PUBLIC HEALTH REPORTS

VOL. 50 OCTOBER 4, 1935 NO. 40

DUST STORMS AND THEIR POSSIBLE EFFECT ON HEALTH*

With Special Reference to the Dust Storms in Kansas in 1935

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In the course of the past year, Kansas has experienced a variety of weather conditions. An unusually severe drought prevailed during the past 3 years, extending into the spring of 1935. New high temperature records were established in the summer of 1934, and the total of nearly 300 deaths from excessive heat was four times the previous high of 75 deaths in 1931. As a result of the drought, dust storms of unprecedented intensity and duration occurred during the 3-month period from (including part of the two months) February to May, inclusive, of the present year. During May 1935, the drought was broken and excessive rainfall was recorded in nearly all parts of the State. Floods occurred, especially along the course of the Solomon, Republican, Blue, Kansas, Marias des Cygnes, and Neosho Rivers. Flood waters reached new high marks; homes, crops, livestock, bridges, highways, and public properties have been destroyed; but, fortunately, the loss of human life has been small. By way of contrast, on June 2, when floods were at their height in eastern Kansas, an unusually severe dust storm occurred at Garden City. For variety, an earthquake occurred in northeastern Kansas on March 31. It was of but a few seconds' duration, and no property damage was recorded. Our purpose in this paper, however, is to present certain data in regard to dust storms.

Kansas has experienced droughts previously, and dust storms have occurred in the central west in previous years, but their duration was limited to a few hours or a day at the most, with only one or two or possibly three storms a year. One of us (Brown) visited the dust-stricken area three times during April and May, and each time encountered one or more dust storms. During these trips several individuals were interviewed who had lived in western Kansas for

* Read before the Fiftieth Annual Session of the Conference of State and Provincial Health Authorities of North America at Atlantic City, N. J., June 14-15, 1935.

more than 50 years and each one made the statement that never in his experience or to his knowledge had such severe dust storms occurred in previous years.

The dust area included portions of five States—Colorado, Kansas, New Mexico, Texas, and Oklahoma. To this area was applied, more or less appropriately, the name of "dust bowl." The approximate center of the area was Liberal, Kans., located in Seward County,

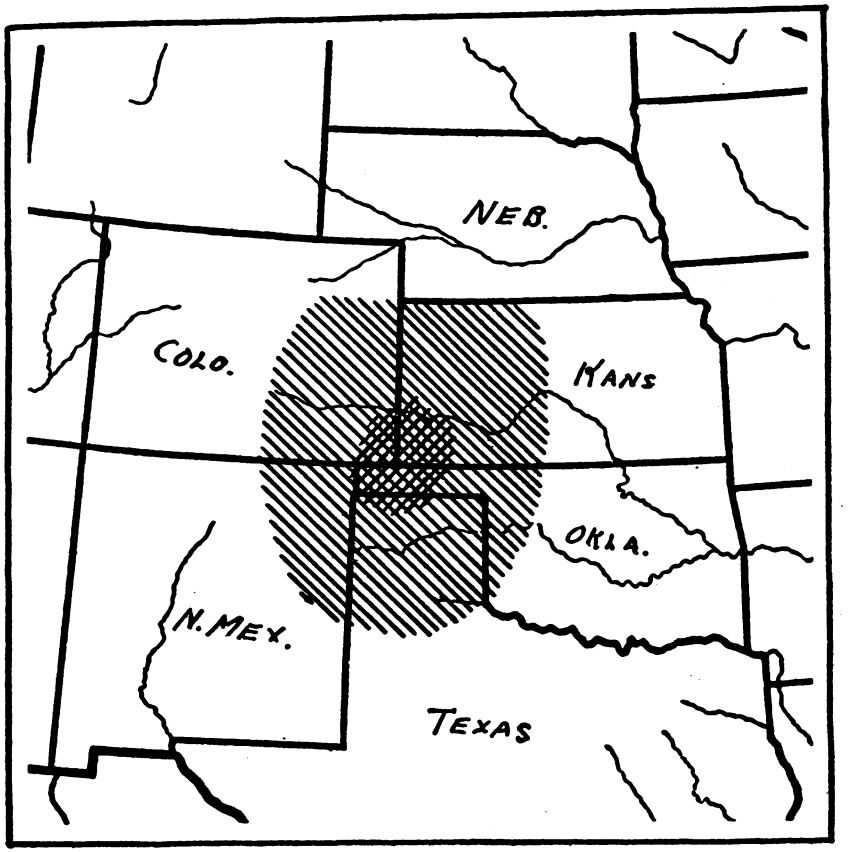

FIGURE 1.—Map showing approximate dust-storm area in five States.

5 miles from the Kansas-Oklahoma State line and some 60 miles from the Kansas-Colorado State line. This area was approximately 400 miles from north to south and 300 miles from east to west. The area most severely affected was within a radius of approximately 100 miles from Liberal. More than 100 counties are located within the area, having an estimated population of approximately 900,000. Severe dust storms were also reported last year in western Nebraska and in the Dakotas.

It is believed that conditions as regards lack of rainfall, dust storms, and illness were similar in each of the five States involved.

On April 29, 1935, under sponsorship of the American Red Cross, a dust conference was held at Liberal with the State health officers of Oklahoma, Colorado, and Kansas in attendance. A comparison of morbidity and mortality for certain of the acute infectious diseases showed similar increases for the three States. Our information and discussion, however, will be limited to conditions existing in Kansas.

Kansas is the geographic center of the United States. The State extends approximately 400 miles east and west and 200 miles north and south. In shape it is almost a perfect rectangle. Contrary to popular belief, Kansas is not flat and featureless. The landscape is far from a monotonous succession of level prairies. It has innumerable hills and picturesque valleys.

The land surface slopes eastward at an average of 8 feet to the mile, with an elevation of 4,135 feet along the western boundary and 734 feet where the Verdigris River crosses the Oklahoma boundary in the southeastern corner of the State. In some places the land slopes steeply or even precipitously. In parts of western and southwestern Kansas are small canyons with steep, bare walls, resembling the gorges of a more mountainous country.

The greater part of western Kansas is covered by a mantle of sand and calcareous clay. The soils of northwestern Kansas comprise a great area formed from wind-deposited material. There are many areas within this region, adjacent to the streams, where the wind-laid soils have been eroded, the underlying rocks exposed, and residual soils formed. These wind-deposited soils are subject to erosion by both wind and water. In the southwest portion of the State are the outwash plains soils (heavy). Both soils are of very fine material, although one is heavier than the other, but both are subject to being carried by heavy winds. Wind erosion occurs during those seasons when the surface soil becomes dry, is not covered by vegetation, and high winds prevail.

The prevailing winds in the western part of the State from April to October, inclusive, are from the south or southwest. During the winter months, north or northwest winds prevail. April is the windiest month of the year.

The average rainfall for the west quarter of the State is approximately 20 inches, with some increase in the total fall in the next 100 miles to the east, increasing to as much as 40 inches or more in the eastern part of the State. A comparison of rainfall recorded in the various counties for the 5-year period 1930–34 shows, almost without exception, noticeable decreases in the past 3 years.

Forty-five Kansas counties are included in the wind-soil erosion area, the total population of which is approximately 330,000. There are nine cities, each with a population in excess of 2,500, the largest being Dodge City, with slightly more than 10,000.

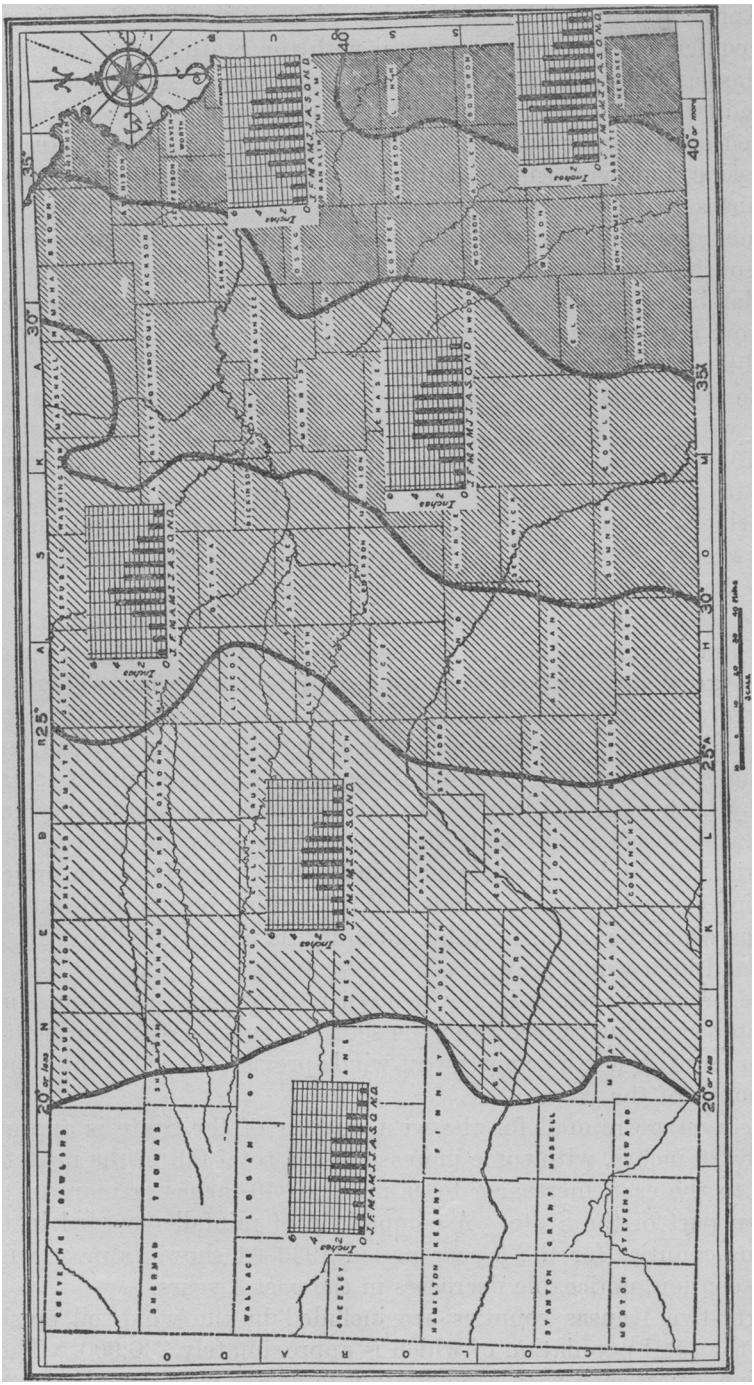

FIGURE 2.—Average rainfall and normal distribution in different areas in Kansas. (Data are for representative stations in each area.)—Courtesy Kansas State Planning Board.

With the exception of this limited number of cities, the area is essentially rural and agriculture is the principal industry. The Kansas State Board of Agriculture estimates that, of the 13,000,000 acres planted to wheat in the fall of 1934, some 9,000,000 acres were sowed in these counties. A limited amount of ground is used for the production of corn, kaffir corn, sargo, and other row crops. The remaining land is used for grazing, and naturally there is some waste land.

There have been two types of dust storms, although both were the result of high winds. One type was the result of the wind blowing the dust from the ground, the cloud rising higher and higher. The other was the result of the dust having been carried into the high air currents and then gradually settling as the wind lessened. Njne storms of the latter type occurred in Topeka during the month of March 1935, the most severe on March 20. On this date, according to S. D. Flora, State meteorologist, visibility decreased steadily from about 4 miles at 8 in the morning to approximately 220 yards at 11:14 a. m., at which it remained until after 4 in the afternoon. The sun was entirely obscured by dust, and artificial illumination was necessary for reading in homes and offices. Airplane pilots are reported to have encountered much dust as high as 10,000 and 15,000 feet.

The most graphic description of a dust storm is that given by A. A. Justice, meteorologist at Dodge City, contained in his official report for the month of April. It follows:

The storm that will longest be remembered came on the afternoon of Sunday, the 14th, striking at 2:40 p. m. Instant darkness followed, lasting for 40 minutes. Then for a period of about 3 hours there was darkness, with occasional breaks of very short duration. By midnight the dust became light.

Many people were caught out in this storm, and these people had a variety of experiences to relate after the storm had passed. Some children were caught in the park and narrowly escaped serious consequences. Many persons spent several hours in stalled motor cars along the highways. Others relate going for considerable distances on hands and knees seeking shelter. No fatalities are known.

