to make any departure from the plans as approved by the commissioner of buildings of such nature that such departure involves any violation of the requirements of this chapter as to buildings of the class in which such building is, or to make any changes in plans or construction affecting means of egress, ventilation, natural lighting, or sanitary conditions without first obtaining the written consent of the commissioner of buildings and of the commissioner of health to such changes. Any such departure from the approved plans involving a violation of the requirements of this chapter or any such change in the plans or construction without the consent of the commissioner of buildings and of the commissioner of health being obtained, as required herein, shall operate to annul the permit which has been issued for such work and shall render the same void.

"(*b*) In case any work is done under a permit authorizing the erection, alteration, or repair of a building or structure, which work is contrary to the approved plans, the commissioner of buildings or the commissioner of health and their assistants shall have power to at once stop such work and to order all persons engaged therein to stop and desist therefrom. Such work shall not be resumed until satisfactory assurance has been given the commissioner of buildings or the commissioner of health that it will be done according to the approved plans or until said commissioner of buildings or commissioner of health has consented, in writing, to the changes made in such approved plans, in either of which cases a new permit must be issued before the work proceeds, for which permit the usual fee shall be paid by the contractor doing such work.

"(*c*) No contractor or builder shall begin any work on any building or structure for which a permit is required until such permit shall have been secured. In case any work is begun on the erection, alteration, repair, or removal of any building or structure without a permit authorizing the same being issued therefor, the commissioner of buildings and his assistants shall have power to at once stop such work and to order any and all persons engaged therein to stop and desist therefrom until the proper permit is secured."

Nuisances—Smoke. (Ord. July 22, 1912.)

SECTION 1. That section 2358 of the Chicago Code of 1911 be, and the same is hereby, amended to read as follows:

"SEC. 2358. The emission of dense smoke within the city from the smokestack of any locomotive, steamboat, steam tug, steam roller, steam derrick, steam pile-driver, tar kettle, or any other similar machine or contrivance, or from any open bin, tank, vat, basin, or other receptacle, or from the smokestack or chimney of any building or premises, excepting for a period of six minutes in any one hour, during which the firebox is being cleaned out or a new fire being built therein, is hereby declared to be a nuisance and may be summarily abated by the smoke inspector or by any one whom he may duly authorize for such purpose Such abatement may be in addition to the fine hereinafter provided. Any person, firm, or corporation owning, operating, or in charge or control of any locomotive, steamboat, steam tug, steam roller, steam derrick, steam pile driver, tar kettle, or other similar machine or contrivance, or from the smokestack or chimney or from any open bin, tank, vat, basin, or other receptacle of any building or premises, who shall cause or permit the emission of

dense smoke, within the city, from the smokestack or chimney of any such locomotive, steamboat, steam tug, steam roller, steam derrick, steam pile driver, tar kettle, or other similar machine or contrivance, or from any open bin, tank, vat, basin, or other receptacle, or from the smokestack or chimney of any building or premises so owned, controlled, or in charge of him, her, or them, except for a period of six minutes in any one hour, during which the firebox is being cleaned out or a new fire being built therein, shall be deemed guilty of a violation of this section, and upon conviction thereof shall be fined not less than $10 nor more than $100 for each offense; and such emission of dense smoke in violation of the provisions of this section shall constitute a separate offense for each and every day on which such violation shall continue."

Nuisances—Refuse, Smoke, Gas, and Odors. (Ord. Aug. 14, 1912.)

