# Public Health Reports

*Vol. 59* • AUGUST 4, 1944 • *No. 31*

## HISTOPATHOLOGICAL CHANGES FOLLOWING ADMINISTRATION OF DDT[1] TO SEVERAL SPECIES OF ANIMALS

By ARTHUR A. NELSON, JOHN H. DRAIZE, GEOFFREY WOODARD, O. GARTH FITZHUGH, R. BLACKWELL SMITH, JR., and HERBERT O. CALVERY,[2] *Division of Pharmacology, Food and Drug Administration* [3]

Microscopic study was made of 117 animals given the new insecticide DDT by a variety of routes and in doses varying from those fatal in a few days to those causing no perceptible lesions after several months. The animals examined comprise 16 rabbits, 38 rats, 24 guinea pigs, 14 mice, 12 chicks, 6 dogs, 3 cows, 3 sheep, and 1 horse. Tissues routinely sectioned were lung, heart, liver, spleen, pancreas, stomach, intestines, kidney, adrenal, testis and, in inuncted animals and in animals with tremors, skin and voluntary muscle, respectively. Frequently examined were brain, spinal cord, bone, bone marrow, and gall bladder; other structures such as thyroid, parathyroid, peripheral nerves, lymph nodes, and urinary bladder were sectioned less frequently. The usual fixative was formalin and the usual stain hematoxylin-eosin; some animals were fixed in Orth's fluid and a few in Zenker's. Special stains were limited to Sudan IV on frozen sections and Perls' reaction for ferric iron in pigment. Control animals kept under the same conditions and examined concurrently were available in adequate numbers except for the cows and the horse.

### METHODS AND IN VIVO EFFECTS

The details of the experimental procedures and of the effects observed in vivo will be published elsewhere, therefore only a brief statement is given here. For mixing in the diets and for administration by stomach tube DDT was dissolved in corn oil, while for inunction it was made up as a 30 percent solution in an organic solvent

[1] 2,2-bis (p-chlorophenyl)-1,1,1-trichloroethane.

[2] With the technical assistance of Charlie C. Boone, Senior Medical Technician, and Helen M. Leppanen, Assistant Scientific Aid.

[3] A portion of the funds used in this investigation was supplied by a transfer recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Division of Pharmacology of the Food and Drug Administration.

which had been previously found to be physiologically inert in the quantities used. "Daily" doses by stomach tube or capsule do not include administration on Sundays. Rats on feeding experiments were started at 3 weeks of age; animals otherwise were, in general, young adults.

The outstanding in vivo effect from doses near the limit of tolerance was the production of tremors, especially in the muscles of the extremities, varying from fine to coarse, in many instances continuing for days and even weeks, and in a few intermittently present for months. These tremors were produced in rabbits, dogs, rats, mice, and cows, also in guinea pigs of another group than that reported in this paper; it would appear that with a proper dosage they could be produced in most species of animals. In the tables the symbol +++ under "tremors" refers to severe or long continued tremors, ++ refers to slight tremor, and + refers to hyperirritability without tremor; these are only a rough approximation and are an estimate from information supplied by several observers. In general, the animals discussed in this paper either died or were sacrificed when in extremis.

As a byproduct of the investigations of DDT as an insecticide, it would seem that such an agent, capable of producing relatively chronic and severe tremors, should be a useful experimental agent for the neurophysiologist.

## GROSS PATHOLOGICAL CHANGES

These were not outstanding in any of the species studied. On inuncted animals the skin showed varying amounts of scaling or hyperkeratosis, with less of roughening and brownish discoloration; these changes best seen in the rabbits were usually slight and were never more than moderate in degree. Liver damage could sometimes be suspected on gross examination from the pallor or less often darkening of the centrolobular areas. Ascites or hydrothorax was never noted. In rabbits the surfaces of a few kidneys showed slight pitting, and the surfaces of two gall bladders showed a mottled appearance, with edema in one. Pulmonary infection was noted grossly in a few animals, chiefly guinea pigs. Foci of hemorrhage in the stomach mucosa and dark brown intestinal contents were occasionally seen either separately or concurrently, most often in animals surviving but a few days. Jaundice was seen in one dog. Lessened food intake often caused slight or moderate, rarely marked, atrophy of muscles and viscera, decreased body weight, and other evidence of inanition.

## MICROSCOPIC PATHOLOGICAL CHANGES

Because of the great variations in dosage and in route of administration, the significant findings in the individual rats, rabbits, guinea pigs, mice, and dogs are given in tabular form (tables 1–5). In the

TABLE 1—*Rats*

| Path. number | Rat number | Sex | Dosage and route of administration | Duration of experiment | Tremors | Significant pathological changes [1] |
|---|---|---|---|---|---|---|
| 4021 | ------- | M | 1,500 mg/kg intraperitoneal. | 6 da----- | +++ | Moderate to marked central necrosis and slight hydropic degeneration of liver; slight focal necrosis of leg muscles. B and C neg. |
| 4023 | ------- | F | -----do----------- | ---do----- | +++ | Slight central necrosis and slight vacuolar degeneration of liver; slight necrosis and desquamation of epithelium of renal convoluted tubules; slight focal necrosis of leg muscles; slight focal ulceration of gastric mucosa. B and C neg. |
| 4084 | ------- | F | -----do----------- | ---do----- | +++ | Slight to moderate central necrosis of liver; slight focal necrosis of leg muscles; slight focal ulceration of gastric mucosa. B neg. |
| 3891 | 1 | M | 1,200 mg/kg/da inunction. | 11 da---- | +++ | Hyaline granular degeneration of epithelium of renal convoluted tubules; slight central atrophy and vacuolation of liver; slight focal necrosis of leg muscles (none in back muscles); spinal cord and sciatic nerve negative. |
| 3941 | 5 | M | 600 mg/kg/da inunction. | 35 da---- | +++ | Marked central necrosis and slight bile duct proliferation in liver; moderate hyperplastic and degenerative changes in thyroid; slight renal tubular atrophy and cast formation. B and M neg. |
| 4028 | 8 | M | 300 mg/kg/da inunction. | 56 da---- | +++ | Extensive central necrosis of liver; slight hyperkeratosis of skin; excess of hemosiderin in splenic pulp; slight excess of protein material in renal tubular lumens. B, C, M all neg. |
| 4188 | 7 | M | -----do----------- | 92 da---- | +++ | Mild subacute degeneration of liver (low-grade central necrosis, slight central hyperplasia, slight peripheral atrophy, coarse basophilic granulation); moderate hyperkeratosis and thickening of stratum spinosum of epidermis. B, C, M all neg. |
| 4189 | 9 | M | -----do----------- | ---do----- | +++ | As rat 7 plus small number of hyaline renal tubular casts. |
| 4186 | 10 | M | 150 mg/kg/da inunction. | ---do----- | ++ | As rat 7 except spinal cord not examined, and less hyperkeratosis. |
| 4187 | 11 | M | -----do----------- | ---do----- | ++ | As rat 7 except spinal cord not examined; few hyaline renal tubular casts and very few atrophic tubules. |
| 3892 | 12 | F | -----do----------- | 11 da---- | ++ | Slight atrophy and fine vacuolation of hepatic cells. B, C, M, and sciatic nerve all neg. |
| 3646 | 12133 | M | 100 mg/kg/da stomach tube. | 3 da----- | -------- | Moderate central necrosis and slight hydropic degeneration of liver; slight focal necrosis of myocardium. |
| 3659 | 12135 | F | -----do----------- | 5 da----- | -------- | Marked focal necrosis of adrenal cortices; slight hepatitis. B neg. |
| 3661 | 12131 | F | -----do----------- | ---do----- | + | Colloid depletion and epithelial desquamation in thyroid. B neg. |
| 3662 | 12134 | F | -----do----------- | ---do----- | + | Colloid depletion and epithelial desquamation in thyroid. B neg. |
| 3893 | ------- | F | 75 mg/kg/da stomach tube. | 6 da----- | ++ | Slight to moderate vacuolation of centrolobular hepatic cells. B, C, M all neg. |
| 3933 | ------- | F | -----do----------- | 20 da---- | ++ | Slight centrolobular hyperplasia of liver with moderate degree of coarse basophilic granulation and minimal necrosis. B, C, M all neg. |
| 3934 | ------- | M | -----do----------- | ---do----- | ++ | As previous rat. |
| 3935 | ------- | F | -----do----------- | ---do----- | ++ | Do. |
| 3498 | 1597 | M | 1,000 ppm in diet | 4 wks---- | | None. B neg. |
| 3786 | 1593 | M | -----do----------- | 18 wks---- | ++ | Moderate subacute degeneration of liver; moderate number of hyaline renal tubular casts; few atrophic renal tubules. |
| 4043 | 1589 | F | -----do----------- | 31 wks---- | +++ | Slight subacute degeneration of liver. B, C, M all neg. |
| 3472 | 4575 | M | 800 ppm in diet---- | 4 da----- | ++ | Small amount of hemolytic pigment in lumen of stomach; suggestive excess of mucus in small intestine and colon. M neg. |
| 3473 | 4571 | M | -----do----------- | 6 da----- | ++ | As rat 4575 except muscle not sectioned. |
| 3477 | 4572 | M | -----do----------- | 7 da----- | ++ | As rat 4575. |
| 3482 | 4574 | M | -----do----------- | ---do----- | ++ | Moderate focal necrosis of leg muscles; focal hemorrhages in small intestine, stomach, and lungs. |
| 3488 | 4577 | M | -----do----------- | 8 da----- | ++ | Hemolytic pigment in lumens of stomach and small intestine. M neg. |
| 4074 | 4568 | M | -----do----------- | 30 wks---- | +++ | Slight focal necrosis and centrolobular hyperplasia of hepatic cells; slight bile duct proliferation. M neg. |

See footnote at end of table.

TABLE 1—*Rats*—Continued

| Path. number | Rat number | Sex | Dosage and route of administration | Duration of experiment | Tremors | Significant pathological changes [1] |
|---|---|---|---|---|---|---|
| 4150 | 4570 | M | 800 ppm in diet | 32 wks. | +++ | Slight subacute degeneration of liver. |
| 3955 | 1842 | M | 500 ppm in diet | 4 da. | ++ | Slight vacuolar degeneration of liver; terminal gastric hemorrhage. B, C, M all neg. |
| 3445 | 1616 | F | do | 2 wks. | | None. |
| 4003 | 1850 | M | do | 3 wks. | ++ | None certain (died of pneumonia). B, C, M all neg. |
| 3605 | 1612 | F | do | 9 wks. | | Slight centrolobular hyperplasia and peripheral atrophy of liver; (?) slight decrease in thyroid colloid. B neg. |
| 3703 | 1619 | M | do | 13 wks. | | Slight diffuse hyperplasia of liver; (?) few renal tubular casts. |
| 3869 | 4564 | M | 400 ppm in diet | 18 wks. | | Slight central necrosis of liver; focal necrosis and hemorrhage in gastric mucosa; (?) atrophy of testis. |
| 3704 | 1600 | F | 250 ppm in diet | 14 wks. | | None. |
| 3476 | 4549 | M | 200 ppm in diet | 6 days. | | Small amount of hemolytic pigment in lumen of stomach; suggestive excess of mucus in small intestine and colon. |
| 3580 | 4533 | M | 100 ppm in diet | 4 wks. | | Focal necrosis and hemorrhage in gastric mucosa; marked erythrophagia in spleen. M neg. |

[1] B, C, and M refer to brain, spinal cord, and hind leg muscles, respectively. Further explanation is given in the text, where the degrees of tremors are also evaluated.