As a meteorological phenomenon this storm was very interesting. Many people saw the dust cloud coming, even though visibility was limited to a few miles by the dust then prevailing. The cloud extended east and west as far as could be seen in a straight line. As it came on it presented a rolling, tumbling appearance, something like a great wall of muddy water. The base of the cloud was inky black, the top portion of a lighter color, due to the amount of light falling on the two portions. The height of the cloud was estimated to be about 1,000 feet. According to the most trustworthy observers, the upper portion of the cloud appeared to be rolling forward and downward, the extreme lower front was lined with columns of rapidly rising dust, as though these were forced out by the falling heavier air layers above and behind. Apparently this was a well-developed polar front; all the air movements in it seemed to conform to the idealized structure of a cold front. According to some who took the trouble to check up on the movements of the front of the storm, it was traveling at about 60 miles per hour in this area.

An interesting thing observed was the great number of birds flying straight in front of the onrushing cloud. Hundreds of geese and ducks and smaller birds too

numerous to count were racing for their lives; and in this instance the race was to the swift, for the strong-winged geese and ducks left the cloud at a safe distance behind while the smaller, weaker birds were caught. The almost entire absence of all birds following the storm is one proof of its severity. Another proof of its severity was shown in the great number of jack rabbits seen lying dead on the prairies during the next few days.

Mr. Justice also states in his report:

The total wind movement in April was the greatest for any month of record. There was a total movement of 13,059 miles (uncorrected), as compared with the previous record of 12,733 miles in April 1877. The precipitation was 0.03 inch.

A severe storm occurred on the 10th–11th in connection with the passage of an intense cyclonic disturbance. During the 2 days there were 41 consecutive hours with dense dust, during which time the visibility ranged between 1,000 and 50 feet. The total wind movement during these 41 hours was 1,111 miles; the maximum velocity for 5 minutes, 38 miles. For long periods of time, semi-darkness prevailed during the daylight hours. Traffic was tied up; business was practically at a standstill; no one ventured out unless compelled to. Further damage was done to surviving wheat, and much soil drifting occurred.

Mr. Justice, in his March report, comments as follows:

The storm of the 26th came at 8:06 p. m., after a fine day. The black cloud came silently from the north, blotting out the stars one by one as suddenly and completely as if they had been snuffed out. Visibility dropped at once to about 100 feet and remained so to midnight and past. Maximum wind velocity, 37 miles from the northeast.

From 11 a. m. of the 15th to past sunrise of the 22d the air was so dusty that the horizon was never visible, the visibility most of the time remaining below 1 mile, and for many hours at a time below 1,000 feet.

Official records of the Dodge City office of the Weather Bureau during the 68-day period of February 21 to April 30, inclusive, show 27 days of "light" dust and 28 days of "dense" dust, a total of 55 days of dust. Only 13 days were reported as dust-free. This may be considered as applying to the greater portion of the "dust bowl."

TABLE 1.—*Temperature and relative humidity records for Dodge City and Wichita, for certain days of dust storms*

Date 1935	7 a. m.		12 noon		7 p. m.	
	Temperature	Relative humidity	Temperature	Relative humidity	Temperature	Relative humidity
DODGE CITY						
Feb. 21	49	43	73	16	65	12
Mar. 15	56	42	79	14	79	9
Mar. 19	47	43	60	33	62	47
Mar. 26	46	55	71	18	67	17
Mar. 30	38	60	38	57	43	46
Apr. 10	42	55	43	55	41	55
Apr. 11	39	63	46	48	46	49
Apr. 14	50	32	82	10	53	33
WICHITA						
Mar. 16	38	51	38	43	36	48
Mar. 20	66	80	65	12	65	16
Mar. 23	58	20	70	76	68	16
Apr. 10	57	95	58	34	48	54
Apr. 11	42	67	46	60	46	56
Apr. 14	58	28	----------	----------	58	34
Apr. 26	50	52	65	34	66	35

FIGURE 3.—The approaching dust storm in the Middle West dust storm area. (Copyrighted photograph. Used by permission of copyright owners.)

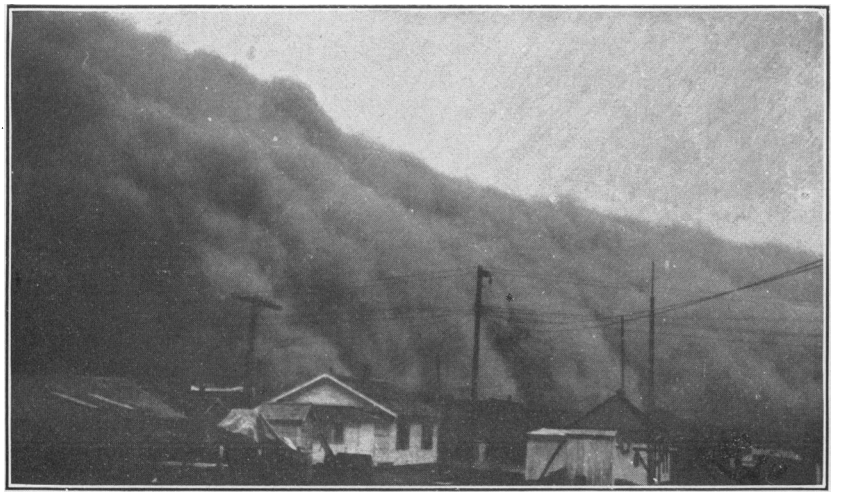

FIGURE 4.—The ominous appearance of the nearing wall of dust. (Copyrighted photograph. Used by permission of copyright owners.)

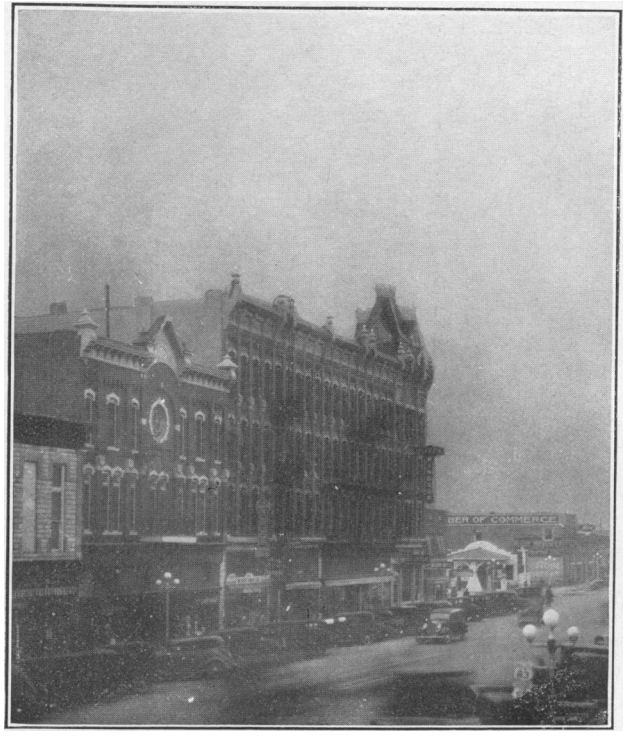

FIGURE 5.—Picture taken at Garden City, Kans., at 5:15 p. m. (Copyrighted. Used by permission of copyright owners.)

FIGURE 6.—Appearance 15 minutes later. Picture taken from same point, at 5:30 p. m. (Copyrighted. Used by permission of copyright owners.)

FIGURE 7.—An originally level wheat field covered with drifts 2 to 4 feet high.

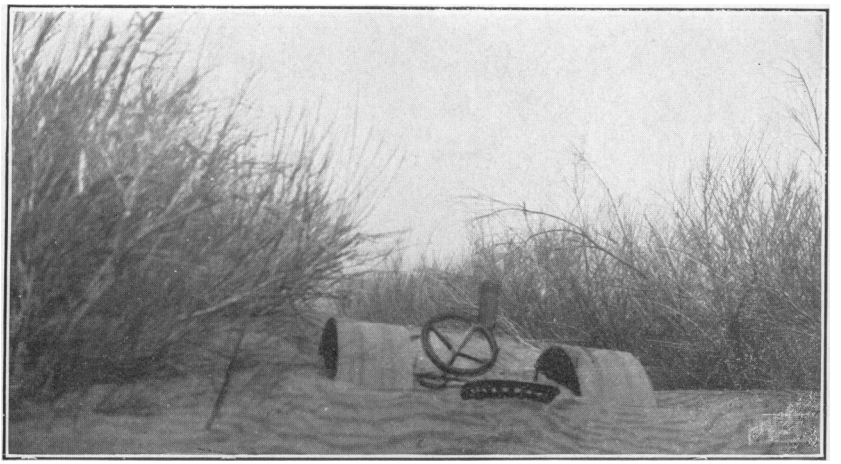

FIGURE 8.—Farm machinery almost covered by soil drifts. (Copyrighted photograph. Used by permission of copyright owners.)

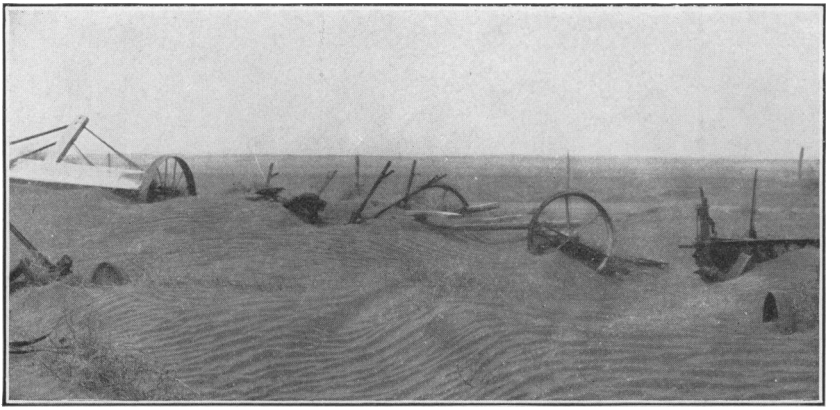

FIGURE 9.—Soil drifts around farm machinery. (Copyrighted photograph. Used by permission of copyright owners.)

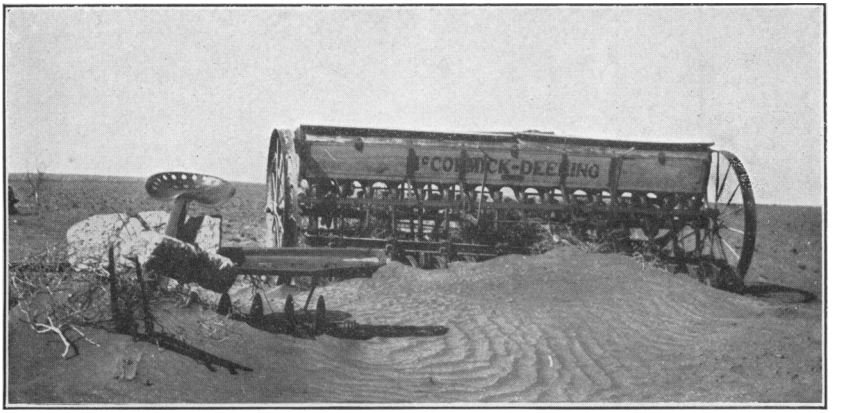

FIGURE 10.—Note soil drift over disk. (Copyrighted photograph. Used by permission of copyright owners.)