SECTION 1. That section 1432 of the Chicago Code of 1911 be, and the same is hereby amended to read as follows:

"SEC. 1432. The owner, lessee, tenant, occupant, or manager of every blacksmith or other shop, forge, coal yard, brickyard, or place where bricks are manufactured, foundry, manufactory, and premises where like business is done, or any factory or premises in which tar or any compound thereof is handled, used, or manufactured, shall cause all ashes, cinders, rubbish, dirt, and refuse to be removed to some proper place, so that the same shall not accumulate at any of the above-mentioned premises, or in the appurtenances thereof, and the same become filthy and offensive; nor shall any such owner, lessee, tenant, occupant, or manager cause or allow any dense smoke, cinders, dust, gas, or offensive odor to escape from any such building, structure, place, or premises, which shall be offensive or prejudicial to the health or dangerous to the life of any person or persons not being therein or thereupon engaged; and it is hereby declared to be a nuisance to permit any ashes, cinders, rubbish, dirt, or refuse to accumulate on any of the above-mentioned premises or the appurtenances thereof and become filthy or offensive, or to cause or allow any dense smoke, cinders, dust, gas, or offensive odor to escape from any such building, structure, place, or premises; and the commissioner of health or any officer designated by him may summarily abate the same."

Morgues and Undertakers' Establishments—Location of. (Ord. Nov. 4, 1912.).

SECTION 1. That section 1238 of the Revised Municipal Code of Chicago of 1911, as subsequently amended, be, and the same is hereby, amended so as to read as follows:

"It shall be unlawful for any person to establish or maintain a morgue or to carry on the business of an undertaker as defined in this article who, in connection with such business, receives at his place of business the body of any dead person for embalming or other purposes on or along any boulevard or pleasure driveway without the written consent of a majority of the property owners according to the frontage on both sides of such boulevard or pleasure driveway in the block in which such morgue or place of business is located; it shall also be unlawful for any person to establish or maintain a morgue or to carry on the business of an undertaker as defined in this article who, in connection with such business, receives at his place of business the body of any dead person for embalming or other purposes on or along any street in any block in which two-thirds of the buildings on both sides of the street are used exclusively for residence purposes without the written consent of a majority of the property owners, according to the frontage on both sides of such street in such block: *Provided*, That nothing herein contained shall apply to persons licensed as undertakers at the time of the passage of this ordinance.

"Said frontage consents shall be obtained and filed with the department of health before a license shall issue for such business."

Cold-Storage Warehouses—Regulation of. (Ord. Dec. 9, 1912,)

DEFINITIONS.

SECTION 1. The term "food" as used in this ordinance shall include any article used for food by man or animal and every ingredient of such article, except nuts, fruit, cheese, and vegetables, and except cured meats, meats in process of curing, and cooked animal fats which have been placed in storage under the supervision of the Federal Government. The term "cold storage" as used in this ordinance shall be construed to mean the storage of articles of food in cold storage or refrigerating warehouses or cold-storage houses or rooms of any kind or nature, whether the same are public warehouses or not.

The term "cold storage or refrigerating warehouse or cold-storage house" as used in this act shall be construed to mean a house or room where refrigerating machinery or ice is used for the purpose of refrigeration or a house or room otherwise artificially cooled and permanently kept at a low temperature in which articles of food are stored and preserved.

COLD-STORAGE FOOD TO BE MARKED.

SEC. 2. It shall be unlawful for any person, firm, or corporation engaged in the business of cold-storage warehouseman or in the business of refrigerating, or in any business in which articles of food as defined herein are kept in cold storage for any purpose whatsoever, to receive any kind of food for cold storage unless the said food is in a pure and wholesome condition, and the food or package containing same is branded, stamped, or marked in some conspicuous place with the day, month, and year when the same is received in storage or refrigeration.

It shall also be unlawful for any person, firm, or corporation engaged in the business of cold-storage warehouseman, or in the business of refrigerating, or in any business in which articles of food as defined herein are kept in cold storage for any purpose whatsoever to permit any such article of food in his, their, or its possession, to be taken from him, them, or it without first having plainly printed, branded, stamped, marked, or written in a conspicuous place upon each and every such article, parcel, or package containing the same the day, month, and year when said foodstuff, article, or package was removed from cold storage or refrigeration, as well as the day, month, and year when same was received in cold storage or refrigeration.