TABLE 2.—*Rabbits*

| Path. number | Rabbit number | Sex | Dosage and route of administration | Duration of experiment (days) | Tremors | Significant pathological changes [1] |
|---|---|---|---|---|---|---|
| 3543 | 1520 | M | 1,200 mg/kg/da inunction. | 6 | +++ | Focal necrosis, marked in leg muscles, moderate in gall bladder and stomach mucosa; slight central necrosis in liver; hyaline and fewer cellular renal tubular casts; slight focal epidermal necrosis with slight subepidermal leukocytic infiltration. |
| 3550 | 1521 | M | do | 7 | +++ | Slight to moderate central necrosis of liver; marked focal necrosis and edema of gall bladder; slight focal necrosis of epidermis and outer corium; excess hemosiderin in spleen; slight focal necrosis of back muscles (not psoas and leg muscles). B neg. |
| 3552 | 1519 | M | do | 7 | +++ | Moderate central necrosis and slight hydropic degeneration of liver; moderate focal acute nephritis; slight focal necrosis of myocardium; slight dermatitis; slight focal encephalitis. |
| 3544 | 1523 | F | 600 mg/kg/da inunction. | 6 | +++ | Moderate focal acute nephritis; slight central necrosis and vacuolar degeneration of liver; skin shows slight hyperkeratosis, moderate thickening of epidermis, and slight fibroblastic proliferation in outer corium. |
| 3555 | 1524 | M | do | 8 | +++ | Moderate central necrosis and slight hydropic degeneration of liver; slight to moderate focal nephritis; very slight focal necrosis of psoas and leg muscles; slight hyperkeratosis of skin; slight splenitis; slight hyperplasia of bone marrow; moderate focal encephalitis; moderate colloid depletion in thyroid. |
| 3585 | 1526 | M | 300 mg/kg/da inunction. | 16 | +++ | Marked central necrosis and hydropic degeneration of liver; slight focal nephritis and encephalitis; moderate myeloid hyperplasia of bone marrow; excess hemosiderin in spleen and bone marrow; slight hyperkeratosis and thickening of stratum spinosum of epidermis; moderate colloid depletion in thyroid. |

See footnote at end of table.

TABLE 2—*Rabbits*—Continued

| Path. number | Rabbit number | Sex | Dosage and route of administration | Duration of experiment (days) | Tremors | Significant pathological changes [1] |
|---|---|---|---|---|---|---|
| 3771 | 1525 | M | 300 mg/kg/da inunction. | 91 | +++ | Moderate subacute degeneration of liver; slight focal fibrosis of myocardium; slight hyperplasia of bone marrow; slight encephalitis; skin shows moderate thickening of stratum spinosum, slight hyperkeratosis and very slight mononuclear cellular infiltration in outer corium. |
| 3457 | 1491 | F | 200 mg/kg/da inunction. | 6 | ..... | Moderate central atrophy and slight vacuolar degeneration of liver; (?) moderate focal nephritis. |
| 3620 | 1530 | F | 150 mg/kg/da inunction. | 37 | ..... | Moderate central necrosis of liver; slight focal necrosis of back and leg muscles (none in psoas); slight focal nephritis; skin shows moderate hyperkeratosis, slight focal sloughing of necrotic epidermis with infiltration of subepidermal corium; (?) fatty replacement of probable necrosis of inner cortex of adrenal. B neg. |
| 3649 | 1529 | M | .....do..... | 54 | ++ | Slight focal necrosis of leg muscles; moderate hyperkeratosis of skin with very slight mononuclear infiltration in subepidermal corium; slight encephalitis. Died of pyemia secondary to abscesses of feet. |
| 3772 | 1528 | M | .....do..... | 91 | ..... | Moderate subacute degeneration of liver; very slight dermatitis. B neg. |
| 3469 | 1490 | F | 100 mg/kg/da inunction. | 8 | ..... | Slight atrophy and vacuolation of peripheral hepatic cells with slight centrolobular regeneration. |
| 3534 | 1488 | F | 50 mg/kg/da inunction. | 21 | ..... | Slight hydropic degeneration of liver. |
| 3651 | 1 | F | 200 mg/kg/da stomach tube. | 3 | ..... | Slight atrophy and fine vacuolation of hepatic cells; slight hepatitis; moderate focal necrosis in back muscles (slight in psoas and leg muscles). B neg. |
| 3648 | 3 | F | .....do..... | 3 | ..... | Died of purulent process in thorax set up by stomach tube. Part of a moderate to marked central necrosis of the liver was probably caused by the DDT. |
| 3495 | 773 | M | 260 mg single dose, tube. | 12 | ..... | None. |

[1] The significance of encephalitis and nephritis are discussed in the text. Thyroid, skin, bone marrow, and voluntary muscle were routinely sectioned and were not affected by DDT unless so stated.

TABLE 3.—*Guinea pigs*

| Path. number | Pig number | Sex | Dosage and route of administration | Duration of experiment | Tremors | Significant pathological changes [1] |
|---|---|---|---|---|---|---|
| 3966 | 2 | M | 1,200 mg/kg/da inunction. | 5 da | +++ | Slight hyperkeratosis and slight thickening of stratum spinosum of epidermis. B, C, M all neg. |
| 4002 | 4 | F | 600 mg/kg/da inunction. | 14 da | ++ | As above. Died of pneumonia. |
| 4077 | 5 | M | do | 35 da | ++ | As above. Died of pneumonia and purulent nephritis. |
| 3657 | 2034 | M | 75 mg/kg/da stomach tube. | 3 da | | Probably none. B neg. |
| 3650 | 2035 | M | do | 5 da | | Slight to moderate focal necrosis of liver. B neg. |
| 3655 | 2032 | M | do | do | | Slight fatty degeneration and central atrophy of liver. |
| 3656 | 2031 | M | do | do | | Slight atrophy and very slight fatty degeneration of liver; very slight focal nephritis; moderate colloid depletion in thyroid. |
| 3658 | 2033 | M | do | do | | Moderate acute atrophy of testis; moderate colloid depletion in thyroid; very slight focal necrosis of leg muscles. B neg. |
| 3496 | 220 | F | 1,000 ppm in diet | 7 da | | This group of 16 guinea pigs was compared with a group of 11 kept under the same conditions for approximately the same lengths of time and examined concurrently. Our other species of animals have been in excellent condition in respect to spontaneous diseases, but both groups of guinea pigs showed roughly a 50 percent incidence of chronic abscesses, plus minor inflammatory and degenerative changes. No distinct difference in incidence or severity could be made out between treated and control animals; there was a suggestion that DDT caused a minimal amount of fatty degeneration and necrosis of the liver. Brains and leg muscles negative in 4 and 8, respectively, of the treated animals. |
| 3523 | 222 | F | do | 10 da | | |
| 3567 | 221 | M | do | 3 wks | | |
| 3622 | 215 | M | do | 6 wks | | |
| 3994 | 213 | M | do | 24 wks | | |
| 4041 | 217 | F | do | 25 wks | | |
| 4042 | 219 | M | do | do | | |
| 3741 | 209 | M | 500 ppm in diet | 8 wks | | |
| 3710 | 204 | M | do | 10 wks | | |
| 3765 | 212 | M | do | 13 wks | | |
| 3781 | 207 | F | do | do | | |
| 3890 | 210 | M | do | 20 wks | | |
| 3914 | 203 | M | do | 21 wks | | |
| 3995 | 208 | F | do | 24 wks | | |
| 3996 | 211 | F | do | do | | |
| 3905 | 218 | F | 250 ppm in diet | 19 wks | | |

[1] B, C, and M refer to brain, spinal cord, and hind leg muscles respectively. Further explanation is given in the text, where the degrees of tremors are also evaluated.

TABLE 4.—*Mice*

| Path. number | Mouse number | Sex | Dosage and route of administration | Duration of experiment (days) | Tremors | Significant pathological changes [1] |
|---|---|---|---|---|---|---|
| 3667 | 10831 | F | 150 mg/kg/da stomach tube. | 5 | + | This group of 5 mice all showed similar lesions. There was slight or moderate central necrosis and vacuolation (probably hydropic) of the liver, with slight peripheral atrophy; the vacuolation varied from very fine to ballooning of the cells. There was also slight focal necrosis in and hemorrhage from the stomach mucosa. Brains of 4 and leg muscles of 2 of these mice were sectioned and were negative. |
| 3666 | 10832 | F | do | 4 | ++ | |
| 3663 | 10835 | F | do | 5 | ++ | |
| 3664 | 10834 | F | do | 5 | ++ | |
| 3665 | 10833 | F | do | 5 | ++ | |
| 3975 | | M | 50 mg/kg/da stomach tube. | 4 | +++ | Slight focal necrosis in and hemorrhage from gastric mucosa. Thyroid negative. B, C, M all neg. |
| 3989 | | M | 50–70 mg/kg/da stomach tube. | 7 | +++ | Slight central hyperplasia and very slight necrosis of liver. B, C, M all neg. |
| 3990 | | M | do | 7 | +++ | As previous mouse, except very slight focal necrosis of leg muscles. |
| 3993 | | M | 50–80 mg/kg/da stomach tube. | 8 | +++ | Slight central necrosis of liver, plus slight central hyperplasia and peripheral atrophy; very slight focal necrosis of leg muscles. B and C neg. |
| 4017 | | M | do | 12 | +++ | Slight irregular hyperplasia and very slight central necrosis of liver. B, C, M all neg. |
| 4018 | | M | do | 12 | ++ | Slight central hyperplasia and peripheral atrophy of liver. B, C, M all neg. |
| 3478 | 18 | F | 500 ppm in diet | 3 | | None. B neg. |
| 3479 | 19 | F | do | 3 | | None. B and thyroid neg. |
| 3531 | 30 | M | 125 ppm in diet | 7 | | Hemolytic pigment in colon. B neg. |

[1] B, C, and M refer to brain, spinal cord, and hind leg muscles respectively. Further explanation is given in the text, where the degrees of tremors are also evaluated.

TABLE 5.—*Dogs*

| Path. number | Dog number | Sex | Dosage and route of administration | Duration of experiments | Tremors | Significant pathological changes [1] |
|---|---|---|---|---|---|---|
| 3881 | 82-200 | F | 120 mg/kg/da orally, in corn oil. | 13 da | ---- | Jaundice; low grade central necrosis of liver; plugging of bile canaliculi; Kupffer cell hyperplasia and erythrophagia; slight fragmentation and necrosis of gluteal muscle fibers; moderate colloid depletion in thyroid; slight splenitis. B and C neg. |
| 3584 | 163 | M | 100 mg/kg/da orally, in corn oil. | 4 wks | +++ | Moderate central necrosis (low grade) of liver; slight colloid depletion in thyroid. B and M neg. |
| 3604 | 164 | M | do | 6 wks | +++ | Too much post-mortem autolysis to section viscera. Intercostal, abdominal, and hind leg muscles show no necrosis. |
| 4233 | 161 | F | 50 mg/kg/da orally, in corn oil. | 7 mos | ++ | Liver shows moderate fatty degeneration, low grade central necrosis, marked excess o sinusoidal macrophages filled with hemosiderin, and slight portal fibrosis; moderate hemosiderosis of spleen and kidney; marked excess of fat in renal tubular epithelium. B and C neg. |
| 3468 | 162 | F | 10 mg/kg/da orally, in corn oil. | 3 da | ---- | Died of pneumonia; no lesions attributable to DDT. |
| 3541 | 165 | F | do | 20 da | ---- | As previous dog. B neg. |

[1] B, C, and M refer to brain, spinal cord, and hind leg muscles respectively. Further explanation is given in the text, where the degrees of tremors are also evaluated.