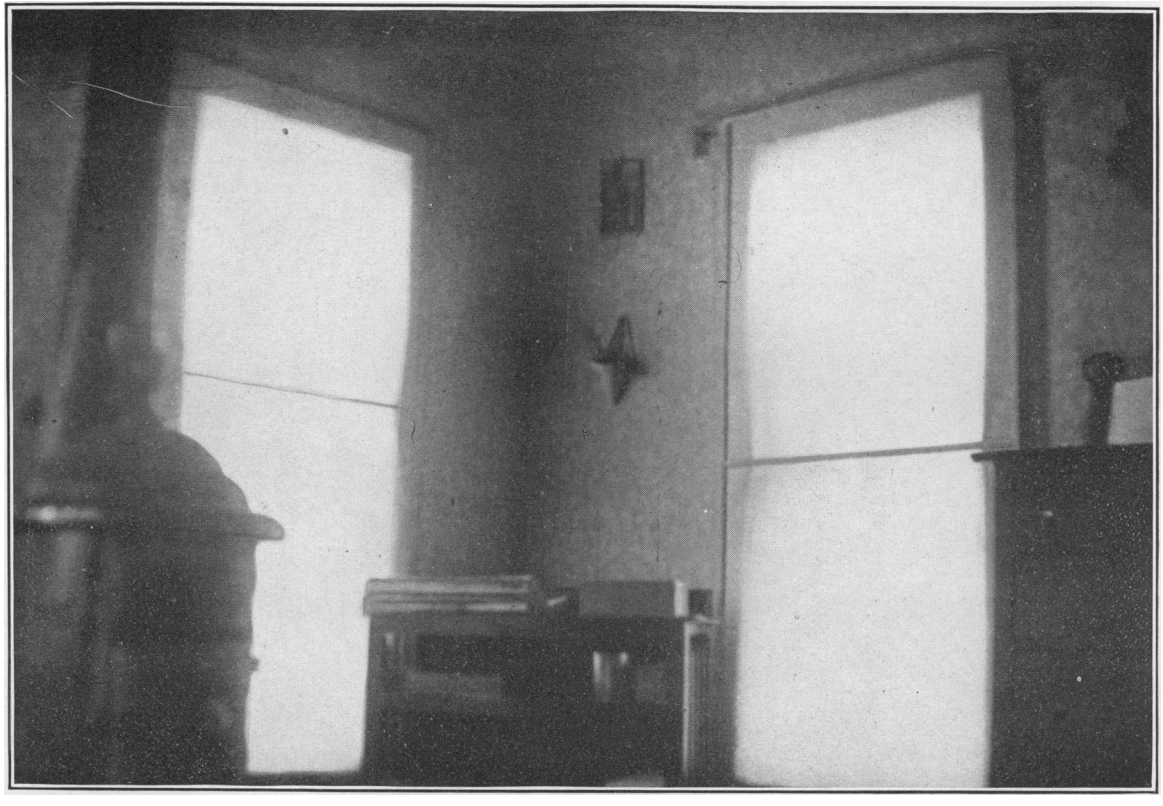

FIGURE 11.—Dustproofing of house by use of translucent glasscloth.

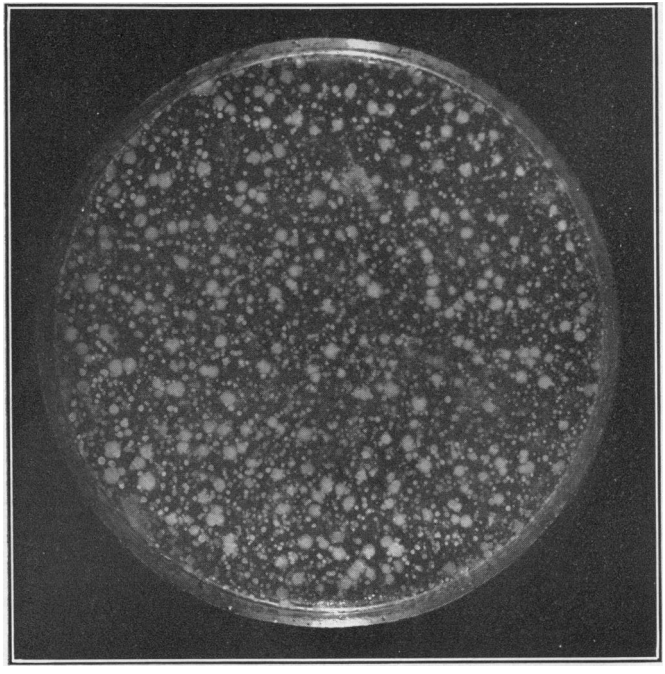

FIGURE 12.—Plate exposure of 1½ minutes at Lawrence, Kans., March 20, 1935, during dust storm.

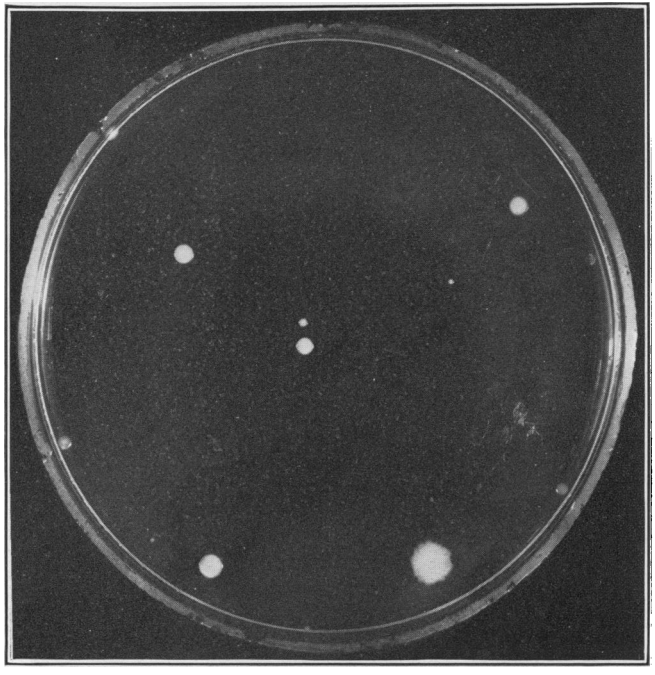

FIGURE 13.—Plate exposure of 1½ minutes at Lawrence during normal weather, March 25, 1935.

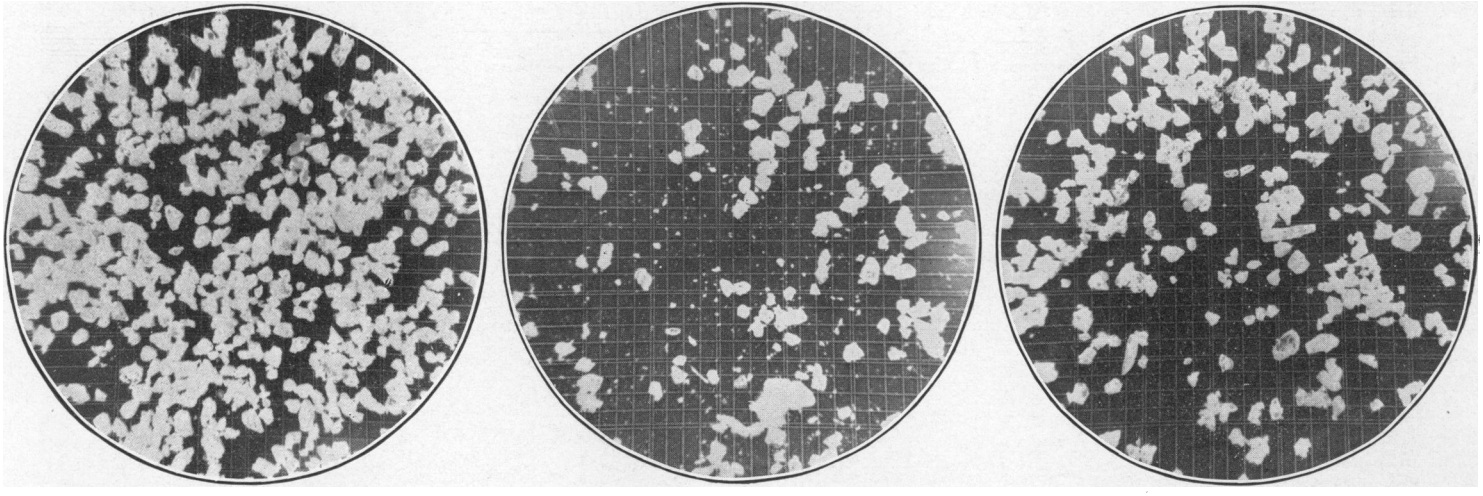

FIGURE 14.—Showing method of determination of particle size. × 50.

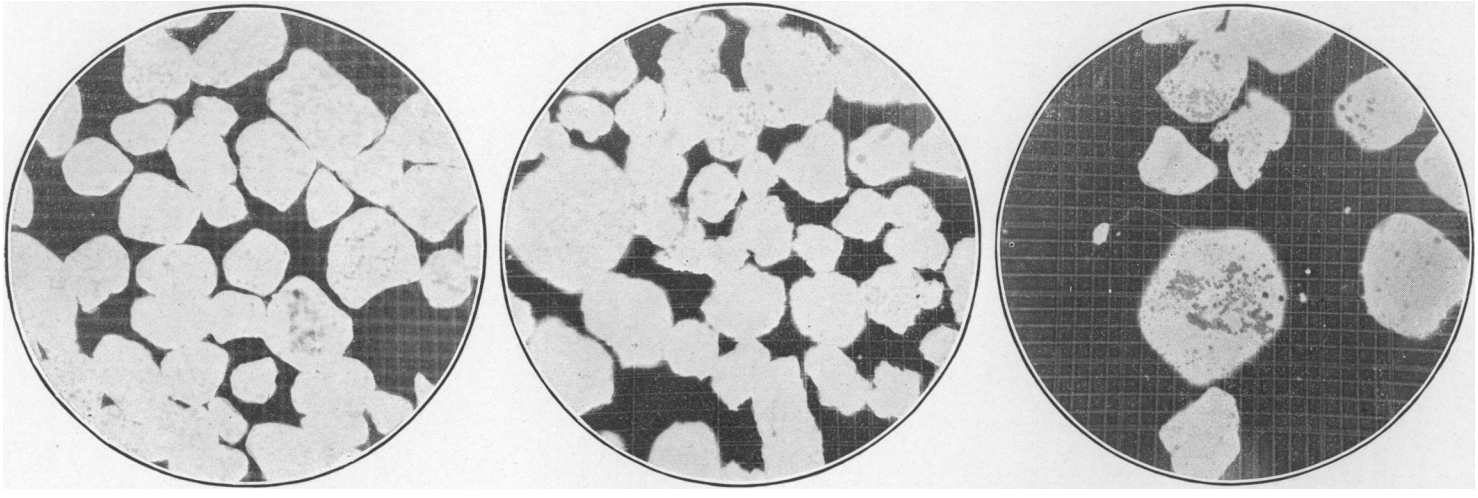

FIGURE 15.—Another photograph of dust particles as seen on haemocytometer slide in determining particle size. × 50.

Of especial interest were the temperature and relative humidity records for certain days when the dust was most dense. At Dodge City on March 15, 1935, at 7 a. m., the temperature was 56° F. and the relative humidity was 42; at 12 noon the temperature was 74° and the relative humidity was 14; and at 7 p. m. the temperature was 79° and the relative humidity was 9. At Wichita, on March 20, at 7 a. m. the temperature was 66° F., with a relative humidity of 90; at 12 noon the temperature was 65°, with a relative humidity of 12; and at 7 p. m. the temperature was 65°, with a relative humidity of 16. These data will be found in table 1.

As a result of the combination of the prolonged drought and the high winds, great damage was done to homes, livestock, and crops and human health was impaired. Authorities state that in some counties the wheat crop is a total loss, as well as some of the spring crops, such as barley and oats. There has been a tremendous loss of livestock. Pastures were so covered with dust that they were unfit for grazing; and even after the rain fell, it was considered they would not have more than 50 percent normal growth for the season.

Fields originally level now have drifts 2 to 4 feet high, Russian thistles or tumble weeds serving as wind retards. Drifts covered fences and in many places blocked highways. One drift in Edwards County was 250 feet long, with a maximum height of 5 feet, a snow fence serving as wind retard. This drift contained approximately 17,000 tons of sand and silt. Ditches along the highways have been filled to the level of the roadbed. In some areas it is said that some houses were surrounded by sand drifts. It was not unusual to see in fields along the highways, farm machinery almost covered by drifts.

The drought ended on May 10–11, when heavy rains fell throughout the State. In one county 6 inches of rain fell within a period of 3 hours. Despite the fact that there was a general rainfall, occasional dust storms were reported in the 2 weeks following. However, vegetation has now taken root, spring crops have been planted, and it is believed that the danger of dust storms during the present season is at an end.

Limited information is available as to the amount of dust that fell during the 3-month period. The following data are supplied by Dr. F. L. Duley, regional director, Soil Conservation Service, Kansas area, and G. B. Killinger, assistant soil expert. This material will be included in a future publication by Dr. Duley and Mr. Killinger.