PERIOD OF TIME FOR KEEPING COLD-STORAGE FOODS.

SEC. 3. It shall be unlawful for any person, firm, or corporation engaged in the business of cold-storage warehouseman or refrigerating, or in any business in which articles of food as defined herein are kept in cold storage for any purpose whatsoever, to keep in storage for preservation or otherwise, any kind of food or any article or articles used for food a longer period than 10 calendar months, excepting butter, which may be kept in cold storage for 12 calendar months.

POWERS OF THE COMMISSIONER OF HEALTH.

SEC. 4. The commissioner of health is hereby vested with full power and authority to inspect and supervise all places in this city now used or hereafter to be used for cold storage or refrigerating purposes; and it shall be his duty to make such inspection not less frequently than once in every three months; the commissioner of health and all duly authorized inspectors and agents of such commissioner shall be permitted access to such place or places and all parts thereof at all times for the purpose of seeing that said place or places are kept and maintained in a clean and sanitary manner, and for the purpose of determining whether or not the provisions of this article or any other ordinance or act relating to foodstuffs are being complied with, or for any purpose he may see fit. The said commissioner of health may appoint and designate from time to time such person or persons as he deems fit as his agent or agents for the purpose of making such inspections.

SALES PROHIBITED—INSPECTION—EXTENSION OF TIME.

SEC. 5. It shall be unlawful for any person, firm, or corporation to sell, offer for sale, or give away within the city of Chicago any food which has been kept in cold storage for a period of time longer than that provided for herein except with the consent of the commissioner of health, as hereinafter provided.

The commissioner of health may, upon application or upon making the inspection herein provided for, extend the period of storage beyond the time herein prescribed for any particular lot of goods, if the said goods in question are found upon inspection and examination by the commissioner of health or his assistants to be in proper condition for human food, such extension to be until such time not exceeding 90 days, as he shall consider proper, having in mind the condition of the food at the time such extension is made. The length of time that such further storage may be allowed shall be specified in the order granting such extension. A report on each case in which such extension of time is granted, including all information relating to the reasons for the action of the commissioner of health, the kind and the amount of goods for which the storage period was extended, and the length of time for which the extension was granted, shall be included in a monthly report of the commissioner of health to the mayor.

REPORTS OF WAREHOUSEMAN.

SEC. 6. Every person, firm, and corporation engaged in the business of cold-storage warehouseman, or in the business of refrigerating, or in any business in which articles of food as defined herein are kept in cold storage for any purpose whatsoever, shall submit reports to the department of health upon printed forms to be provided by said department of health, setting forth in itemized particulars the quantity of each and every foodstuff in storage or in the control of said person, firm, or corporation; such report shall be filed on or before the 25th day of January, May, and September of each year, and reports so rendered shall show the true conditions in regard to such matters existing in said cold-storage warehouse or place of cold storage upon the first day of the month in which said report is filed.

TRANSFERS FROM ONE WAREHOUSE TO ANOTHER.

SEC. 7. The transfer of any food from one cold-storage or refrigerating warehouse or cold-storage house to another for the purpose of evading any provisions of this article is hereby prohibited.

PROHIBITS RETURN OF FOOD TO COLD STORAGE WHEN ONCE RELEASED FOR PURPOSE OF PLACING SAME ON MARKET FOR SALE.

SEC. 8. When food has been in cold storage or refrigeration and is released therefrom for the purpose of placing the same on the market for sale, or for any other purpose, it shall be a violation of the provisions of this ordinance to again place such food in cold storage or refrigeration unless said food remains in its original package and is not removed from the premises.

PENALTIES.

SEC. 9. Any person, firm, or corporation violating any of the provisions of this ordinance shall be fined not less than $25 nor more than $200 for each offense, and the conviction of any firm or corporation under any of the provisions of this ordinance shall not operate to relieve any employee or agent of such firm, or officer, agent, or employee of such corporation, from prosecution hereunder.