ADDENDUM: At the time of correcting proof, 6 additional dogs succumbing to DDT given in corn oil in capsules at 50 to 80 mg/kg/day for 22 to 38 days had been studied. All 6 dogs showed moderate to severe necrosis of the liver. Among other lesions, 5 dogs showed hemorrhages (subcutaneous, subendocardial, mucosal, etc.) and 3 dogs were jaundiced.

tables the animals are arranged in order of decreasing dosage and, within each level, in order of increasing length of experimental period. It should be borne in mind, however, that about four times as much DDT is required to produce a given effect by inunction as by oral administration. The chicks and the large domestic animals received more uniform treatment; findings will be summarized in the text.

The most characteristic and most frequent lesion produced by the higher dosage levels of DDT, whether the animal lived for 1 week or for several months, was a moderate degree of liver damage taking any of several forms but most commonly either that of a centrolobular necrosis or what we have called subacute degeneration. The latter tended to occur with the longer times of survival and included a factor of repair or adaptation; the centrolobular areas showed varying mixtures of a lytic type of necrosis with hypertrophy of most of the surviving cells, while the peripheries of the lobules were slightly atrophic and the intermediate zones often showed vacuolated and sometimes ballooned cells, and in a few instances cells with several nuclei. The process was rather reminiscent of human subacute degeneration of the liver, but was not as extensive or as intense. Its exact counterpart has not been seen in any other series of experimental animals studied by us. In three or four livers many of the hepatic cells showed a peculiar light and semihyaline staining of all the cytoplasm except a dark thick rim. It has been learned from Dr. R. D. Lillie of the

National Institute of Health that this process is similar to the early stages of a hyaline change in the liver cells to be reported by him, and seen in animals given DDT.

Focal necrosis of small segments of voluntary muscle was often seen with the higher dosage levels of DDT, but only rarely was more than a small percentage of the area of a given section involved. Roughly 20 percent of such animals were affected, but an accurate figure is difficult to obtain, as it would vary with the amount of muscle sectioned. In rabbits the psoas, sacrospinalis, and thigh muscles were usually sectioned; in other animals a few back muscles were sectioned in addition to the thigh muscles. As a rule the thigh muscles showed more damage than the others.

Damage to the skin in inuncted animals was essentially limited to hyperkeratosis and thickening of the stratum spinosum of slight or moderate degree, with no or very little cellular infiltration in the underlying corium. The rabbits on the higher dosage levels had in addition a slight focal epidermal necrosis with slight cellular infiltration in the subjacent corium. The solvent used for DDT inunction had been previously applied to rabbit skins and had not produced these changes.

Thyroids of rabbits and dogs were sectioned routinely. Those of the rabbits were negative except that two showed a moderate depletion of stainable colloid in the follicles. Two dogs showed about one-third and one-tenth of the follicles containing very little colloid, with the remainder essentially normal; there was also epithelial desquamation in the depleted follicles. Thyroids of four rats were examined; that of rat 12131 showed moderate colloid depletion and marked epithelial desquamation, that of rat 12134 showed these in marked and slight degree, respectively, while that of rat 5 showed colloid depletion, epithelial desquamation, and epithelial hyperplasia all present in moderate degree; rat 1612 showed questionable change. Thyroids of two guinea pigs were sectioned and both of these showed moderate depletion of colloid, while those of two mice were negative.

The aforementioned changes in the liver, voluntary muscles, thyroid, and skin have been consistent throughout the species of animals studied, with the exceptions and limitations that chicks show little or no liver damage even though physiological effects were severe, that only three species were inuncted, that the number of large domestic animals examined was small, and that thyroids were not routinely examined. In addition to these lesions the rabbits showed certain changes peculiar to them. A focal granulomatous encephalitis of mild to moderate degree and histologically identical with the "spontaneous" type caused by *Encephalitozoon cuniculi* was seen in 5 of the 9 rabbit brains sectioned. This incidence contrasts with that of 4 of 55 sectioned brains from rabbits either untreated or treated with

substances other than the above. Similarly the incidence of slight or moderate degrees of a focal nephritis similar to the "spontaneous" type produced by the same organism was much greater than in control rabbits. Parenthetically, the renal lesions from toxic agents are of two general types in our rabbits, either a diffuse and chiefly tubular damage or a focal tubular and interstitial lesion similar histologically to the "spontaneous" parasitic type. Since the lesions from DDT belong in the latter group, only a distinctly greater incidence or severity than in control animals would cause DDT to be held responsible with any certainty. Whether DDT is directly responsible or whether it allows the activation of a latent parasitic or other type of involvement is an open question. The third lesion seen in rabbits and not in other species was a focal necrosis of the gall bladder in 2 of the 3 rabbits on the highest dosage level.

Hemolytic pigment in the gastrointestinal tract, with or without (some undoubtedly being missed in sectioning) the presence of small areas of necrosis and hemorrhage in the gastric mucosa, was inconstantly present, most often in rats and mice and less often in rabbits. It was more common in animals found dead than in those sacrificed, and usually appeared to be a terminal phenomenon. Terminal subendocardial hemorrhages of questionable significance were seen in some of the large domestic animals. Except in rabbits, renal lesions were infrequent. One of three rats given a massive intraperitoneal dose showed slight necrosis and desquamation of the convoluted tubular epithelium. Five other rats showed small or moderate numbers of hyaline tubular casts and small or very small numbers of atrophic tubules. The mouse kidneys were negative, as were those of the large domestic animals and the chicks. Guinea pig kidneys often showed minor changes, but so did their controls, as is explained in the table. Dog 161 showed a marked excess of fat in the distal looped and other renal tubules and a moderate fatty degeneration of the liver, but there was a strong factor of inanition in this instance. Rat 12133 and rabbits 1519 and 1525 showed slight focal myocardial necrosis or (1525) fibrosis. The only adrenals involved were those of rat 12135 and rabbit 1530. Only one instance of splenitis was noted; this was slight in degree, in a rabbit. One instance of splenic erythrophagia was noted, in a rat. Testicular atrophies were infrequent and with the factor of inanition eliminated it would appear that DDT does not affect this organ. Excessive amounts of hemosiderin in the spleen, bone marrow, or liver were noted in only a very few animals; these included rabbits 1521 and 1526, rat 8, and dog 82–200. The sheep spleens contained very little hemosiderin, while those of 2 of the 3 cows and of the horse contained moderate amounts; however, there were no controls for the cows and horse. Incidentally, the kidneys and livers of the large domestic animals all contained negligible

amounts of hemosiderin. Bone marrow was routinely sectioned in the rabbits and dogs; for the smaller animals the tibia, femur, and accompanying hind leg muscles were sectioned together, so that whenever leg muscles are mentioned for these animals it should be understood that the bones and bone marrow were also sectioned. Since the latter rarely, if ever, showed any changes attributable to DDT, they are not mentioned in the tables. The two slight and one moderate hyperplasia of the rabbit marrow which are mentioned are of uncertain significance, as any group of rabbits of this size is somewhat variable in its marrow composition, more so at least than most of the other animals studied. No pancreatic lesions were seen.

In view of the severe muscular tremors following large doses of DDT, a special effort was made to get brains and spinal cords from such animals immediately after death in order to determine possible changes in the nerve cells or elsewhere. Controls for each species were given concurrent similar treatment. Over 40 spinal cords, with 20 controls, and over 60 brains were studied; each of the 9 species of animals studied was included in this group except rabbits, which have already been discussed. Most of the various animals showing tremors are included; the tremors had been present for a few days to a few weeks, and even intermittently for 3 months. Most of the spinal cords and about half of the brains had been put into formalin or Orth's fluid within a half hour after sacrificing the animal. Four levels of rat, guinea pig, and mouse brains were sectioned—medulla, pons and cerebellum, midbrain, and cerebral hemisphere through the infundibulum. More sections were taken from the brains of the larger animals. In chicks the sections included medulla, cerebellum, midbrain, optic lobes, and cerebral hemisphere through the infundibulum. Usually three or four levels of spinal cord were sectioned, with slight emphasis on the lumbar region. Nowhere could any distinct difference between test and control animals be seen. There were occasional suggestions that an edema was present, and there were occasional vague peculiarities of staining of the nerve cells that could not be listed as a diagnostic entity, but there was never distinct damage to neurons, and never gliosis or inflammatory cellular infiltration. The only exceptions, all nonsignificant, are that 1 cow, 2 of 3 test sheep, and 1 of 2 control sheep showed lymphocytic cuffing around a very few blood vessels in the white substance of the brain, while 1 test and 1 control guinea pig showed slight granulomatous encephalitis somewhat similar to that in the rabbits, and 1 mouse showed a slight lymphocytic choriomeningitis. Slight cellular infiltration of the nervous tissue adjacent to the perivascular cuffing occurred in one of the test sheep. Large peripheral nerves were sectioned for 2 rats, 3 sheep, and 1 cow and were all negative.

Lesions from inanition seen in these animals have not been included with those specifically caused by DDT. Paired feeding would be necessary for an absolute differentiation. Nevertheless, it is felt that on the basis of previous experience with animals in different stages of malnutrition the two types of lesions can be satisfactorily differentiated. Changes from malnutrition (inanition) in this series were most often not apparent histologically, and in the remaining instances were most often slight and rarely marked. They were somewhat more evident on gross examination.

### CHICKENS

Twelve young chickens were examined. Beginning at 3 weeks of age they had been fed 500 or 1,000 p. p. m. of DDT in the diet for 6 to10 days (one each for 4 and 12 days). In general the chicks were hyperirritable and a few had gross tremors; all died, or were sacrificed when they appeared near death. Microscopic lesions were suprisingly infrequent; 2 chicks showed minimal focal necrosis of leg muscle fibers and 2 others showed a slight vacuolation of the liver cells. Brain and spinal cord were examined in 10 of the 12 chicks and all were normal. Four of the 6 animals surviving an experimental period of 9 to 12 days showed slight or minimal fibrotic changes in the bone of the tibia and femur, but this was attributed to the reduced dietary intake as it has been seen in other groups of chicks under such a circumstance.

### LARGE DOMESTIC ANIMALS

The treatment of this group was conducted by Dr. Orr of the Bureau of Entomology and Plant Quarantine and the necropsies were done by Dr. Mott of the Bureau of Animal Industry of the Department of Agriculture. Three cows, 3 sheep, and 1 horse received 100 to 200 mg./kg./day of DDT for 3 weeks (1 week for 1 cow and 1 sheep) either mixed with the feed or in capsules when the appetite became decreased, as was usually the case. Two of the 3 cows developed slow tremors or shaking, especially in the hind legs and neck; none of the other animals of this group developed tremors. Dr. H. R. Seibold of the Bureau of Animal Industry assisted in interpreting the microscopic sections.

Lesions caused by DDT in this group were relatively slight, probably because of poor absorption of dry DDT as compared with that dissolved in corn oil. The cow showing the most marked tremors had been given 200 mg./kg./day for a week; this animal had a slight fatty degeneration of the liver, an atrophic spleen, terminal subendocardial hemorrhages, and a minimal focal necrosis of voluntary muscles. One sheep had a slight central necrosis of the liver, and a low-grade pneumonic consolidation in one lung lobe. The cow with

the less marked tremors had very slight focal necrosis of the liver, while the third had terminal subendocardial hemorrhages and a slightly atrophic spleen. The splenic atrophy is probably an indirect effect, from reduced dietary intake. No other lesions possibly attributable to DDT were noted among the 7 animals. The brain and spinal cord were examined in each instance, and the large peripheral nerves in 4 of 7 instances.