Jewell County has had a drought for several years. In 1934 the precipitation was only 13.75 inches, whereas the normal rainfall would have been approximately 24.5 for the same period. During the first 4 months of 1935 the precipitation was only 1.77 inches, whereas it should have been approximately 5 inches. This latter 4-month period was the time during which we had our most severe dust storms.

Some measurements on the amount of silt carried by the wind during certain dust storms were recorded as follows:

March 15: Sample collected in shallow bake pan in yard measured equivalent to 4,145 pounds per acre.

March 26: Several small bake pans half full of distilled water on top of three-story hotel showed an average of 2,234 pounds per acre. Soil taken from Government rain gages in area showed an average of 2,000 pounds of soil deposited per acre for one storm.

April 16: Silt collected on hotel in small pan part full of distilled water was equivalent to 913 pounds per acre.

April 22: Pans on hotel had equivalent to 262 pounds per acre.

The total deposit of dust during these five storms was 4.7 tons per acre. There were several other dust storms for which we have no measurements.

The preceding measurements were all made in pans or rain gages and should be fairly representative of the amount of silt carried and deposited by the wind.

Measurements were made of soil deposited on a Russian thistle field when wind movements did not carry the material away. This field was located near cultivated land which was losing soil at a very rapid rate. Three 4-foot square areas were measured and weighed from this field, averaging 74.6 tons of soil deposited per acre.

A sunflower field gained 7.2 tons of soil per acre.

A bluestem pasture gained 5.4 tons of soil per acre.

A forested area gained 14.5 tons of soil per acre.

These latter measurements are probably mostly of soil moved locally, although some of the material was undoubtedly transported for some distance.

Naturally we were interested in the bacterial and chemical content of the dust. Two of us (Brown and Laybourn) made trips into the dust area and exposed agar plates to secure an index of the number of micro-organisms present in the air during dust storms. Dust samples were collected in sterile bottles. One series of plate exposures was made by Cassandra Ritter, bacteriologist, division of sanitation of the State board of health, at Lawrence, on March 20. Other plate exposures were made and dust samples collected by certain county health officers in western Kansas.

In determining the number of bacteria present in the dust carried by the storm, Difco "Standards Method Agar" was used; incubation was for 48 hours at 37° C., and the time of exposure of plates was from 5 to 15 seconds, depending on the severity of the storm. Final calculations were based on the number of organisms impinging on an area of 1 square foot per minute and the results obtained were as follows:

Date	Number of organisms per square foot per minute	County	Location
1935			
Mar. 30	31,000	Douglas	Lawrence.
Apr. 30	89,000	Seward	15 miles northwest of Liberal.
May 2	78,000	Ellis	Hays.
May 8	46,000	Finney	Garden City.
Do	460,000	Ford	Dodge City.
May 10	21,000	Sherman	Goodland.
Do	120,000	Norton	Norton.
Do	130,000	Hamilton	Syracuse.

At the time when the plates were exposed near Liberal on April 30, infusion agar, blood agar, eosin-methylene blue agar, and MacConkey's agar plates were also exposed. Counts were somewhat higher on the infusion and blood agar plates than on the "Standard Methods Agar", but no pathogenic organisms were found on these plates. No organisms of the *coli* group were found on the eosin-methylene blue agar or MacConkey's agar plates.

The predominating bacteria observed on plates exposed during dust storms were spore-forming soil types. Molds were almost as numerous as bacteria, and some yeasts were also observed.

The bacterial content per gram of dust was made on representative samples collected from accumulations and drifts in various parts of the dust area. Semiquantitative determinations of the number of *coli* organisms per gram of dust were also made. In making these determinations, one gram of dust was added to 999 cc of sterile water and thoroughly agitated. Additional dilutions were made and plated, using "Standard Methods Agar", and incubated at 37° C. for 48 hours. The bacterial content per gram of dust sample and the macroscopic appearance of the sample and the place of collection are given in table 2.

TABLE 2.—*Bacterial content per gram of dust*

Date	Number of bacteria per gram of dust	Appearance of sample	County	Location
1935				
Apr. 30	170,000	Fine sand	Seward	15 miles north of Liberal.
Do	220,000	do	Meade	4 miles north of Fowler.
Do	710,000	Fine dust	Seward	Outside window sill, Warren Hotel, Liberal.
Do	760,000	do	do	Floor sweepings, Liberal High School.
Do	410,000	Earthy	do	Lister row, 23 miles northeast of Liberal.
May 2	600,000	Medium fine earth and sand.	Ellis	Hays, north city limits.
Do	170,000	Fine dust and organic debris.	do	Hays, west city limits.
May 7	220,000	Fine dust	Norton	Norton.
May 8	600,000	Medium fine dust	Finney	Garden City, edge of town.
Do	620,000	Fine dust	do	Garden City, in town.
Do	500,000	do	Ford	Dodge City, Main Street.
Do	630,000	do	do	Dodge City, top of First National Bank.
Do	850,000	do	Grant	Ulysses, inside garage.
Do	200,000	do	do	Ulysses, east of town.
May 10	290,000	do	Norton	Norton.
Do	280,000	do	Hamilton	Syracuse, third floor, east side.
Do	310,000	do	do	Syracuse, first floor, west window.
Do	240,000	do	Sherman	Goodland.
Do	310,000	do	do	Do.

Coli determinations were made by adding portions of the 1:1,000 dilutions of dust samples to Durham fermentation tubes containing lactose broth. The usual sanitary water analyses set-up was employed, which included five 10-cc portions, two 1-cc portions, and one 0.1-cc portion. All lactose fermentation tubes showed vigorous gas

production within 48 hours, and transfers were made to eosin-methylene blue agar and Endo's medium. Characteristic organisms of the *coli* group were obtained from only 1 sample of the 19 tested. This sample was collected at Goodland, in Sherman County, and was found to contain not less than 20 *coli* organisms per gram of dust. The majority of the lactose fermentors present in the fermentation tubes were spore fermentors of either the *sporogenes* or *mesentericus* types.

In the determination at Lawrence, "The colonies on the plates appeared very similar to those formed by soil organisms, some of which will appear on plates made from raw waters. This was borne out by a microscopical examination of a number of colonies. Of 11 colonies examined, all but 2 had formed spores in 24 hours; they were all rather large bacillus forms, and most of them were Gram-positive. No coccus forms were found, either in that or later microscopical examinations. This strongly indicated that the bacteria surviving in the dust were resistant soil types."[1]

PHYSIOLOGICAL RESPONSE TO INHALATION OF SILICEOUS DUST

The role of siliceous dusts in production of silicosis is well known. According to Bloomfield and Greenburg, the results of investigations during the last 10 years have led to formulation of the concept that, so far as the fibrosis-producing qualities are concerned, dangerous dusts may be divided into three groups: (*a*) Those completely composed of silica in the form of silicates (that is, silica in the combined state, such as pure asbestos); (*b*) those containing silica in the crystalline form (known as quartz); and (*c*) those containing free silica in a form other than quartz (such as diatomaceous earth). The physiological harmfulness of a dust depends partly on its quartz content.

With regard to harmfulness of a given dust, three factors are of prime importance—the amount suspended in the air, the duration of exposure, and the particle size. As to size, it is now generally agreed that, in the case of quartz-containing dusts, the dangerous particles are usually between one-half to 5 microns in diameter and are practically always less than 10 microns.

In the investigations made by the Public Health Service into the hazards of granite cutting with a dust containing approximately 35 percent quartz, it was concluded that exposure even for considerable periods of time to less than about 10 million particles of dust per cubic foot of air was relatively safe, whereas exposure to concentrations of more than 20 million particles per cubic foot was hazardous. With a dust containing 85 to 90 percent of quartz, a concentration of over 6 to 8 million particles per cubic foot of air is regarded as hazardous.

[1] Ritter: Pub. Health Rep., May 3, 1935, p. 623.

Collis and Yule have studied the mortality experience of an occupational group exposed to silica dust compared with that of the general population and an occupational group exposed to dust not containing silica. Their conclusion is that silica is such a body poison as is lead. Although it affects chiefly the respiratory organs, it also impairs the circulatory system, the nervous system, the digestive organs, and the kidneys and liver, so that should the victim escape death through some respiratory disease, he is more than ordinarily liable to diseases of the other organs mentioned. The authors further state that the silica dust hazard is probably the most widespread and insidious of all hazards in the environment of mankind.

REPORT OF LABORATORY FINDINGS

The six samples of dust submitted to the laboratory were subjected to both physical and chemical examination. The results are tabulated in table 3.

The moisture content was determined by drying at 103° C. The loss on ignition represents organic matter and more firmly bound water. Samples of the dust were fused with a fusion mixture of equal parts of sodium and potassium carbonates to bring the silica and silicates into solution. Upon acidifying, the silica was precipitated and was weighed as such after appropriate dehydration. The metal oxides were precipitated in the filtrate with ammonia, filtered off, ignited, and weighed. Calcium was precipitated as the oxalate in the filtrate from this treatment.

TABLE 3.—*Chemical analyses of dust samples and determination of particle size*

Item of analysis	Sample no. 1	2	3	4	5	6
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Moisture	1.9	2.1	2.0	0.03	1.5	0.03
Loss on ignition	6.8	7.4	7.3	.7	8.5	1.5
Silica	72.8	73.6	73.5	92.9	66.9	88.7
Metal oxides	14.8	13.8	15.4	[1] 5.2	15.9	[1] 8.2
Calcium oxide	1.6	1.2	1.3	.2	1.0	.3
Undetermined	2.1	1.9	.5	.97	6.2	1.27
Total	100.0	100.0	100.0	100.99	100.0	100.0
	Particle size (microns)					
Average	38	26	44	185	123	330
Maximum	70	80	90	320	460	770
Minimum	16	2	16	100	80	120

[1] Mostly Al_2O; others were mostly Fe_2O_3.

Locations from which dust samples were taken:

1. Window ledge, Warren Hotel, Liberal, May 10, 1935. Fine dust, medium brown.
2. Ness City sidewalk sweepings, 8:30 a.m., May 10, 1935. Fine dust, medium gray brown.
3. Window ledge, Ness City Hotel, May 10, 1935. Fine dust, medium gray brown.
4. 8 miles north of Liberal, 10:20 a. m., May 11, 1935. Fine sand, medium brown.
5. 8 miles east of Dodge City, 1:30 p. m., May 11, 1935. Earthy appearance, dark brown.
6. 4½ miles east of Lewis, pile on snow fence, 2:30 p. m., May 11, 1935. Medium coarse sand, medium gray brown.

The particle size was determined as follows: The dust sample was thoroughly mixed and a portion dusted as evenly as possible on a haemocytometer slide, which was placed on the stage of a microscope under the low power lens. The microscope was fitted with a metal cylinder surrounding the upright tube and extending several inches above it. It was attached in such a manner as to be lightproof. The top of the metal cylinder was covered with a piece of plain window glass and a piece of frosted glass through which the image of the dust could be examined. After proper adjustment of the sample and microscope, the room was darkened, a piece of photographic printing paper was placed face-down between the two pieces of glass and the sub-stage lamp turned on for a period of 10 to 35 seconds, the time of exposure being determined by experiment. This made possible the direct photographing of shadows of the dust particles without use of films or plates and without the usual photomicrographic apparatus. From the size of the haemocytometer ruling in the finished picture, the magnification could be accurately determined. Particle size was then determined from the finished pictures by measurement with an accurate millimeter rule. This method was devised and the equipment set up by Mr. Harold Clark, a graduate student and assistant instructor in bacteriology at the University of Kansas.

It will be noted that these dust samples average much larger in particle size than the values reported for industrial dusts and outdoor dusts in the foregoing discussion. These values are somewhat corroborated by the finding of Hatch (personal communication to Mr. Boyce) that the dust drifting from the Middle West dust regions as far as Boston had an average particle size of 20 microns.

HEALTH CONDITIONS

In the past 5 months Kansas has experienced its most severe measles epidemic as regards total number of cases. From January 1 to June 8, inclusive, more than 40,000 cases of measles were reported, as compared with the previous high total of 22,464 cases for the 12 months of 1917. One hundred and forty-five deaths from measles occurred in the first 4 months of the present year. The incidence of complications of this disease was also apparently unusually high, especially otitis media.

In addition to measles, acute respiratory infections have prevailed throughout the State in unusually large numbers. The reporting of pneumonia cases, however, cannot be used as an index of the actual number of cases of that disease which actually occurred. Many health officers reported a 50 to 100 percent increase in pneumonia cases in their respective communities as compared with the same

months of 1934. Health officers also advised of a very marked increase in the other complications of the acute respiratory infections, especially sinusitis, laryngitis, pharyngitis, and bronchitis. Large numbers of cases of streptococcic sore throat were reported, and numerous cases of corneal ulcer and eye infections were seen by physicians.

A comparison of death rates for the acute respiratory infections for the first 4 months of each of the past 4 years shows the rate per 100,000 for the 45 counties in 1935 to be 99 as compared with a State rate of 70. The infant mortality rate for the present year for the 45 counties was 80.5, as compared with a rate of 62.3 for the State. These data for the 4-year period will be found in table 4.

TABLE 4.—*Comparison of death rates per 100,000 population for the State and wind-soil erosion counties (acute respiratory infections and infant mortality) for the 4-year period, 1932–35*

Death rate, acute respiratory infections			Infant mortality rate	
Year	State	W. S. E. C.	State	W. S. E. C.
1932	47	41	49.2	51.6
1933	70	73	69.7	81.3
1934	42	33	50.1	48.7
1935	70	99	62.3	80.5

Reports from the principal hospitals in the dust area indicate a very high proportion of admissions for acute respiratory infections in the first 4 months of the present year. In one hospital, 12 percent of admissions in January were for this cause, 14 percent in February, 17 percent in March, and 52 percent in April. For four of the hospitals in 1935, 233 admissions were for acute respiratory infections, with 33 deaths, as compared with 118 admissions and 15 deaths in 1933, and 115 admissions and 15 deaths in 1934. It should be remembered, however, that owing to the publicity given the so-called "dust pneumonias" more patients were sent to hospitals than in previous years. A number of patients were moribund when admitted and died within a few hours. Many cases came from a considerable distance, often during severe dust storms, and probably their resistance was further lowered by reason of the long ride and breathing the dust. Many of the hospitals furnished gauze masks to their patients, which gave them greater comfort in breathing during the storms.

No evidence has been found that any pathogenic organisms were carried by the dust, and therefore the direct cause of the increase in respiratory infections could not be attributed to this factor. The dust, however, was exceedingly irritating to the mucous membranes of the respiratory tract, and in our opinion was a definite contributory factor in the development of untold numbers of acute infections

and materially increased the number of deaths from pneumonia and other complications.

PREVENTION OF DUST INHALATION

Shortly after the beginning of the dust storms, our department issued a statement advocating the wearing of gauze masks during the storms. At the conference in Liberal, previously referred to, the State health officers of Oklahoma, Colorado, and Kansas issued a statement approving the program inaugurated by the American Red Cross, which included—

1. The hospitalization of individuals who were so seriously ill that they could not receive adequate attention at home;
2. The dustproofing of homes in the dust area; and
3. The wearing of masks by all individuals exposed to dust.

Following the conference, the Red Cross issued a call to their various chapters for dust masks, which were made of gauze or cheesecloth. According to their report, more than 17,000 masks were distributed in the next 3 or 4 weeks. In the meantime, large numbers of persons had purchased masks of commercial manufacture, ranging in price from $1 to $4. In our judgment, the light gauze masks are very satisfactory for use even in severe storms.

In our first trip through the dust area and preceding the Liberal conference, we noted a number of homes where the windows had been sealed on the outside with translucent glasscloth. We were also informed by some individuals that they had used gummed paper tape, or linen cloth with a starch paste, or even glue. We believe the most satisfactory method of dustproofing was through the use of glasscloth on the inside of the house.

The American Red Cross made a demonstration in a number of the counties of the method of dustproofing through use of glasscloth, or by calking. The Red Cross furnished the material and the KERC, the labor. The cost of dustproofing a home of 2 or 3 rooms with glasscloth, exclusive of labor, was approximately $3. The glasscloth, when used on the inside of the house, extended past the frame of the windows or doors, and the edges were then sealed to the wall with gummed masking-tape.

The general attitude of those living in this area, even when the storms were at their height, was one of optimism. All that was necessary was rainfall, which would settle the dust and allow the planting of crops.

Rain did fall; it cleaned the air. Crops have been planted and are now growing. The general health has improved, and, for the most part, families are living under normal conditions. It is hoped that dust storms, experienced almost daily for a period of 3 months will never occur again.

SUMMARY AND CONCLUSIONS

1. The dust storms which have occurred in the central west are the climax of a 4-year period of decreased rainfall, a lack of growth of vegetation, and high winds.

2. Crop and livestock losses have been large. It is believed by authorities that, although there has been much shifting of soil, the actual damage to farm lands is small, if any.

3. There is no evidence that pathogenic organisms were actually carried by the dust.

4. The dust acted as an irritant to the mucous membranes of the respiratory tract. Laboratory examinations have shown the dust to have a high silica content.

5. The effect of dust storms on the public health must be divided into "immediate" and "future" effects.

6. The "immediate" effects are shown in the increase in morbidity and mortality from the acute infections of the respiratory tract.

7. The "future" effect is unknown. Possibly over a long period of exposure or repetitions of the storms the end effects would be similar to those from exposure to mine and other industrial dusts.

8. Dustproofing of homes and the wearing of masks are essential to the comfort and welfare of individuals living in the dust area if future storms should occur.

ACKNOWLEDGMENTS

Acknowledgment is made of the courtesy of the following studios for the use of copyrighted photographs: Conard Studio, Garden City, Kans., for figures 3, 4, 5, 6, 8, and 9; Stovall Studio for figure 10.

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MILK CONTROL AND THE UNITED STATES SUPREME COURT

By JAMES A. TOBEY, LL. B., Dr. P. H., *Director of health service, the Borden Co., New York, member of the New York and United States Supreme Court Bars*

The Federal Constitution provides among other things that no State shall deprive any person of life, liberty, or property without due process of law nor deny to any person within its jurisdiction the equal protection of the laws. The Constitution also vests in the Congress of the United States exclusive power to legislate in the interests of interstate commerce.

State laws and municipal ordinances pertaining to the public health often have been attacked as violating the Federal jurisdiction over interstate commerce or as in conflict with the constitutional privileges of individual citizens outlined in the fourteenth amendment. As the final arbiter of constitutional questions the Supreme Court of the United States has ruled on numerous occasions that, while there are certain limitations on the police power of the States, the States are not deprived, by certain provisions of the Federal Constitution, of the power to make *reasonable* regulations for the protection of the public health.[1]

The question of the proper extent of State or municipal control over milk and milk products has been decided by the United States Supreme Court in several important and interesting cases. Since the beginning of the twentieth century this court has been called upon to adjudicate eight causes of action directly on the subject of the regulation of milk and dairy products, has handed down several other decisions on the economic control of milk, and has, of course, enunciated legal principles in numerous other cases which have a significant, if indirect, influence on this whole matter.

In the first case directly involving milk control, that of *Fischer* v. *St. Louis*,[2] which came before the United States Supreme Court in 1904, the constitutional issue was whether a municipal ordinance requiring permits from the municipal assembly for the establishment of dairies in the city was or was not in contravention of the fourteenth amendment to the Federal Constitution. A dairyman who had been convicted of a violation of the ordinance contended that he had been denied due process of law and the equal protection of the laws as guaranteed to him by this amendment. The supreme court of Missouri had upheld the conviction,[3] and the case was then appealed to the highest court of the land.

[1] Tobey, J. A.: Public Health Law. Williams & Wilkins. 1926. Also Tobey, J. A.: The National Government and Public Health. Johns Hopkins. 1926. Chap. V.

[2] *Fischer* v. *St. Louis* (1904), 194 U. S. 361, 48 L. Ed. 1018, 24 S. Ct. 673.

[3] 167 Mo. 654, 67 S. W. 872.

The United States Supreme Court affirmed this decision, stating that the city was shown to have the authority to adopt the ordinance and that there was no discrimination in its provisions and no abuse of the licensing power. This decision sustains the constitutionality of reasonable licensing, by the State or its political subdivisions, of persons engaged in the production and sale of dairy products.

In the following year, in the case of *Lieberman* v. *Van de Carr*,[4] the Court was confronted with a similar question, but with the difference that the jurisdiction of a municipal board of health in issuing permits for the sale of milk was before it for determination. A milk dealer had been convicted of a violation of the sanitary code of New York City, which prohibited the sale of milk in the city without a permit in writing from the board of health. Here again, the law had been upheld by the highest court of New York, the court of appeals,[5] but the aggrieved defendant felt that his constitutional rights of due process of law had been infringed.

As in the previous decision (ref. 2), the United States Supreme Court adjudged that the sanitary code was valid and sustained the authority of the city to issue or withhold permits in the honest exercise of a reasonable discretion. In this opinion Mr. Justice Day stated "That this Court will not interfere because the States have seen fit to give administrative discretion to local boards to grant or withhold licenses or permits to carry on trades or occupations, or perform acts which are properly the subject of regulation in the exercise of the reserved power of the States to protect the health and safety of its people, there can be no doubt", and he pointed out that there was nothing to show that the action of the health authorities was arbitrary or oppressive and that all milk dealers were equally affected by the provisions of the code.

The next case concerning milk control brought before this court, *St. John* v. *New York*,[6] involved a State law which defined and prohibited the adulteration of milk and set standards to be complied with by all persons selling milk. A nonproducing wholesale and retail milk dealer, while conceding the power of the State to adopt such legislation, complained that its operation worked an injustice against nonproducers and thus was unconstitutional. The New York courts, however, sustained the law,[7] which was also upheld by the United States Supreme Court.

In this decision attention was called to the fact that the ultimate purpose of the law was that wholesome milk should reach the consumer. Care in his purchases, said the Court, would allow the non-

[4] *Lieberman* v. *Van de Carr* (1905), 199 U. S. 552, 50 L. Ed. 305, 26 S. Ct. 144.
[5] 175 N. Y. 440, 67 N. E. 913, 108 Am. St. Rep. 781.
[6] *St. John* v. *New York* (1906), 201 U. S. 633, 50 L. Ed. 896, 26 S. Ct. 554, 5 Ann. Cas. 909.
[7] 178 N. Y. 617, 70 N. E. 1104.

producing vendor of milk to comply with the provisions of the law without undue hardship.

Seven years elapsed before the next case on milk control was decided by the Supreme Court, but this decision, *Adams* v. *Milwaukee*,[8] presented some important new principles. The case reached the United States Supreme Court on appeal from a decision of the Supreme Court of Wisconsin, which sustained the validity of an ordinance of the Common Council of the city of Milwaukee regulating the sale of milk. This ordinance prohibited the sale of milk in the city from outside sources unless it came from tuberculin-tested cattle, as shown by a certificate from a duly licensed veterinarian. The ordinance also empowered the commissioner of health of the city to confiscate and destroy any unwholesome milk shipped into the city.

The plaintiff, Adams, contested this ordinance on the ground that it discriminated against him in favor of producers within the city, but the Supreme Court of the United States held that, since all producers outside the city were treated alike, there was no discrimination or violation of constitutional rights. The Court said: "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." Reference was made to the prior decision in *St. John* v. *New York* (ref. 6) as a case quite in point.

With regard to the confiscation and destruction of milk shipped into the city which did not conform to the requirements of the ordinance, the Court stated that this was the only available and efficient penalty for violation of the ordinance, that such drastic action was justified under the police power, and that it was not a taking of property without due process of law within the meaning of the Federal Constitution. This case was said to come within the principle of *Lieberman* v. *Van de Carr* (ref. 4), which held that milk might be prohibited from being sold; and the Court also cited the case of *Reid* v. *Colorado*,[9] which held, inferentially, that impure milk could be prevented even from entering a city.