## SUMMARY AND CONCLUSIONS

Microscopic examination was made of 117 animals of 9 different species after administration of DDT by inunction, by stomach tube, or by admixture in the diet. Although there were wide variations in sensitivity to the compound among the different individuals of a given species, the lesions caused were quite consistent throughout the different species.

On the higher dosage levels, with the animals surviving for 1 to several weeks, there was typically caused a moderate degree of central necrosis of the liver, or with the longer periods of survival a combination of central necrosis and reparative hypertrophy which can be labeled as a moderate subacute degeneration of the liver.

The thyroid often showed moderate colloid depletion, less often epithelial desquamation, and rarely epithelial hyperplasia.

Very slight to moderate focal necrosis of voluntary muscles occurred in about 20 percent of animals on the higher dosage levels.

Rabbits showed certain lesions not seen in the other species, a focal necrosis of the gall bladder, and an increased incidence of the "spontaneous" types of encephalitis and nephritis.

Dermatitis in inuncted animals was mild throughout except that rabbits on the highest doses showed slight focal necrosis of the epidermis.

For a given dosage level of DDT, chickens and guinea pigs showed fewer histological lesions than did the other species.

A special effort was made to determine nerve cell changes in the brain and spinal cord of animals with tremors. With routine fixation and staining (formalin and Orth's; hematoxylin-eosin) no changes could be seen that were not present in controls similarly and concurrently fixed and stained.

Rare myocardial and adrenal lesions may be of significance. DDT caused no or insignificant effects on bone marrow, bone, testis, pancreas, and spleen. Renal lesions were slight and infrequent.

Because of the tremors of long duration produced by it, DDT would appear to be a promising experimental agent for the neurophysiologist.

# DIAMOND POINTS AND THE DISCARD RATE OF STEEL DENTAL BURS [1]

By HENRY KLEIN, *Senior Dental Officer,* [2] *United States Public Health Service*

In the autumn of 1942 the civilian supply of steel dental excavating burs in the United States became restricted because of lend-lease commitments and because of the rapidly expanding requirements of the armed forces. The steel dental bur is an indispensable tool in the preparation of dental cavities for fillings. Restriction of the supply for civilian use required prompt investigation of all possible avenues for the purpose of identifying and developing other tools and adjuncts which might be of assistance in the threatening situation.

Conservation of available supplies of steel burs was immediately sought through joint action of the manufacturers, the dental profession, and the War Production Board. Three main points of attack were decided upon. First, the number of different types of burs manufactured was considerably reduced so that manpower, machine facilities, and steel supplies could be concentrated on the production of a few essential types; secondly, the resharpening of dulled burs was encouraged and the number of dentists who saved their discarded burs and had them resharpened increased tremendously; and thirdly, more and more dentists proceeded to conserve their steel burs through the use of stones and diamond points for the heavy jobs involved in cutting through tooth enamel in cavity preparation work. The steel burs were used in conjunction with the stones and points for finishing the cavities and for cutting in the relatively soft dentine.

It is the purpose of this note to report some preliminary findings on the degree to which diamond points extend the useful life of steel dental excavating burs. The findings were derived from experiments which were set up at Public Health Service dental clinics in the early spring of 1943.

The dentists on duty at the Baltimore Marine Hospital and those at the Public Health Service Dispensary, Washington, D. C., were each issued a set of steel burs and were asked to record each day (on a special form designed for the purpose) two main items of information: (a) the number of cavities prepared, and (b) the number of dental excavating burs discarded as dulled and therefore unfit for use. Whenever a bur was discarded, a fresh one was issued. The observations were collected daily over a period of approximately one month.

At the end of the first month's experiment a set of fresh steel burs and a set of diamond points were issued to each of five dentists at the Baltimore Marine Hospital. Five small points suitable for cavity

[1] From the Division of Public Health Methods.

[2] Consultant to the Chemicals, Drugs, and Health Supplies Branch, Office of Civilian Requirements, War Production Board.

work were included in each set. The dentists were asked to use the points for cutting through the tooth enamel. They were requested to use steel burs in conjunction with the points for work in the softer dentine. Records were made each day on the number of cavities prepared and the number of steel burs discarded as no longer fit for use. The findings of the two experiments are summarized in table 1.

TABLE 1

| Experiment A—Steel burs without diamond points | | | | Experiment B—Steel burs with diamond points | | | |
|---|---|---|---|---|---|---|---|
| Operator [1] | Number of steel burs discarded | Number of cavities prepared | Number of cavities prepared per bur discarded | Operator [2] | Number of steel burs discarded | Number of cavities prepared | Number of cavities prepared per bur discarded |
| 1 | 46 | 72 | 1.57 | 2 | 4 | 77 | 19.25 |
| 2 | 76 | 150 | 1.97 | 8 | 7 | 95 | 13.57 |
| 3 | 9 | 114 | 12.67 | 9 | 1 | 66 | 66.00 |
| 4 | 14 | 86 | 6.14 | 3 | 2 | 53 | 26.50 |
| 5 | 16 | 59 | 3.69 | 4 | 1 | 56 | 56.00 |
| 6 | 58 | 243 | 4.19 | | | | |
| 7 | 20 | 145 | 7.25 | | | | |
| All operators | 239 | 869 | 3.64 | All operators | 15 | 347 | 23.13 |

[1] The same operator in the two experiments is designated by the same number; that is, operator 2 in experiment A was also operator 2 in experiment B.
[2] Certain operators who were included at the start of the experiment were detailed to other stations during the progress of the study and were replaced by other dentists.

The data obtained from experiment A indicate that there exists a considerable individual variation in the bur discard rate among the different operators. Thus, without diamond points, one dentist was able to prepare more than 12 cavities per discarded bur, another dentist prepared more than 7 cavities per discard, while a third dentist was able to prepare only 2 cavities per discarded bur. All the operators in experiment A averaged together more than 3 cavities per discarded bur.

On the other hand, as shown by the data from experiment B, all the dentists using diamond points in conjunction with steel burs reduced the bur discard rates very significantly. Thus, operator No. 2, using diamond points and burs, was able to prepare more than 19 cavities per discard where before, in a situation in which he used burs alone (experiment A), he prepared fewer than 2 cavities per discard. In experiment B, operator No. 3 prepared 26 cavities per discard when he used diamond points in conjunction with burs, but in experiment A, when he used burs alone, he was able to prepare fewer than 13 cavities per discarded bur.

Considered all together, the operators in experiment B prepared more than 23 cavities per discarded bur. In contrast the dentists in experiment A, using burs alone, prepared fewer than 4 cavities per discard.

Accordingly, it may be noted that when diamond points were used in conjunction with steel burs for excavating cavities, the discard rate for steel burs was reduced to one-seventh of what it was when steel burs were used alone without diamond points. This very significant saving of burs occurred within the relatively short period of approximately one month (experiment B). The diamond points were not used up. They were still in good condition at the end of the experiment.

These findings, although preliminary in character, provide sufficient information to support the view that the use of diamond points in conjunction with steel burs for cavity excavation extends the useful life of the steel burs by at least 600 percent.

Grateful acknowledgment is due William T. Wright, Assistant Surgeon General (Dental), United States Public Health Service, for making possible the collection of the observations described here. Acknowledgment is also made of the cooperation of the several dental officers who participated in the study.

---

## PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

### June 18–July 15, 1944

The accompanying table (table 2) summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended July 15, 1944, the number reported for the corresponding period in 1943, and the median number for the years 1939–43.

#### DISEASES ABOVE MEDIAN PREVALENCE

*Poliomyelitis.*—The number of cases of poliomyelitis rose from 198 during the preceding 4-week period to 1,100 during the 4 weeks ended July 15. While every section of the country contributed to the increase, the largest increases were reported from States in the South Atlantic, Middle Atlantic, and East South Central regions. In the South Atlantic region the number of cases was about 17 times the 1939–43 median for the corresponding 4 weeks; in the Middle Atlantic region the number (232 cases) was almost 13 times the median, and in the East South Central section the incidence (184 cases) was almost 10 times the seasonal expectancy. Minor increases were reported from 4 other regions; the number of cases was about normal in the Mountain region and in the Pacific region the number reported was only about one-half of the normal seasonal incidence. More

than 80 percent of the total cases were reported from 11 States, viz, North Carolina 283 cases, New York 161, Kentucky 140, Pennsylvania, 65, Virginia 63, Ohio and California 36 each, Louisiana 31, Illinois 29, Florida 21, and Indiana 20—a total of 885 cases. In North Carolina, where the disease first appeared in epidemic form, the number of cases dropped from 94 cases during the preceding week to 63 for the week ended July 15. For the week ended July 22, the latest date available, there were 568 cases reported, with the largest increase over the preceding week occurring in the Middle Atlantic region; 225 cases, as against 133 during the week ended July 15.

Although a seasonal rise in poliomyelitis is expected the number of cases reported for the country as a whole was the highest for this period since 1934 when approximately 1,300 cases of poliomyelitis were reported. The incidence (1,100 cases) was 1.3 times the number of cases reported for the same period in 1943 and about 3 times the 1939–43 median. Table 1 shows the reported cases in geographic areas

TABLE 1.—*Number of cases of poliomyelitis reported in each geographic area for recent weeks of 1944 with comparative data for 1943 and 1941*

| Division | Week ended— | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | June | | | | July | | | |
| | 3 | 10 | 17 | 24 | 1 | 8 | 15 | 22 |
| All regions: | | | | | | | | |
| 1944 | 46 | 41 | [1] 111 | 126 | 222 | 290 | 462 | 568 |
| 1943 | 52 | 60 | 99 | 136 | 190 | 245 | 297 | 329 |
| 1941 | 20 | 32 | 26 | 67 | 79 | 82 | 187 | 246 |
| New England: | | | | | | | | |
| 1944 | 4 | 0 | 1 | 1 | 1 | 4 | 8 | 9 |
| 1943 | 1 | 3 | 3 | 3 | 0 | 1 | 6 | 3 |
| 1941 | 0 | 3 | 0 | 2 | 0 | 0 | 2 | 0 |
| Middle Atlantic: | | | | | | | | |
| 1944 | 11 | 4 | 4 | 12 | 33 | 62 | 125 | 216 |
| 1943 | 0 | 5 | 4 | 8 | 5 | 6 | 14 | 12 |
| 1941 | 1 | 4 | 6 | 2 | 5 | 8 | 7 | 17 |
| East North Central: | | | | | | | | |
| 1944 | 5 | 4 | 3 | 15 | 10 | 21 | 58 | 63 |
| 1943 | 0 | 3 | 2 | 1 | 1 | 8 | 4 | 12 |
| 1941 | 0 | 5 | 5 | 11 | 0 | 6 | 16 | 13 |
| West North Central: | | | | | | | | |
| 1944 | 1 | 0 | 2 | 5 | 7 | 9 | 8 | 25 |
| 1943 | 2 | 0 | 2 | 1 | 5 | 9 | 15 | 12 |
| 1941 | 2 | 1 | 0 | 3 | 1 | 2 | 11 | 7 |
| South Atlantic: | | | | | | | | |
| 1944 | 6 | 3 | 28 | 50 | 103 | 123 | 126 | 128 |
| 1943 | 6 | 0 | 2 | 2 | 2 | 1 | 6 | 9 |
| 1941 | 5 | 6 | 5 | 28 | 40 | 29 | 70 | 128 |
| East South Central: | | | | | | | | |
| 1944 | 5 | 9 | 10 | 22 | 34 | 37 | 91 | 90 |
| 1943 | 0 | 4 | 0 | 4 | 0 | 6 | 5 | 6 |
| 1941 | 2 | 2 | 3 | 8 | 16 | 30 | 57 | 74 |
| West South Central: | | | | | | | | |
| 1944 | 8 | 10 | 12 | 15 | 15 | 17 | 26 | 18 |
| 1943 | 8 | 11 | 35 | 51 | 107 | 137 | 148 | 148 |
| 1941 | 3 | 5 | 1 | 4 | 6 | 4 | 10 | 4 |
| Mountain: | | | | | | | | |
| 1944 | 0 | 1 | 3 | 3 | 1 | 6 | 2 | 1 |
| 1943 | 2 | 4 | 3 | 8 | 10 | 2 | 9 | 11 |
| 1941 | 0 | 1 | 0 | 2 | 4 | 0 | 0 | 2 |
| Pacific: | | | | | | | | |
| 1944 | 6 | 10 | 9 | 3 | 18 | 11 | 18 | 18 |
| 1943 | 33 | 30 | 48 | 58 | 60 | 75 | 90 | 116 |
| 1941 | 7 | 5 | 6 | 7 | 7 | 3 | 14 | 1 |

[1] Includes 39 delayed cases reported in North Carolina.

during recent weeks of 1944 with corresponding data for 1943 and 1941. The year 1943 shows an epidemic increase of poliomyelitis cases in the West South Central, Mountain, and Pacific regions; in 1944 an increase has occurred in all sections except the Mountain and Pacific sections. In 1942 the number of cases of poliomyelitis was the lowest recorded in recent years. The first increase of cases in the 1941 outbreak was also reported from the South Atlantic and East South Central regions.

*Meningococcus meningitis.*—Continuing its seasonal decline, the number of cases of meningococcus meningitis dropped from 1,167 during the 4 weeks ended June 17 to 792 during the current 4-week period. Compared with 1943 the number of cases was about 30 percent below the number reported in the corresponding period of last year. All regions except the East South Central reported a lower incidence than in 1943. The relatively low summer incidence of meningitis would indicate that the peak of the current epidemic, which has occurred in all sections of the country, has been passed, at least in most of the geographic sections. Although the reported incidence of meningitis was less than in the corresponding period in 1943, it was still above the 1939–43 median, which is based on 3 low interepidemic and 2 epidemic years.

*Scarlet fever.*—For the 4 weeks ended July 15 there were 5,673 cases of scarlet fever reported, as compared with 4,445 in 1943 and a 1939–43 median of 4,732 cases. Six of the nine geographic regions reported a relatively high incidence and in 3 regions the numbers of cases were below the expected seasonal average. The excesses over the medians ranged from 20 percent in the West North Central and West South Central regions to almost 3 times the median in the Pacific section. For the country as a whole the number of cases was the highest it has been during this period since 1940 when approximately 5,700 cases were reported for these same weeks.

*Rocky Mountain spotted fever.*—For the 4 weeks ending July 15 there were 125 cases of Rocky Mountain spotted fever reported, as compared with 93, 78, and 83 for the corresponding period in 1943, 1942, and 1941, respectively. Of the 125 cases reported for the current period, 65 occurred in the South Atlantic region, as compared with 49 in 1943, 32 in 1942, and 17 in 1941. Nineteen cases were reported in the East South Central region, as compared with 2, 4, and 3 cases for the same period in the 3 preceding years, and the Middle Atlantic region reported 13 cases, as compared with 9, 4, and 3 in 1943, 1942, and 1941, respectively. No cases were reported from the New England and West South Central regions and in the other regions the incidence was about normal. During the current period Maryland reported 23 cases, Virginia and North Carolina 16 each, Tennessee

8, New Jersey, Kentucky, Utah, and Wyoming 6 each, Alabama, New York, and West Virginia 5 each, and 11 other States reported from 1 to 4 each. Since the beginning of the year there have been 237 cases reported, as compared with 226, 243, and 291 for the same period in the 3 preceding years.

*Influenza.*—The incidence of influenza during the current 4-week period was lower than during the same 4 weeks in 1943, but the number of cases (1,936) was about 15 percent above the 1939–43 median. Increases over the median were reported from the New England, East South Central, and West South Central regions; in the latter region the number of cases was almost twice the preceding 5-year median.

DISEASES BELOW MEDIAN PREVALENCE

*Diphtheria.*—The number of cases of diphtheria (616) reported for the 4 weeks ended July 15 was only slightly below that reported for the corresponding period in preceding years. In 1943 there were 623 cases reported and the 1939–43 median is also 623 cases. In the Middle Atlantic and East North Central sections the incidence was considerably below the preceding 5-year medians, but in other sections the number of cases either closely approximated the median or was somewhat higher.

*Measles.*—The number of cases of this disease was relatively low during the 4 weeks ended July 15. A total of 21,021 cases was reported, as compared with 38,441 during the corresponding period in 1943, and a 5-year median of approximately 24,000 cases. In the West South Central and Pacific regions the numbers of cases were about twice the medians and the South Atlantic region reported a slight increase over the normal seasonal expectancy; in all other sections the incidence was comparatively low.

*Smallpox.*—For the current 4-week period there were 19 cases of smallpox reported, as compared with 24, 51, and 84 for the corresponding 4-week periods in 1943, 1942, and 1941, respectively. The East North Central region reported 10 cases, as compared with 5 in 1943, but the 1939–43 median for that section was 28 cases. Compared with the medians the situation was favorable in all sections of the country, and for the country as a whole the current incidence was the lowest on record for this period.

TABLE 2.—*Number of reported cases of 9 communicable diseases in the United States during the 4-week period June 18–July 15, 1944, the number for the corresponding period in 1943, and the median number of cases reported for the corresponding period, 1939–43*

| Division | Current period | 1943 | 5-year median | Current period | 1943 | 5-year median | Current period | 1943 | 5-year median |
|---|---|---|---|---|---|---|---|---|---|
| | Diphtheria | | | Influenza [1] | | | Measles [2] | | |
| United States | 616 | 623 | 623 | 1,936 | 2,616 | 1,690 | 21,021 | 38,441 | 23,946 |
| New England | 13 | 13 | 15 | 16 | 5 | 5 | 2,347 | 4,320 | 4,320 |
| Middle Atlantic | 64 | 102 | 102 | 10 | 23 | 22 | 3,935 | 12,572 | 6,666 |
| East North Central | 77 | 100 | 114 | 61 | 102 | 135 | 3,863 | 12,634 | 5,810 |
| West North Central | 62 | 38 | 45 | 8 | 53 | 42 | 923 | 2,496 | 1,263 |
| South Atlantic | 93 | 74 | 88 | 581 | 770 | 622 | 1,942 | 1,719 | 1,719 |
| East South Central | 45 | 45 | 46 | 97 | 65 | 73 | 238 | 503 | 503 |
| West South Central | 120 | 111 | 111 | 943 | 1,178 | 493 | 2,007 | 850 | 1,035 |
| Mountain | 42 | 30 | 47 | 166 | 264 | 199 | 603 | 1,071 | 1,071 |
| Pacific | 100 | 110 | 77 | 54 | 156 | 144 | 5,163 | 2,386 | 2,386 |
| | Meningococcus meningitis | | | Poliomyelitis | | | Scarlet fever | | |
| United States | 792 | 1,111 | 151 | 1,100 | 868 | 390 | 5,673 | 4,445 | 4,732 |
| New England | 42 | 128 | 11 | 14 | 10 | 5 | 643 | 862 | 507 |
| Middle Atlantic | 190 | 280 | 35 | 232 | 33 | 18 | 1,237 | 849 | 1,247 |
| East North Central | 145 | 176 | 15 | 104 | 14 | 33 | 1,412 | 1,059 | 1,601 |
| West North Central | 69 | 76 | 12 | 29 | 30 | 17 | 412 | 284 | 345 |
| South Atlantic | 121 | 194 | 47 | 402 | 11 | 24 | 457 | 264 | 266 |
| East South Central | 60 | 48 | 14 | 184 | 15 | 19 | 120 | 108 | 162 |
| West South Central | 50 | 56 | 13 | 73 | 443 | 43 | 152 | 154 | 124 |
| Mountain | 20 | 38 | 4 | 12 | 29 | 13 | 283 | 363 | 132 |
| Pacific | 95 | 115 | 12 | 50 | 283 | 93 | 957 | 502 | 356 |
| | Smallpox | | | Typhoid and paratyphoid fever | | | Whooping cough [2] | | |
| United States | 19 | 24 | 84 | 501 | 618 | 843 | 8,461 | 16,276 | 15,178 |
| New England | 0 | 0 | 0 | 20 | 27 | 24 | 566 | 606 | 941 |
| Middle Atlantic | 0 | 0 | 0 | 34 | 56 | 74 | 1,011 | 2,841 | 2,841 |
| East North Central | 10 | 5 | 28 | 49 | 98 | 98 | 1,575 | 3,710 | 3,710 |
| West North Central | 3 | 8 | 26 | 24 | 20 | 40 | 648 | 1,160 | 725 |
| South Atlantic | 1 | 0 | 1 | 118 | 138 | 188 | 1,978 | 3,120 | 2,298 |
| East South Central | 0 | 6 | 11 | 69 | 99 | 123 | 690 | 721 | 581 |
| West South Central | 2 | 0 | 6 | 138 | 149 | 256 | 1,096 | 2,035 | 1,453 |
| Mountain | 1 | 1 | 8 | 21 | 12 | 32 | 490 | 769 | 769 |
| Pacific | 2 | 4 | 6 | 28 | 19 | 29 | 407 | 1,314 | 1,314 |

[1] Mississippi and New York excluded; New York City included.
[2] Mississippi excluded.

*Typhoid and paratyphoid fever.*—For the current period there were 501 cases of this disease reported, as compared with 618, 700, and 843 for the corresponding period in 1943, 1942, and 1941, respectively. The 1939–43 median for this period was represented by the 1941 figure (843 cases). In the New England and Pacific sections the incidence was at about the median level, but all other sections reported very appreciable decreases from the normal seasonal expectancy. For the country as a whole the current incidence was the lowest on record for this period.

*Whooping cough.*—The incidence of whooping cough was relatively low, 8,461 cases being reported for the current period, as compared with a median of approximately 15,000 cases for the corresponding period in 1939–43. The East South Central section reported a larger number of cases than might be expected, but in all other sections the incidence was relatively low.

### MORTALITY, ALL CAUSES

For the 4 weeks ended July 15 there were 33,709 deaths from all causes reported by 93 large cities to the Bureau of the Census. The number of deaths was about 1,000 more than the average number reported for this period in the years 1941–43. For the first 3 weeks of the period the number of deaths compared favorably with the average for the same weeks in the 3 preceding years, but during the fourth week a rise occurred and the number of deaths reported was 12.7 percent more than the preceding 3-year average for the corresponding week which, however, was relatively low. A comparison by geographic regions shows that the greatest excess in the number of deaths during the 4-week period occurred in the East North Central region (8,784, as compared with an average of 7,427) with minor excesses in the New England, Middle Atlantic, East and West South Central, and Pacific regions; in the West North Central, South Atlantic, and Mountain regions the number of deaths was below the 3-year average.