In 1916 the United States Supreme Court decided that a State law forbidding the sale, as ice cream, of a product not containing a certain portion of butter fat was a valid exercise of the police power of the State;[10] and in 1919 it sustained as constitutional an Ohio statute penalizing the sale of condensed milk unless made from unadulterated milk from which the cream had not been removed.[11] In the latter case the State law was held to apply to a skimmed condensed milk to which a vegetable fat had been added, even though the product was manufactured in another State and shipped

[8] *Adams* v. *Milwaukee* (1913), 228 U. S. 572, 57 L. Ed. 971, 33 S. Ct. 610.
[9] *Reid* v. *Colorado* (1902), 187 U. S. 137, 47 L. Ed. 108, 23 S. Ct. 92, 12 Am. Cr. R. 506.
[10] *Hutchinson Ice Cream Co.* v. *Iowa* (1916), 242 U. S. 153, 61 L. Ed. 217, 37 S. Ct. 28, Ann. Cas. 1917 B 643.
[11] *Hebe Co.* v. *Shaw* (1919) 248 U. S. 297, 63 L. Ed. 255, 39 S. Ct. 125.

in unopened cases into Ohio. Three justices dissented from the majority opinion of the Court, as delivered by the late Mr. Justice Holmes.

An important decision regarding the prohibition of entry, into a State, of cattle infected with a disease transmissible to man, either directly or through ingestion of contaminated milk, was handed down by the United States Supreme Court in 1933.[12] In this case an order by a State commissioner of agriculture, made pursuant to State law, required that all cattle shipped into the State should be accompanied by an official certificate showing them to be free from Bang's disease, the infecting organism of which is the cause of undulant fever in human beings. This order was sustained as not repugnant to the interstate commerce clause of the Constitution and as being an appropriate measure to safeguard the public health.

On several previous occasions the United States Supreme Court had upheld the power of a State to prevent the entry of diseased cattle (ref. 1). In *Reid* v. *Colorado* (ref. 9), for example, a State law, prohibiting the importation of any cattle into the State between April and November from south of the 36th parallel of north latitude, unless a certificate was procured from a State veterinarian showing that they were free from infections and contagious diseases and had not been exposed to such diseases within 90 days, was sustained as a constitutional exercise of the police power, regardless of any effect upon interstate commerce.

In 1934 the Supreme Court was called upon to adjudicate a State milk control law which was somewhat different in character from the others previously before the Court. This law created a State milk control board in New York, authorized it to investigate and regulate the milk industry, required it to fix minimum and maximum wholesale and retail prices for milk, and empowered it to license all milk dealers and revoke their licenses for specified causes. The law, which had been sustained by the Court of Appeals of New York,[13] was upheld by the United States Supreme Court in a 5 to 4 decision.[14]

On behalf of the majority of the Court, Mr. Justice Roberts stated that milk is not a public utility, but that the milk industry is one subject to reasonable regulation in the public interest and that it has been regulated by numerous laws, the constitutionality of which has been frequently upheld by courts of last resort. The particular law in question was considered not to be a violation of the right of due process of law. The Court said:

> The Constitution does not secure to anyone liberty to conduct his business in such fashion as to inflict injury upon the public at large, or upon any substantial

[12] *Mintz* v. *Baldwin* (1933), 289 U. S. 346, 53 S. Ct. 611, 77 L. Ed. 1245.
[13] *People* v. *Nebbia* (1933), 262 N. Y. 259, 186 N. E. 694.
[14] *Nebbia* v. *New York* (1934), 291 U. S. 502, 78 L. Ed. 940, 54 S. Ct. 505, 89 A. L. R. 1469.

group of the people. Price control, like any other form of regulation, is unconstitutional only if arbitrary, discriminatory, or demonstrably irrelevant to the policy the legislature is free to adopt, and hence an unnecessary and unwarranted interference with individual liberty.

In this noteworthy decision, attention was also directed to the findings of a legislative commission of the State that milk is an essential article of diet which must be properly safeguarded, that the dairy industry is of vast significance to the economic life of the people, that there is a huge surplus of milk, and that a satisfactory stabilization of prices for fluid milk requires the burden of surplus milk to be distributed equally among producers and distributors in the milk shed.

This same State law was upheld in another case decided later in 1934.[15] In this instance a milk dealer had assailed the orders of the milk control board, which fixed minimum retail selling prices and also the minimum prices to be paid to producers, as responsible for the economic plight of this particular dealer. The Supreme Court decided, however, that the efficiency with which the business was conducted, rather than the operation of the law, governed the economic success or failure of a concern, and pointed out that the fourteenth amendment does not protect industry against the hazards of competition.

A provision of this same State law, establishing a differential of 1 cent a quart in favor of dealers not having "well-advertised" names in their sale of milk in cities of more than a million inhabitants, was contested by a leading milk company in New York City. An application for an injunction against this provision of the act having been dismissed in a Federal statutory court, an appeal was taken to the United States Supreme Court, which decided in a comprehensive opinion that the company should be permitted to produce facts in support of its contention that the law was discriminatory.[16] The case was, therefore, remanded to the lower court to obtain these data and to come to a decision as a result of them.

The two decisions sustaining the New York Milk Control Law were virtually nullified, so far as the practical application of the law was concerned, by another opinion, delivered in 1935,[17] in which the Supreme Court held that this State law did not extend to milk purchased outside the State and sold in New York in the original container, since this is a transaction in interstate commerce. The court stated that New York had no power to project its legislation into another State, nor to prohibit the introduction within its territory of wholesome milk, whether at a high price or at a low one. Such

[15] *Hegeman Farms Corp.* v. *Baldwin* (1934), 293 U. S. 163, 55 S. Ct. 7.
[16] *Borden's Farm Products Co.* v. *Baldwin* (1934), 293 U. S. 194, 55 S. Ct. 187.
[17] *Baldwin* v. *G. A. F. Seelig, Inc.* (1935), 294 U. S. 511, 55 S. Ct. 497.

action by the State could not be regarded as sanitary regulation under the police power, nor as a procedure intended mainly to protect the public health.

SUMMARY

As the result of a number of decisions of the United States Supreme Court on the constitutionality of the control of milk and milk products by States and their political subdivisions, the following legal principles may be adduced:

The State may require licenses or permits for the sanitary production and distribution of milk and milk products and may delegate the administration of such licenses or permits to ministerial boards or officers, but the licensing power must be exercised in a reasonable manner and without discrimination.

Standards for milk and milk products, adopted by States and municipalities in the interests of the public health, form a valid exercise of the police power of the State.

Requirements by a city that all milk shipped into the city shall be produced in a sanitary manner from cattle free from diseases dangerous to the public health and that impure and unwholesome milk may be confiscated and destroyed do not violate the constitutional rights of individuals.

Prohibition, by a State of the entry of cattle suffering from diseases transmissible to man, either directly or through infected milk, is justifiable under the police power and is not an unwarranted interference with interstate commerce.

A State may adopt legislation providing for reasonable regulation of the minimum and maximum wholesale and retail prices of milk, but such regulation will not apply to milk shipped lawfully in interstate commerce.

DEATHS DURING WEEK ENDED SEPT. 14, 1935

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

	Week ended Sept. 14, 1935	Corresponding week, 1934
Data from 86 large cities of the United States:		
Total deaths	6,928	7,071
Deaths per 1,000 population, annual basis	9.7	9.9
Deaths under 1 year of age	457	508
Deaths under 1 year of age per 1,000 estimated live births	42	47
Deaths per 1,000 population, annual basis, first 37 weeks of year	11.5	11.5
Data from industrial insurance companies:		
Policies in force	67,573,738	67,263,250
Number of death claims	10,767	11,176
Death claims per 1,000 policies in force, annual rate	8.3	8.7
Death claims per 1,000 policies, first 37 weeks of year, annual rate	9.8	10.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Reports for Weeks Ended September 21, 1935, and September 22, 1934

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 21, 1935, and Sept. 22, 1934

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934
New England States:								
Maine	2		1		10	1	0	1
New Hampshire							0	0
Vermont					9		0	0
Massachusetts	4	5			6	8	3	2
Rhode Island					7		0	1
Connecticut	2	3		3	9	9	0	0
Middle Atlantic States:								
New York	29	14	[1] 8	[1] 6	72	52	17	0
New Jersey	10	4	2	6	19	11	3	1
Pennsylvania	25	26			30	74	3	0
East North Central States:								
Ohio	32	32	5	4	7	14	3	1
Indiana	53	33	14	15	12	29	2	0
Illinois	56	40	7	13	21	31	2	6
Michigan	6	5	1		23	9	1	1
Wisconsin	5	3	36	10	41	52	1	1
West North Central States:								
Minnesota	6	6	2	2	11	18	1	1
Iowa	18	6			1	5	0	1
Missouri	52	45	63	38	9	13	0	2
North Dakota	7	5	1	1	2	15	0	1
South Dakota	1					1	0	0
Nebraska	3	3			2		1	1
Kansas	5	10	1		2	5	0	0
South Atlantic States:								
Delaware	2		5		9		0	0
Maryland [2 3 4]	8	13	3	28	5	6	3	0
District of Columbia	10	10					2	0
Virginia [4]	35	34			8	6	2	1
West Virginia	43	44	32	20	5	12	1	1
North Carolina [3 4]	67	65	5	3	15	17	0	1
South Carolina [4]	17	13	161	132	2	2	0	0
Georgia [4]	34	30	0		0		0	2
Florida	15	8	1	3	5	1	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 21, 1935, and Sept. 22, 1934—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934
East South Central States:								
Kentucky	66	36	2	----	12	32	1	1
Tennessee	56	64	26	15	----	13	7	0
Alabama [4]	69	54	13	10	3	20	2	0
Mississippi [3]	29	22	----	----	----	----	0	1
West South Central States:								
Arkansas	11	9	10	2	2	----	0	0
Louisiana	32	22	8	7	9	11	1	0
Oklahoma [5]	19	7	13	28	----	1	0	0
Texas [4]	74	44	27	38	7	5	0	0
Mountain States:								
Montana	----	2	4	14	8	1	0	[1]
Idaho	2	2	1	----	----	1	0	0
Wyoming	----	1	----	----	14	----	0	0
Colorado [3]	6	5	----	----	1	16	0	1
New Mexico	8	----	2	1	----	10	0	0
Arizona	----	----	3	8	----	3	0	0
Utah [2]	----	----	----	----	2	1	0	0
Pacific States:								
Washington	----	1	----	----	6	15	2	0
Oregon	----	1	11	20	36	5	0	0
California	34	19	10	15	77	41	1	0
Total	953	746	478	442	519	569	59	29
First 38 weeks of year	21,427	23,434	105,936	51,422	698,294	671,536	4,493	1,761

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934
New England States:								
Maine	18	1	3	11	0	0	1	2
New Hampshire	5	0	1	6	0	0	0	0
Vermont	5	0	5	6	0	0	0	1
Massachusetts	132	2	55	79	0	0	1	9
Rhide Island	37	0	12	5	0	0	1	2
Connecticut	32	0	37	8	0	0	6	3
Middle Atlantic States:								
New York	198	19	126	112	0	0	39	31
New Jersey	52	4	21	39	0	0	5	13
Pennsylvania	12	6	97	122	0	0	43	58
East North Central States:								
Ohio	3	16	122	193	0	3	35	30
Indiana	3	3	53	66	1	0	16	19
Illinois	12	9	230	188	1	0	40	56
Michigan	45	20	74	76	0	0	22	15
Wisconsin	3	6	95	98	2	1	3	3
West North Central States:								
Minnesota	6	1	64	42	1	0	13	1
Iowa	3	1	61	39	2	0	7	18
Missouri	1	2	49	30	0	0	21	17
North Dakota	4	2	18	12	1	1	6	3
South Dakota	0	2	4	3	1	0	3	1
Nebraska	1	0	13	12	0	2	2	1
Kansas	2	6	48	29	14	0	12	10
South Atlantic States:								
Delaware	0	0	2	2	0	0	1	2
Maryland [2 3 4]	5	1	23	29	0	0	22	28
District of Columbia	7	0	12	8	0	0	1	5
Virginia [4]	8	1	19	47	0	0	28	43
West Virginia	2	5	61	91	0	0	20	58
North Carolina [3 4]	8	0	58	83	0	1	31	9
South Carolina [4]	0	0	8	13	0	0	18	24
Georgia [4]	1	3	----	16	0	0	28	23
Florida	0	0	7	5	0	0	8	2