## INCIDENCE OF HOSPITALIZATION, JUNE 1944

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among about 10,000,000 members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover about 60 hospital service plans scattered throughout the country, mostly in large cities.

| ITEM | June | |
|---|---|---|
| | 1943 | 1944 |
| 1. Number of plans supplying data | 68 | 71 |
| 2. Number of persons eligible for hospital care | 10,784,904 | 13,584,432 |
| 3. Number of persons admitted for hospital care | 103,880 | 134,792 |
| 4. Incidence per 1,000 persons, annual rate, during current month (daily rate × 365) | 117.2 | 121.1 |
| 5. Incidence per 1,000 persons, annual rate for the 12 months ending June 30 | 106.1 | 105.0 |

## DEATHS DURING WEEK ENDED JULY 22, 1944

[From the Weekly Mortality Index, Issued by the Bureau of the Census, Department of Commerce]

| | Week ended July 22, 1944 | Corresponding week, 1943 |
|---|---|---|
| Date for 93 large cities of the United States: | | |
| Total deaths | 7,783 | 8,293 |
| Average for 3 prior years | 8,188 | |
| Total deaths, first 29 weeks of year | 271,912 | 278,240 |
| Deaths under 1 year of age | 618 | 641 |
| Average for 3 prior years | 617 | |
| Deaths under 1 year of age, first 29 weeks of year | 18,000 | 19,563 |
| Data from industrial insurance companies: | | |
| Policies in force | 66,657,503 | 65,649,886 |
| Number of death claims | 12,127 | 11,736 |
| Death claims per 1,000 policies in force, annual rate | 9.5 | 9.3 |
| Death claims per 1,000 policies, first 29 weeks of year, annual rate | 10.3 | 10.2 |

# 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

### REPORTS FROM STATES FOR WEEK ENDED JULY 29, 1944

**Summary**

For the country as a whole the incidence of poliomyelitis increased during the current week. A total of 738 cases was reported, as compared with 568 last week, 361 for the corresponding week last year, and a 5-year (1939–43) median of 177. Of the current total, 652 cases, or 88 percent, were reported in the Middle Atlantic, South Atlantic, and East Central areas. Of the 14 States reporting more than 10 cases each, only North Carolina reported a decrease. An aggregate of 566 cases, or 77 percent, was reported in 8 States, as follows (last week's figures in parentheses): New York 237 (153), Pennsylvania 64 (56), Ohio 40 (14), Indiana 20 (10), Michigan 30 (24), Virginia 39 (30), North Carolina 57 (62), Kentucky 79 (77). Maryland reported 17 cases, Illinois 15, Alabama and California 13 each, Oregon 12, and Louisiana 11.

The largest number of cases previously recorded for the corresponding week since 1916 was 598, reported in 1931. For the 4-week period ended July 29, 1944, a total of 2,056 cases was reported, as compared with 1,232 for the corresponding period last year and 1,256 in 1937, the latter being the largest number reported for the corresponding 4-week period or for the month of July in any prior year since 1916, when the total for the month was 5,829. The total to date this year is 3,060, as compared with 2,316 last year and a median of 1,325 for the corresponding periods of the past 5 years.

A total of 251 cases of endemic typhus fever was reported, as compared with 185 last week, 130 for the corresponding week last year, and 90 for the 5-year median. Of the current total, 73 cases were reported in Texas, 52 in Georgia, 51 in Alabama, 28 in Florida, and 27 in Louisiana. The total to date this year is 2,079, as compared with 1,768 last year and a 5-year median of 1,168.

A slight increase occurred in the incidence of meningococcus meningitis for the country as a whole. The largest increase was in California—from 11 cases last week to 29 for the current week. New York reported 25 cases, Pennsylvania 11, Texas 12, and Michigan 10.

Of the total of 163 cases of typhoid fever, as compared with 184 last week and a 5-year median of 272, 27 occurred in Texas, 16 in North Carolina, 11 in New York, and 10 in Georgia.

A total of 7,965 deaths was recorded in 93 large cities of the United States for the current week, as compared with 7,783 last week and a 3-year average of 8,207.

*Telegraphic morbidity reports from State health officers for the week ended July 29, 1944, and comparison with corresponding week of 1943 and 5-year median*

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

| Division and State | Diphtheria | | | Influenza | | | Measles | | | Meningitis, meningococcus | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week ended— | | Median 1939–43 | Week ended— | | Median 1939–43 | Week ended— | | Median 1939–43 | Week ended— | | Median 1939–43 |
| | July 29, 1944 | July 31, 1943 | | July 29, 1944 | July 31, 1943 | | July 29, 1944 | July 31, 1943 | | July 29, 1944 | July 31, 1943 | |
| NEW ENGLAND | | | | | | | | | | | | |
| Maine | 0 | 1 | 0 | | | | 10 | 11 | 23 | 1 | 3 | 0 |
| New Hampshire | 0 | 0 | 0 | | | | 4 | 4 | 4 | 1 | 1 | 0 |
| Vermont | 0 | 0 | 0 | | | | 4 | 20 | 32 | 0 | 2 | 0 |
| Massachusetts | 2 | 0 | 1 | | | | 115 | 191 | 178 | 6 | 10 | 2 |
| Rhode Island | 1 | 0 | 0 | 8 | | | 11 | 79 | 31 | 3 | 1 | 0 |
| Connecticut | 1 | 0 | 1 | | | | 17 | 44 | 46 | 3 | 0 | 0 |
| MIDDLE ATLANTIC | | | | | | | | | | | | |
| New York | 7 | 3 | 8 | [1] 2 | | 4 | 190 | 438 | 355 | 25 | 36 | 5 |
| New Jersey | 1 | 1 | 3 | 2 | 2 | 2 | 58 | 345 | 183 | 8 | 5 | 0 |
| Pennsylvania | 9 | 7 | 7 | | 2 | | 85 | 57 | 74 | 11 | 16 | 2 |
| EAST NORTH CENTRAL | | | | | | | | | | | | |
| Ohio | 2 | 3 | 4 | 1 | 4 | 4 | 11 | 210 | 43 | 4 | 11 | 1 |
| Indiana | 5 | 1 | 2 | | 3 | 3 | 8 | 30 | 12 | 4 | 3 | 1 |
| Illinois | 4 | 8 | 16 | 3 | 7 | 6 | 32 | 168 | 77 | 8 | 14 | 1 |
| Michigan [2] | 4 | 6 | 1 | | 1 | | 49 | 354 | 133 | 10 | 7 | 1 |
| Wisconsin | 3 | 5 | 1 | 8 | 7 | 7 | 150 | 323 | 280 | 1 | 1 | 0 |
| WEST NORTH CENTRAL | | | | | | | | | | | | |
| Minnesota | 1 | 4 | 0 | | 2 | 1 | 13 | 77 | 19 | 4 | 1 | 0 |
| Iowa | 3 | 0 | 0 | | | | 40 | 17 | 20 | 1 | 3 | 0 |
| Missouri | 3 | 2 | 2 | | | | 6 | 29 | 8 | 6 | 10 | 1 |
| North Dakota | 0 | 1 | 3 | | | | 0 | 79 | 4 | 0 | 1 | 0 |
| South Dakota | 2 | 0 | 1 | | | | 2 | 21 | 2 | 0 | 0 | 0 |
| Nebraska | 7 | 3 | 1 | 2 | 1 | | 3 | 7 | 8 | 1 | 0 | 0 |
| Kansas | 0 | 2 | 1 | | | 2 | 14 | 29 | 28 | 2 | 2 | 1 |
| SOUTH ATLANTIC | | | | | | | | | | | | |
| Delaware | 0 | 1 | 0 | | | | 0 | 1 | 2 | 0 | 2 | 0 |
| Maryland [2] | 1 | 0 | 1 | | 2 | 2 | 4 | 43 | 27 | 5 | 7 | 2 |
| District of Columbia | 0 | 1 | 1 | | 1 | | 6 | 20 | 9 | 3 | 4 | 1 |
| Virginia | 0 | 3 | 3 | 32 | 86 | 45 | 13 | 39 | 39 | 4 | 5 | 1 |
| West Virginia | 0 | 3 | 3 | | 2 | 3 | 4 | 5 | 5 | 3 | 4 | 2 |
| North Carolina | 10 | 6 | 7 | | | | 59 | 22 | 21 | 4 | 8 | 0 |
| South Carolina | 3 | 5 | 4 | 72 | 131 | 87 | 16 | 15 | 12 | 3 | 3 | 1 |
| Georgia | 2 | 5 | 8 | 54 | 8 | 8 | 10 | 7 | 7 | 1 | 2 | 0 |
| Florida | 4 | 2 | 3 | 1 | 5 | 3 | 63 | 12 | 11 | 5 | 5 | 0 |
| EAST SOUTH CENTRAL | | | | | | | | | | | | |
| Kentucky | 4 | 0 | 3 | | | | 9 | 2 | 10 | 2 | 1 | 1 |
| Tennessee | 1 | 2 | 2 | 5 | 1 | 11 | 8 | 1 | 16 | 1 | 3 | 0 |
| Alabama | 6 | 3 | 4 | 4 | 39 | 3 | 13 | 19 | 19 | 5 | 2 | 3 |
| Mississippi [2] | 7 | 3 | 3 | | | | | | | 3 | 3 | 0 |
| WEST SOUTH CENTRAL | | | | | | | | | | | | |
| Arkansas | 0 | 0 | 1 | 14 | 2 | 5 | 4 | 3 | 17 | 3 | 3 | 0 |
| Louisiana | 15 | 5 | 4 | 3 | 7 | 3 | 11 | 1 | 3 | 1 | 3 | 1 |
| Oklahoma | 4 | 6 | 2 | 1 | 6 | 7 | 5 | 5 | 8 | 0 | 0 | 0 |
| Texas | 29 | 15 | 19 | 197 | 187 | 183 | 88 | 52 | 52 | 12 | 3 | 2 |
| MOUNTAIN | | | | | | | | | | | | |
| Montana | 1 | 2 | 0 | | | | 1 | 49 | 16 | 0 | 1 | 0 |
| Idaho | 1 | 0 | 0 | | | | 0 | 5 | 4 | 0 | 0 | 0 |
| Wyoming | 1 | 2 | 2 | | 10 | 5 | 8 | 10 | 10 | 0 | 0 | 0 |
| Colorado | 4 | 4 | 10 | | 15 | 14 | 11 | 17 | 16 | 0 | 0 | 0 |
| New Mexico | 1 | 1 | 1 | 2 | 2 | | 3 | 3 | 9 | 1 | 0 | 0 |
| Arizona | 4 | 1 | 0 | 12 | 34 | 23 | 7 | 24 | 25 | 0 | 0 | 0 |
| Utah [2] | 0 | 0 | 0 | | 1 | | 25 | 19 | 19 | 0 | 5 | 0 |
| Nevada | 0 | 0 | 0 | | | | 0 | 3 | 2 | 0 | 2 | 0 |
| PACIFIC | | | | | | | | | | | | |
| Washington | 5 | 3 | 1 | | | | 41 | 41 | 41 | 5 | 0 | 0 |
| Oregon | 5 | 0 | 0 | 3 | 4 | 4 | 17 | 49 | 49 | 2 | 1 | 0 |
| California | 11 | 8 | 10 | 7 | 24 | 24 | 482 | 201 | 201 | 29 | 9 | 4 |
| Total | 174 | 128 | 150 | 433 | 596 | 436 | 1,730 | 3,201 | 2,999 | 191 | 203 | 34 |
| 30 weeks | 6,172 | 6,743 | 7,119 | 337,289 | 80,073 | 150,757 | 587,804 | 531,495 | 463,284 | 12,609 | 12,982 | 1,330 |

[1] New York City only.

[2] Period ended earlier than Saturday.

*Telegraphic morbidity reports from State health officers for the week ended July 29, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.*

| Division and State | Poliomyelitis | | | Scarlet fever | | | Smallpox | | | Typhoid and paratyphoid fever [3] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week ended— | | Median 1939–43 | Week ended— | | Median 1939–43 | Week ended— | | Median 1939–43 | Week ended— | | Median 1939–43 |
| | July 29, 1944 | July 31, 1943 | | July 29, 1944 | July 31, 1943 | | July 29, 1944 | July 31, 1943 | | July 29, 1944 | July 31, 1943 | |
| **NEW ENGLAND** | | | | | | | | | | | | |
| Maine | 0 | 0 | 0 | 13 | 7 | 4 | 0 | 0 | 0 | 0 | 1 | 1 |
| New Hampshire | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vermont | 0 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Massachusetts | 8 | 1 | 1 | 38 | 78 | 48 | 0 | 0 | 0 | 4 | 5 | 1 |
| Rhode Island | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Connecticut | 3 | 7 | 1 | 8 | 16 | 9 | 0 | 0 | 0 | 0 | 0 | 1 |
| **MIDDLE ATLANTIC** | | | | | | | | | | | | |
| New York | 237 | 10 | 10 | 80 | 73 | 72 | 0 | 0 | 0 | 11 | 7 | 10 |
| New Jersey | 3 | 3 | 3 | 16 | 13 | 23 | 0 | 0 | 0 | 0 | 3 | 5 |
| Pennsylvania | 64 | 0 | 4 | 52 | 36 | 55 | 0 | 0 | 0 | 4 | 7 | 8 |
| **EAST NORTH CENTRAL** | | | | | | | | | | | | |
| Ohio | 40 | 5 | 5 | 66 | 50 | 50 | 0 | 0 | 0 | 8 | 24 | 14 |
| Indiana | 20 | 2 | 2 | 18 | 11 | 15 | 0 | 0 | 0 | 4 | 8 | 4 |
| Illinois | 15 | 6 | 6 | 31 | 27 | 55 | 0 | 0 | 0 | 3 | 7 | 13 |
| Michigan [2] | 30 | 8 | 7 | 33 | 23 | 50 | 0 | 0 | 0 | 1 | 5 | 5 |
| Wisconsin | 6 | 0 | 0 | 37 | 26 | 31 | 1 | 0 | 0 | 1 | 0 | 0 |
| **WEST NORTH CENTRAL** | | | | | | | | | | | | |
| Minnesota | 8 | 2 | 2 | 30 | 20 | 18 | 0 | 0 | 0 | 1 | 0 | 0 |
| Iowa | 4 | 0 | 2 | 42 | 8 | 11 | 0 | 1 | 1 | 1 | 0 | 2 |
| Missouri | 0 | 8 | 2 | 12 | 8 | 8 | 0 | 0 | 0 | 1 | 3 | 5 |
| North Dakota | 0 | 0 | 0 | 4 | 3 | 2 | 0 | 0 | 1 | 1 | 0 | 0 |
| South Dakota | 0 | 0 | 0 | 4 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| Nebraska | 1 | 0 | 2 | 6 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kansas | 9 | 30 | 3 | 14 | 14 | 20 | 0 | 0 | 0 | 1 | 1 | 3 |
| **SOUTH ATLANTIC** | | | | | | | | | | | | |
| Delaware | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Maryland [2] | 17 | 1 | 0 | 13 | 9 | 9 | 0 | 0 | 0 | 0 | 3 | 3 |
| District of Columbia | 4 | 0 | 0 | 5 | 3 | 3 | 0 | 0 | 0 | 0 | 1 | 0 |
| Virginia | 39 | 3 | 3 | 20 | 16 | 11 | 0 | 0 | 0 | 2 | 10 | 10 |
| West Virginia | 5 | 1 | 1 | 19 | 13 | 10 | 0 | 0 | 0 | 8 | 3 | 5 |
| North Carolina | 57 | 1 | 3 | 11 | 20 | 14 | 2 | 0 | 0 | 16 | 13 | 7 |
| South Carolina | 2 | 0 | 2 | 4 | 0 | 3 | 0 | 0 | 0 | 4 | 10 | 11 |
| Georgia | 8 | 1 | 4 | 10 | 11 | 7 | 0 | 0 | 0 | 10 | 16 | 18 |
| Florida | 3 | 0 | 1 | 0 | 4 | 3 | 0 | 0 | 0 | 3 | 3 | 3 |
| **EAST SOUTH CENTRAL** | | | | | | | | | | | | |
| Kentucky | 79 | 11 | 11 | 11 | 16 | 16 | 0 | 0 | 0 | 8 | 15 | 21 |
| Tennessee | 8 | 0 | 2 | 6 | 2 | 11 | 0 | 0 | 0 | 4 | 7 | 11 |
| Alabama | 13 | 2 | 2 | 0 | 8 | 11 | 0 | 0 | 0 | 6 | 17 | 9 |
| Mississippi [2] | 1 | 1 | 1 | 2 | 3 | 4 | 0 | 0 | 0 | 8 | 4 | 7 |
| **WEST SOUTH CENTRAL** | | | | | | | | | | | | |
| Arkansas | 0 | 6 | 2 | 8 | 1 | 1 | 0 | 0 | 0 | 6 | 8 | 14 |
| Louisiana | 11 | 0 | 2 | 2 | 0 | 3 | 0 | 0 | 0 | 6 | 6 | 14 |
| Oklahoma | 3 | 30 | 4 | 2 | 6 | 6 | 0 | 0 | 0 | 4 | 4 | 9 |
| Texas | 8 | 105 | 10 | 23 | 20 | 14 | 0 | 0 | 0 | 27 | 27 | 42 |
| **MOUNTAIN** | | | | | | | | | | | | |
| Montana | 1 | 0 | 0 | 9 | 4 | 4 | 0 | 1 | 0 | 2 | 2 | 0 |
| Idaho | 0 | 0 | 0 | 8 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| Wyoming | 0 | 0 | 0 | 6 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Colorado | 0 | 0 | 0 | 12 | 15 | 12 | 0 | 0 | 1 | 0 | 5 | 3 |
| New Mexico | 0 | 1 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 4 | 4 |
| Arizona | 1 | 0 | 0 | 4 | 5 | 1 | 0 | 0 | 0 | 0 | 3 | 3 |
| Utah [2] | 2 | 3 | 1 | 6 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 1 |
| Nevada | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **PACIFIC** | | | | | | | | | | | | |
| Washington | 1 | 2 | 0 | 22 | 6 | 8 | 0 | 0 | 0 | 1 | 0 | 1 |
| Oregon | 12 | 4 | 1 | 10 | 6 | 4 | 0 | 0 | 0 | 1 | 2 | 2 |
| California | 13 | 104 | 18 | 94 | 71 | 45 | 0 | 0 | 0 | 6 | 2 | 8 |
| Total | 738 | 361 | 177 | 819 | 677 | 706 | 4 | 2 | 6 | 163 | 237 | 272 |
| 30 weeks | [4] 3,060 | 2,316 | 1,325 | 145,388 | 95,462 | 95,462 | 287 | 598 | 1,164 | 2,748 | 2,661 | 3,549 |

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever cases reported separately as follows: Massachusetts 4, New York 3, Minnesota 1, West Virginia 2, South Carolina 1, Georgia 1, Florida 1, California 1.

[4] Cumulative figures changed by corrected reports.

*Telegraphic morbidity reports from State health officers for the week ended July 29, 1944, and comparison with corresponding week of 1943 and 5-year median*—Con.

| Division and State | Whooping cough | | | Week ended July 29, 1944 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week ended | | Median 1939–43 | Anthrax | Dysentery | | | Encephalitis, infectious | Leprosy | Rocky Mt. spotted fever | Tularemia | Typhus fever |
| | July 29, 1944 | July 31, 1943 | | | Amebic | Bacillary | Unspecified | | | | | |
| NEW ENGLAND | | | | | | | | | | | | |
| Maine | 24 | 18 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New Hampshire | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vermont | 33 | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Massachusetts | 66 | 92 | 126 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rhode Island | 6 | 32 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Connecticut | 52 | 25 | 62 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| MIDDLE ATLANTIC | | | | | | | | | | | | |
| New York | 174 | 260 | 321 | 0 | 1 | 11 | 0 | 3 | 0 | 2 | 0 | 0 |
| New Jersey | 84 | 169 | 169 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pennsylvania | 94 | 254 | 322 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| EAST NORTH CENTRAL | | | | | | | | | | | | |
| Ohio | 172 | 267 | 306 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Indiana | 9 | 48 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Illinois | 72 | 179 | 179 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 |
| Michigan [2] | 81 | 293 | 262 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wisconsin | 135 | 313 | 212 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WEST NORTH CENTRAL | | | | | | | | | | | | |
| Minnesota | 29 | 76 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Iowa | 8 | 45 | 31 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Missouri | 15 | 46 | 32 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| North Dakota | 10 | 57 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Dakota | 10 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nebraska | 29 | 28 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kansas | 33 | 92 | 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SOUTH ATLANTIC | | | | | | | | | | | | |
| Delaware | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Maryland [2] | 90 | 100 | 76 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| District of Columbia | 0 | 24 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Virginia | 92 | 124 | 68 | 0 | 0 | 0 | 260 | 0 | 0 | 4 | 2 | 1 |
| West Virginia | 28 | 52 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| North Carolina | 246 | 117 | 117 | 0 | 0 | 2 | 0 | 0 | 0 | 5 | 0 | 3 |
| South Carolina | 67 | 127 | 58 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 8 |
| Georgia | 13 | 16 | 16 | 0 | 3 | 8 | 0 | 0 | 0 | 0 | 2 | 52 |
| Florida | 18 | 19 | 19 | 0 | 4 | 1 | 0 | C | 1 | 0 | 0 | 28 |
| EAST SOUTH CENTRAL | | | | | | | | | | | | |
| Kentucky | 87 | 28 | 72 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Tennessee | 34 | 32 | 65 | 1 | 0 | 0 | 4 | 0 | 0 | 4 | 1 | 4 |
| Alabama | 14 | 64 | 26 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Mississippi [2] | ---- | ---- | ---- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| WEST SOUTH CENTRAL | | | | | | | | | | | | |
| Arkansas | 14 | 27 | 23 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 2 | 0 |
| Louisiana | 1 | 5 | 5 | 0 | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 27 |
| Oklahoma | 3 | 16 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Texas | 164 | 245 | 232 | 0 | 30 | 659 | 0 | 0 | 0 | 0 | 0 | 73 |
| MOUNTAIN | | | | | | | | | | | | |
| Montana | 37 | 34 | 11 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Idaho | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wyoming | 5 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Colorado | 27 | 28 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New Mexico | 2 | 7 | 19 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 |
| Arizona | 21 | 10 | 10 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 |
| Utah [2] | 72 | 85 | 78 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nevada | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PACIFIC | | | | | | | | | | | | |
| Washington | 30 | 53 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Oregon | 12 | 36 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| California | 85 | 231 | 231 | 0 | 5 | 11 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total | 2,301 | 3,807 | 3,759 | 1 | 48 | 745 | 313 | 8 | 1 | 22 | 11 | 251 |
| Same week, 1943 | 3,807 | ---- | ---- | 0 | 71 | 558 | 427 | 18 | 0 | 21 | 14 | 130 |
| Same week, 1942 | 3,693 | ---- | ---- | 3 | 44 | 289 | 397 | 8 | 0 | 28 | 17 | 120 |
| 30 weeks, 1944 | 56,564 | ---- | ---- | 24 | 954 | 12,080 | 4,264 | 331 | 17 | 284 | 355 | 2,079 |
| 30 weeks, 1943 | 121,874 | ---- | ---- | 37 | 1,225 | 8,686 | 3,526 | 354 | 17 | 277 | 548 | 1,768 |
| 30 weeks, 1942 | 112,867 | ---- | [3] 117,164 | 54 | 625 | 4,669 | 3,321 | 266 | 32 | [3] 305 | 591 | [3] 1,168 |

[2] Period ended earlier than Saturday.
[3] 5-year median 1939–43.