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 21, 1935 and Sept. 22, 1934—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934	Week ended Sept. 21, 1935	Week ended Sept. 22, 1934
East South Central States:								
Kentucky	18	1	63	58	0	0	21	62
Tennessee	4	1	48	59	0	0	38	42
Alabama [4]	0	2	18	18	0	0	28	30
Mississippi [2]	1	1	15	19	0	0	4	7
West South Central States:								
Arkansas	3	0	5	6	0	0	6	6
Louisiana	2	0	16	13	0	0	39	15
Oklahoma [5]	0	0	8	9	0	0	26	21
Texas [4]	1	3	20	24	0	8	48	65
Mountain States:								
Montana	0	11	36	9	0	1	2	7
Idaho	0	6	17	6	0	0	4	9
Wyoming	1	2	------	4	0	0	0	0
Colorado [3]	0	2	31	25	0	1	2	5
New Mexico	1	1	2	7	0	0	18	14
Arizona	2	2	5	10	0	0	3	3
Utah [2]	0	2	21	10	0	0	1	3
Pacific States:								
Washington	0	71	23	18	4	6	3	6
Oregon	0	6	20	21	0	0	4	7
California	27	53	115	96	1	0	18	16
Total	665	274	1,841	1,882	28	24	698	805
First 38 weeks of year	7,939	5,566	186,824	154,639	5,451	3,855	12,802	15,197

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended Sept. 21, 1935, 4 cases, as follows: Maryland, 1; North Carolina, 2; Colorado, 1.
[4] Typhus fever, week ended Sept. 21, 1935, 49 cases, as follows: Maryland, 1; Virginia, 1; North Carolina, 3; South Carolina, 1; Georgia, 20; Alabama, 8; Texas, 15.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
August 1935										
Alabama	2	104	54	2,493	26	49	9	34	1	69
California	23	87	33	23	472	18	134	284	13	52
Georgia	6	67	20	757	15	37	3	32	1	192
Illinois	26	104	30	126	201	------	58	452	2	180
Kansas	4	18	2	19	25	------	3	63	2	56
Louisiana	3	61	56	900	29	11	16	26	0	74
Maine	--------	2	-------	--------	123	------	31	29	0	19
Maryland	13	14	2	6	26	3	24	53	0	75
Massachusetts	4	23	-------	1	130	2	484	175	0	15
Michigan	5	24	14	21	212	------	244	170	7	52
Minnesota	4	14	2	--------	32	------	14	141	2	72
North Dakota	1	3	29	--------	23	------	5	30	0	3
Oklahoma [1]	3	48	61	539	15	29	0	47	0	177
Oregon	4	6	28	8	239	------	2	69	5	28
South Dakota	2	11	2	1	2	------	1	41	8	10
Tennessee	13	68	25	952	21	43	21	64	0	264
Texas	1	243	101	4,993	91	63	15	141	22	299
West Virginia	11	98	165	1	41	------	19	165	1	109
Wisconsin	5	10	67	--------	328	------	19	213	3	14
Wyoming	--------	1	1	--------	45	------	0	21	4	3

[1] Exclusive of Oklahoma City and Tulsa.

August 1935

	Cases
Actinomycosis:	
Illinois	1
Anthrax:	
Massachusetts	1
South Dakota	2
Chicken pox:	
Alabama	6
California	246
Georgia	7
Illinois	101
Kansas	7
Louisiana	1
Maine	28
Maryland	9
Massachusetts	97
Michigan	90
Minnesota	40
North Dakota	6
Oklahoma [1]	3
Oregon	41
South Dakota	7
Tennessee	10
Texas	9
West Virginia	3
Wisconsin	93
Wyoming	2
Conjunctivitis:	
Georgia	5
Dengue:	
Alabama	17
Georgia	6
Texas	23
Diarrhea:	
Maryland	86
Dysentery:	
Alabama (amoebic)	6
California (amoebic)	5
California (bacillary)	23
Georgia (amoebic)	5
Georgia (bacillary)	17
Illinois (amoebic)	3
Illinois (bacillary)	18
Illinois (amoebic carriers)	40
Kansas (amoebic)	1
Louisiana (amoebic)	12
Louisiana (bacillary)	4
Maryland	35
Massachusetts (bacillary)	2
Michigan (amoebic)	4
Michigan (bacillary)	1
Minnesota (amoebic)	3
Minnesota (bacillary)	3
Oklahoma [1]	23
Tennessee (amoebic)	5
Tennessee (bacillary)	16
Texas (bacillary)	47
West Virginia	2
Epidemic encephalitis:	
Alabama	4
California	6
Illinois	10
Kansas	6
Louisiana	1
Maryland	1
Massachusetts	2
Michigan	9
Oklahoma [1]	1
Food poisoning:	
California	15
German measles:	
California	165
Illinois	40
Kansas	3
Maine	41
Maryland	18
Massachusetts	89
Michigan	37
Wisconsin	109
Glanders:	
Illinois	1

August 1935—Continued

	Cases
Hookworm disease:	
Georgia	115
Louisiana	16
Tennessee	1
Impetigo contagiosa:	
Illinois	4
Kansas	2
Maryland	19
Oklahoma [1]	5
Oregon	8
Tennessee	9
Jaundice, epidemic:	
California	2
Lead poisoning:	
Illinois	4
Massachusetts	1
Michigan	3
Mumps:	
Alabama	28
California	294
Georgia	45
Illinois	140
Kansas	62
Louisiana	2
Maine	41
Maryland	39
Massachusetts	225
Michigan	85
North Dakota	24
Oklahoma [1]	12
Oregon	87
South Dakota	29
Tennessee	27
Texas	124
West Virginia	12
Wisconsin	405
Wyoming	14
Ophthalmia neonatorum:	
Alabama	1
California	1
Illinois	8
Louisiana	1
Maryland	1
Massachusetts	77
South Dakota	1
Tennessee	2
Paratyphoid fever:	
California	4
Georgia	3
Illinois	7
Kansas	13
Louisiana	2
Maryland	2
Michigan	5
Minnesota	1
Oregon	1
Tennessee	8
Texas	19
West Virginia	50
Puerperal septicemia:	
Illinois	1
Rabies in animals:	
Alabama	62
California	50
Illinois	22
Kansas	4
Louisiana	37
Massachusetts	6
Michigan	2
Oregon	1
Relapsing fever:	
California	3
Rocky Mountain spotted fever:	
Alabama	2
Maryland	10
North Dakota	1
Oregon	1
South Dakota	2
West Virginia	4

August 1935—Continued

	Cases
Scabies:	
Oregon	3
Screw worm infection:	
Georgia	1
Septic sore throat:	
California	12
Georgia	14
Illinois	1
Kansas	6
Louisiana	7
Maryland	9
Massachusetts	7
Michigan	5
Minnesota	1
Oklahoma [1]	36
Oregon	4
Tennessee	2
Wisconsin	2
Wyoming	2
Tetanus:	
Alabama	2
California	5
Georgia	2
Illinois	9
Kansas	1
Louisiana	6
Maryland	3
Massachusetts	3
Michigan	3
Oklahoma [1]	1
Trachoma:	
California	14
Georgia	1
Illinois	51
Kansas	2
Massachusetts	3
Minnesota	73
North Dakota	2
Oklahoma [1]	3
South Dakota	1
Tennessee	35
Wisconsin	1
Trichinosis:	
California	5
Maine	1
Massachusetts	2
Tularaemia:	
California	2
Georgia	4
Illinois	3
Louisiana	2
Minnesota	7
Oregon	1
Texas	1
Wyoming	2
Typhus fever:	
Alabama	70
Georgia	80
Illinois	1
Louisiana	3
Maryland	3
Massachusetts	1
Texas	47
Undulant fever:	
Alabama	7
California	5
Georgia	9
Illinois	12
Kansas	8
Louisiana	10
Maine	5
Maryland	4
Massachusetts	2
Michigan	9
Minnesota	6
Oregon	1
South Dakota	1
Texas	1
Wisconsin	2

[1] Exclusive of Oklahoma City and Tulsa.

August 1935—Continued

Vincent's infection:	Cases
Illinois	11
Kansas	1
Maine	3
Maryland	22
Michigan	12
Oregon	6
Tennessee	5
Whooping cough:	
Alabama	60
California	483

August 1935—Continued

Whooping cough—Con.	Cases
Georgia	77
Illinois	1,146
Kansas	157
Louisiana	29
Maine	83
Maryland	120
Massachusetts	293
Michigan	1,247
Minnesota	84
North Dakota	32

August 1935—Continued

Whooping cough—Con.	Cases
Oklahoma [1]	82
Oregon	52
South Dakota	32
Tennessee	147
Texas	218
West Virginia	99
Wisconsin	846
Wyoming	30

[1] Exclusive of Oklahoma City and Tulsa.

TYPHOID FEVER IN UMATILLA COUNTY, OREG.

The State health officer of Washington has reported the removal during August of 12 cases of typhoid fever from C. C. C. Camp Mottet Creek, in Umatilla County, Oreg., to the Veterans' Administration Facility Hospital at Walla Walla, Wash.

WEEKLY REPORTS FROM CITIES

City reports for week ended Sept. 14, 1935

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria, cases	Influenza		Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	1	0	0	2	0	0	0	0	4	18
New Hampshire:											
Concord	0	------	0	0	0	0	0	1	0	0	10
Manchester	0	------	0	0	1	0	0	0	0	0	19
Nashua	0	------	--------	0	0	0	0	0	0	0	--------
Vermont:											
Barre	------	------	--------	------	------	------	------	------	------	------	--------
Burlington	0	------	0	0	0	0	0	0	0	0	8
Rutland	0	------	0	0	1	0	0	0	0	0	6
Massachusetts:											
Boston	2	------	0	11	11	18	0	4	1	7	166
Fall River	0	------	0	0	2	2	0	1	0	9	27
Springfield	0	------	0	0	1	2	0	1	0	6	28
Worcester	0	------	0	1	1	11	0	3	0	1	49
Rhode Island:											
Pawtucket	0	------	--------	0	0	0	0	0	0	0	14
Providence	1	------	0	1	3	3	0	2	0	18	53
Connecticut:											
Bridgeport	0	------	0	0	0	0	0	0	0	1	23
Hartford	1	------	0	0	1	3	0	1	1	10	27
New Haven	0	------	0	0	0	1	0	0	0	10	37
New York:											
Buffalo	2	------	0	2	4	9	0	3	4	15	114
New York	18	3	2	19	63	25	0	69	20	157	1,135
Rochester	0	------	0	1	0	3	0	0	3	4	55
Syracuse	0	------	0	12	0	2	0	2	0	10	39
New Jersey:											
Camden	0	2	1	0	1	1	0	1	0	5	28
Newark	3	1	0	0	1	7	0	14	0	30	90
Trenton	0	------	0	0	0	3	0	1	0	0	31
Pennsylvania:											
Philadelphia	4	1	0	5	13	16	0	14	9	86	360
Pittsburgh	2	------	0	1	14	9	0	10	0	23	114
Reading	0	------	0	0	0	0	0	0	0	1	25
Scranton	0	------	--------	0	-------	0	0	-------	0	0	--------
Ohio:											
Cincinnati	2	------	1	2	4	6	0	9	2	5	106
Cleveland	1	20	0	2	15	4	0	10	3	57	184
Columbus	2	------	0	0	3	9	0	6	2	3	75
Toledo	1	------	0	1	7	7	0	0	0	14	54

City reports for week ended Sept. 14, 1935—Continued

State and city	Diphtheria, cases	Influenza		Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
		Cases	Deaths								
Indiana:											
Anderson	0	------	0	0	2	0	0	0	0	1	4
Fort Wayne	------	------	------	------	------	------	------	------	------	------	------
Indianapolis	0	------	0	0	11	6	0	0	0	19	107
Muncie	2	------	0	0	0	0	0	0	0	0	7
South Bend	1	------	0	0	0	1	0	0	3	0	------
Terre Haute	0	------	0	0	0	2	0	0	0	0	15
Illinois:											
Alton	3	------	0	0	0	1	0	0	0	0	7
Chicago	16	3	2	8	22	41	0	25	3	99	629
Elgin	0	------	0	0	2	0	0	0	0	0	12
Moline	0	------	0	0	0	0	0	0	0	1	9
Springfield	0	------	0	0	1	0	0	0	0	3	22
Michigan:											
Detroit	1	1	1	5	18	7	0	23	7	108	217
Flint	2	------	1	0	2	7	0	0	0	8	16
Grand Rapids	0	------	1	0	0	3	0	0	1	7	44
Wisconsin:											
Kenosha	0	------	0	0	0	2	0	0	0	1	8
Milwaukee	0	------	0	3	3	9	0	3	0	59	88
Racine	0	------	0	0	1	8	0	0	0	7	7
Superior	1	------	0	0	0	1	0	0	0	1	10
Minnesota:											
Duluth	0	------	0	0	1	3	0	1	0	2	17
Minneapolis	3	------	0	3	0	15	0	2	1	3	88
St. Paul	0	------	0	0	2	5	0	0	0	13	51
Iowa:											
Cedar Rapids	0	------	0	0	0	0	0	0	0	0	0
Davenport	1	------	------	0	------	0	0	------	0	0	------
Des Moines	0	------	------	0	------	7	0	------	0	0	36
Sioux City	0	------	------	0	------	4	0	------	0	1	------
Waterloo	3	------	------	0	------	2	0	------	0	0	------
Missouri:											
Kansas City	1	------	0	1	3	3	0	3	0	4	70
St. Joseph	3	------	0	0	1	2	0	1	0	1	19
St. Louis	7	------	0	2	7	8	0	0	3	3	181
North Dakota:											
Fargo	0	------	0	0	0	0	0	0	0	0	8
Grand Forks	0	------	------	1	------	0	0	------	0	0	------
Minot	0	------	0	0	0	0	0	0	0	0	0
South Dakota:											
Aberdeen	0	------	------	0	------	4	0	------	0	0	------
Nebraska:											
Omaha	9	------	0	1	4	2	0	1	0	0	41
Kansas:											
Lawrence	0	------	0	0	0	0	0	0	0	0	4
Topeka	0	------	0	0	1	2	0	0	0	5	22
Wichita	2	------	0	0	3	3	0	1	0	0	26
Delaware:											
Wilmington	0	------	0	1	0	0	0	0	0	2	21
Maryland:											
Baltimore	6	1	1	0	8	8	0	13	2	29	171
Cumberland	0	------	0	0	0	1	0	0	1	0	7
Frederick	------	------	------	------	------	------	------	------	------	------	------
District of Columbia:											
Washington	15	------	0	0	4	5	0	16	1	7	126
Virginia:											
Lynchburg	1	------	0	0	0	0	0	0	2	5	10
Norfolk	0	------	0	0	5	2	0	3	1	0	49
Richmond	0	------	0	0	3	3	0	2	2	0	38
Roanoke	1	------	0	0	0	2	0	2	2	2	13
West Virginia:											
Charleston	6	------	0	0	1	3	0	1	0	0	24
Huntington	2	------	------	0	------	4	0	------	0	0	------
Wheeling	1	------	0	0	0	2	0	1	2	0	16
North Carolina:											
Gastonia	0	------	0	0	1	0	0	0	0	0	4
Raleigh	------	------	------	------	------	------	------	------	------	------	------
Wilmington	0	------	0	0	1	1	0	0	1	1	9
Winston-Salem	0	------	0	0	0	2	0	0	0	0	15
South Carolina:											
Charleston	0	------	0	0	1	0	0	1	0	0	20
Columbia	------	------	------	------	------	------	------	------	------	------	------
Florence	0	------	0	0	1	0	0	0	0	0	10
Greenville	0	------	0	0	0	1	0	0	0	0	11

City reports for week ended Sept. 14, 1935—Continued

State and city	Diphtheria, cases	Influenza		Measles, cases	Pneumonia, deaths	Scarlet fever, cases	Smallpox, cases	Tuberculosis, deaths	Typhoid fever, cases	Whooping cough, cases	Deaths, all causes
		Cases	Deaths								
Georgia:											
Atlanta	7	5	0	0	4	2	0	5	3	1	73
Brunswick	1	------	0	1	0	0	0	0	0	0	1
Savannah	4	------	0	0	3	0	0	2	0	0	24
Florida:											
Miami	0	------	0	0	1	1	0	2	0	0	28
Tampa	0	------	0	2	0	1	0	0	0	0	23
Kentucky:											
Ashland	2	------	--------	0	-------	0	0	-------	0	0	--------
Covington	0	------	0	0	0	0	0	0	1	0	9
Lexington	2	------	0	1	2	0	0	2	0	0	15
Louisville	2	------	0	0	4	8	0	2	1	5	68
Tennessee:											
Knoxville	5	------	0	0	0	0	0	1	2	0	17
Memphis	3	------	0	0	4	3	0	3	1	5	68
Nashville	3	------	0	0	3	2	0	2	2	1	35
Alabama:											
Birmingham	2	2	0	0	0	3	0	2	3	2	39
Mobile	2	------	1	0	0	0	0	0	0	0	13
Montgomery	1	------	--------	0	-------	0	0	-------	0	0	--------
Arkansas:											
Fort Smith	0	------	--------	0	-------	0	0	-------	0	0	--------
Little Rock	3	------	0	0	1	1	0	1	0	0	0
Louisiana:											
New Orleans	3	2	2	3	7	0	0	8	1	0	140
Shreveport	0	------	0	0	2	1	0	0	1	0	32
Oklahoma:											
Oklahoma City	2	4	0	0	1	0	0	1	0	4	38
Texas:											
Dallas	9	------	0	0	2	5	0	1	0	3	41
Fort Worth	4	------	0	0	1	2	0	0	0	1	27
Galveston	0	------	0	0	0	0	0	1	0	0	14
Houston	18	------	0	0	3	2	0	6	2	0	63
San Antonio	3	------	0	0	1	0	0	5	0	0	41
Montana:											
Billings	0	------	0	0	0	0	0	0	0	2	6
Great Falls	0	------	0	1	0	0	0	0	0	2	4
Helena	0	------	0	1	0	0	0	0	0	0	4
Missoula	0	------	0	0	1	2	0	0	1	0	4
Idaho:											
Boise	0	------	0	0	0	1	0	0	0	0	6
Colorado:											
Colorado Springs	0	------	0	0	1	3	0	3	0	0	12
Denver	7	------	0	2	0	3	0	3	0	5	78
Pueblo	1	------	0	0	0	5	0	1	1	2	9
New Mexico:											
Albuquerque	0	------	0	0	2	0	0	3	2	0	22
Utah:											
Salt Lake City	0	------	0	1	0	11	0	3	0	10	35
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	5
Washington:											
Seattle	0	------	0	1	3	2	0	7	2	3	76
Spokane	0	------	0	3	1	0	0	0	0	2	28
Tacoma	0	------	0	0	1	0	0	0	1	0	30
Oregon:											
Portland	0	------	0	3	3	15	0	2	0	3	79
Salem	0	1	--------	0	-------	0	0	-------	0	0	0
California:											
Los Angeles	5	5	0	6	8	13	0	17	0	6	240
Sacramento	0	------	0	0	1	3	0	0	3	1	19
San Francisco	2	------	2	11	9	12	0	7	1	17	197

City reports for week ended Sept. 14, 1935—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Maine:			
Portland	0	0	1
Massachusetts:			
Boston	0	0	88
Fall River	0	0	6
Springfield	0	0	3
Worcester	0	0	1
Rhode Island:			
Pawtucket	0	0	2
Providence	0	0	15
Connecticut:			
Bridgeport	0	0	5
Hartford	0	0	2
New Haven	0	0	1
New York:			
New York	17	6	206
Rochester	----	0	1
Syracuse	0	0	2
New Jersey:			
Camden	1	1	0
Newark	0	0	5
Pennsylvania:			
Philadelphia	2	3	13
Ohio:			
Cincinnati	0	1	0
Cleveland	0	1	1
Columbus	1	1	0
Toledo	0	0	1
Indiana:			
Indianapolis	1	0	0
Illinois:			
Chicago	3	2	4
Michigan:			
Detroit	0	0	12
Flint	1	0	3
Grand Rapids	0	0	4
Minnesota:			
Minneapolis	1	1	2
St. Paul	0	0	2
Missouri:			
St. Louis	0	0	2
Maryland:			
Baltimore	0	2	4
District of Columbia:			
Washington	2	1	9
Virginia:			
Richmond	0	0	2
West Virginia:			
Wheeling	1	0	0
Kentucky:			
Louisville	0	1	13
Tennessee:			
Nashville	4	1	1
Louisiana:			
New Orleans	0	0	1
Texas:			
Houston	0	0	1
Oregon:			
Portland	0	0	1
California:			
Los Angeles	0	0	7
San Francisco	0	0	1

Epidemic encephalitis.—Cases: New York, 1; Columbus, 1; Moline, 1; Milwaukee, 1; Kansas City, Mo., 3.
Pellagra.—Philadelphia, 1; Gastonia, 1; Charleston, S. C., 3; New Orleans, 1; Dallas, 1.
Rabies in man.—Deaths: Charleston, S. C., 1; Seattle, 1.
Typhus fever.—Cases: Wilmington, N. C., 1; Atlanta, 6; Savannah, 4; Dallas, 2; Houston, 1. Deaths: Terre Haute, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended September 7, 1935.—During the 2 weeks ended September 7, 1935, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				2			1			3
Chicken pox			2	25	44	13	48	5	19	156
Diphtheria		4	2	42	5	6	1	3		63
Dysentery				2	5					7
Erysipelas				4	5	1		1	3	14
Influenza		4			23				4	31
Lethargic encephalitis					1					1
Measles		7	396	51	85	1	7	14	38	599
Mumps		1			40	27	115	7	17	207
Paratyphoid fever	13				5				1	19
Pneumonia		1			5				6	12
Poliomyelitis	1			3	15	2		20	5	46
Scarlet fever	5	12		89	61	14	9	14	23	227
Smallpox									3	3
Trachoma									2	2
Tuberculosis	7	3	22	107	95	22	13	11	27	307
Typhoid fever	6	1	10	53	34	7	7	1	4	123
Undulant fever				1	4		2			7
Whooping cough		18	5	132	346	54	103	7	27	692

GERMANY

Diphtheria.—According to a report dated August 26, 1935, there was a serious epidemic of diphtheria in Germany. First signs of an increased prevalence of the disease appeared toward the end of 1933, and the epidemic reached its height late in 1934. The following table shows the number of cases of diphtheria reported in Germany during the last 3 years, and during the first 30 weeks of 1935.

	Cases		*Cases*
1932	69,179	1934	114,000
1933	74,559	First 30 weeks, 1935	70,000

Vital statistics—First quarter 1935.—Following are vital statistics for Germany for the first quarter of 1935:

Number of marriages	126,819	Total deaths	226,967
Number of marriages per 1,000 inhabitants	7.7	Deaths per 1,000 inhabitants	13.8
Number of live births	328,846	Deaths under 1 year of age	25,201
Number of live births per 1,000 inhabitants	20	Deaths under 1 year of age per 100 live births	7.7
Number of stillbirths	8,989		

JAMAICA

Communicable diseases—4 weeks ended September 7, 1935.—During the 4 weeks ended September 7, 1935, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	6	11	Puerperal fever	----------	3
Diphtheria	1	----------	Poliomyelitis	----------	1
Dysentery	10	4	Scarlet fever	----------	1
Erysipelas	----------	1	Tuberculosis	43	76
Leprosy	----------	3	Typhoid fever	16	66

TUNISIA

Bubonic Plague—Tunis.—According to a report dated September 15, 1935, 9 cases of bubonic plague had been reported in Tunis from June 17 to September 7, 1935. All but two of these cases occurred in the dock area. It was said that vigorous efforts were being made by the health authorities of Tunis to control the situation.

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

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for September 27, 1935, pages 1354-1368. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued October 25, 1935, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

Siam—Smudprakar.—During the week ended September 7, 1935, one case of cholera was reported at Smudprakar, Siam.

Plague

Brazil—Bahia State.—A report dated September 21, 1935, states that two cases of plague were reported in the interior of Bahia State, Brazil.

Ecuador—Guayaquil.—A report dated September 13, 1935, states that from August 6 to September 9, a total of eight cases of plague occurred in Guayaquil, Ecuador.

Hawaii Territory—Hawaii Island—Hamakua District—Paauhau sector.—On September 14, 1935, one plague-infected rat was reported in Paauhau sector, Hamakua District, Island of Hawaii, Hawaii Territory.

Smallpox

Eritrea.—During the week ended August 24, 1935, five cases of smallpox were reported in the interior of Eritrea.

Typhus fever

Egypt—Damietta.—During the week ended September 14, 1935, one case of typhus fever was reported at Damietta, Egypt.

Iraq—Baghdad.—During the week ended August 31, 1935, one case of typhus fever was reported at Baghdad, Iraq.