## WEEKLY REPORTS FROM CITIES

*City reports for week ended July 15, 1944*

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

| | Diphtheria cases | Encephalitis, infectious, cases | Influenza | | Measles cases | Meningitis, meningococcus, cases | Pneumonia deaths | Poliomyelitis cases | Scarlet fever cases | Smallpox cases | Typhoid and paratyphoid fever cases | Whooping cough cases |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cases | Deaths | | | | | | | | |
| **NEW ENGLAND** | | | | | | | | | | | | |
| Maine: | | | | | | | | | | | | |
| Portland | 0 | 0 | ------ | 0 | 3 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| New Hampshire: | | | | | | | | | | | | |
| Concord | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Massachusetts: | | | | | | | | | | | | |
| Boston | 2 | 0 | ------ | 0 | 53 | 2 | 12 | 0 | 13 | 0 | 0 | 22 |
| Fall River | 0 | 0 | ------ | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Springfield | 0 | 0 | ------ | 0 | 2 | 0 | 0 | 1 | 3 | 0 | 0 | 9 |
| Worcester | 0 | 0 | ------ | 0 | 1 | 0 | 6 | 0 | 4 | 0 | 2 | 13 |
| Rhode Island: | | | | | | | | | | | | |
| Providence | 0 | 0 | ------ | 0 | 5 | 1 | 4 | 0 | 0 | 0 | 0 | 5 |
| Connecticut: | | | | | | | | | | | | |
| Bridgeport | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Hartford | 0 | 0 | 1 | 0 | 7 | 0 | 3 | 0 | 1 | 0 | 0 | 2 |
| New Haven | 0 | 0 | 1 | 1 | 7 | 0 | 1 | 0 | 1 | 0 | 0 | 3 |
| **MIDDLE ATLANTIC** | | | | | | | | | | | | |
| New York: | | | | | | | | | | | | |
| Buffalo | 0 | 0 | ------ | 0 | 4 | 0 | 1 | 10 | 2 | 0 | 0 | 0 |
| New York | 5 | 0 | ------ | 1 | 55 | 15 | 60 | 16 | 34 | 0 | 4 | 60 |
| Rochester | 0 | 0 | ------ | 0 | 57 | 0 | 1 | 2 | 2 | 0 | 1 | 1 |
| Syracuse | 0 | 0 | ------ | 0 | 1 | 1 | 4 | 1 | 0 | 0 | 0 | 4 |
| New Jersey: | | | | | | | | | | | | |
| Camden | 0 | 0 | ------ | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Newark | 0 | 0 | 1 | 0 | 12 | 0 | 4 | 0 | 3 | 0 | 0 | 5 |
| Trenton | 0 | 0 | ------ | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| Pennsylvania: | | | | | | | | | | | | |
| Philadelphia | 0 | 0 | ------ | 0 | 19 | 2 | 17 | ------ | 22 | 0 | 2 | 28 |
| Pittsburgh | 1 | 0 | 1 | 1 | 3 | 3 | 8 | 19 | 3 | 0 | 0 | 7 |
| Reading | 0 | 0 | ------ | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **EAST NORTH CENTRAL** | | | | | | | | | | | | |
| Ohio: | | | | | | | | | | | | |
| Cincinnati | 0 | 0 | ------ | 2 | 1 | 2 | 8 | 1 | 13 | 0 | 0 | 17 |
| Cleveland | 0 | 0 | ------ | 0 | 4 | 0 | 5 | 1 | 7 | 0 | 0 | 25 |
| Columbus | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 19 |
| Indiana: | | | | | | | | | | | | |
| Fort Wayne | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Indianapolis | 3 | 0 | ------ | 0 | 2 | 1 | 1 | 1 | 2 | 0 | 0 | 15 |
| South Bend | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Terre Haute | 0 | 0 | ------ | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 5 |
| Illinois: | | | | | | | | | | | | |
| Chicago | 2 | 0 | ------ | 0 | 38 | 9 | 16 | 3 | 19 | 0 | 1 | 40 |
| Springfield | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Michigan: | | | | | | | | | | | | |
| Detroit | 2 | 0 | ------ | 0 | 57 | 2 | 5 | 9 | 18 | 0 | 0 | 80 |
| Flint | 0 | 0 | ------ | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 4 |
| Grand Rapids | 0 | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Wisconsin: | | | | | | | | | | | | |
| Kenosha | 0 | 0 | ------ | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 27 |
| Milwaukee | 0 | 0 | ------ | 0 | 44 | 1 | 0 | 0 | 4 | 0 | 0 | 22 |
| Racine | 0 | 0 | ------ | 0 | 45 | 0 | 1 | 0 | 0 | 0 | 0 | 10 |
| Superior | 0 | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| **WEST NORTH CENTRAL** | | | | | | | | | | | | |
| Minnesota: | | | | | | | | | | | | |
| Duluth | 0 | 0 | ------ | 0 | 33 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Minneapolis | 0 | 0 | ------ | 0 | 6 | 1 | 1 | 1 | 6 | 0 | 0 | 1 |
| St. Paul | 0 | 0 | ------ | 1 | 2 | 1 | 1 | 0 | 2 | 0 | 0 | 4 |
| Missouri: | | | | | | | | | | | | |
| Kansas City | 0 | 0 | ------ | 0 | 4 | 0 | 6 | 0 | 2 | 0 | 1 | 0 |
| St. Joseph | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| St. Louis | 2 | 0 | ------ | 0 | 1 | 6 | 6 | 1 | 1 | 0 | 1 | 20 |
| North Dakota: | | | | | | | | | | | | |
| Fargo | 0 | 0 | ------ | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |

*City reports for week ended July 15, 1944*—Continued

| | Diphtheria cases | Encephalitis, infectious, cases | Influenza | | Measles cases | Meningitis, meningococcus, cases | Pneumonia deaths | Poliomyelitis cases | Scarlet fever cases | Smallpox cases | Typhoid and paratyphoid fever cases | Whooping cough cases |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cases | Deaths | | | | | | | | |
| **WEST NORTH CENTRAL—continued** | | | | | | | | | | | | |
| Nebraska: | | | | | | | | | | | | |
| Omaha | 0 | 0 | ------ | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kansas: | | | | | | | | | | | | |
| Topeka | 0 | 0 | ------ | 0 | 6 | 1 | 0 | 0 | 2 | 0 | 0 | 7 |
| Wichita | 0 | 0 | ------ | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 4 |
| **SOUTH ATLANTIC** | | | | | | | | | | | | |
| Delaware: | | | | | | | | | | | | |
| Wilmington | 0 | 0 | ------ | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| Maryland: | | | | | | | | | | | | |
| Baltimore | 1 | 0 | ------ | 0 | 16 | 5 | 2 | 0 | 20 | 0 | 0 | 94 |
| Cumberland | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Frederick | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| District of Columbia: | | | | | | | | | | | | |
| Washington | 0 | 0 | ------ | 0 | 24 | 2 | 4 | 0 | 12 | 0 | 2 | 5 |
| Virginia: | | | | | | | | | | | | |
| Lynchburg | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 1 | 0 |
| Richmond | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | ------ |
| Roanoke | 0 | 0 | ------ | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 2 |
| West Virginia: | | | | | | | | | | | | |
| Charleston | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Wheeling | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| North Carolina: | | | | | | | | | | | | |
| Raleigh | 0 | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 12 |
| Wilmington | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 22 |
| Winston-Salem | 0 | 0 | ------ | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 11 |
| South Carolina: | | | | | | | | | | | | |
| Charleston | 0 | 0 | ------ | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| Georgia: | | | | | | | | | | | | |
| Atlanta | 1 | 0 | 3 | 1 | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 0 |
| Brunswick | 0 | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Savannah | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **EAST SOUTH CENTRAL** | | | | | | | | | | | | |
| Tennessee: | | | | | | | | | | | | |
| Memphis | 1 | 0 | ------ | 0 | 2 | 0 | 6 | 1 | 1 | 0 | 1 | 19 |
| Nashville | 0 | 0 | ------ | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Alabama: | | | | | | | | | | | | |
| Birmingham | 0 | 0 | ------ | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 1 | 2 |
| Mobile | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| **WEST SOUTH CENTRAL** | | | | | | | | | | | | |
| Arkansas: | | | | | | | | | | | | |
| Little Rock | 0 | 0 | ------ | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 4 |
| Louisiana: | | | | | | | | | | | | |
| New Orleans | 0 | 0 | 4 | 0 | 3 | 0 | 2 | 3 | 1 | 0 | 2 | 1 |
| Shreveport | 0 | 0 | ------ | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Texas: | | | | | | | | | | | | |
| Dallas | 2 | 0 | ------ | 0 | 5 | 0 | 4 | 2 | 0 | 0 | 0 | 3 |
| Houston | 3 | 0 | ------ | 0 | 0 | 0 | 4 | 1 | 1 | 0 | 0 | 0 |
| San Antonio | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **MOUNTAIN** | | | | | | | | | | | | |
| Montana: | | | | | | | | | | | | |
| Billings | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| Great Falls | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Helena | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Missoula | 1 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Idaho: | | | | | | | | | | | | |
| Boise | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Colorado: | | | | | | | | | | | | |
| Denver | 2 | 0 | 2 | 0 | 1 | 0 | 3 | 1 | 12 | 0 | 0 | 10 |
| Pueblo | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 |
| Utah: | | | | | | | | | | | | |
| Salt Lake City | 0 | 0 | ------ | 0 | 8 | 0 | 1 | 0 | 2 | 0 | 0 | 11 |

*City reports for week ended July 15, 1944*—Continued

| | Diphtheria cases | Encephalitis, infectious, cases | Influenza | | Measles cases | Meningitis, meningococcus, cases | Pneumonia deaths | Poliomyelitis cases | Scarlet fever cases | Smallpox cases | Typhoid and paratyphoid fever cases | Whooping cough cases |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cases | Deaths | | | | | | | | |
| PACIFIC | | | | | | | | | | | | |
| Washington: | | | | | | | | | | | | |
| Seattle | 0 | 0 | ------ | 0 | 11 | 0 | 2 | 1 | 5 | 0 | 1 | 2 |
| Spokane | 0 | 0 | ------ | 0 | 7 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| Tacoma | 0 | 0 | ------ | 0 | 8 | 0 | 0 | 0 | 2 | 0 | 0 | 3 |
| California: | | | | | | | | | | | | |
| Los Angeles | 8 | 0 | 2 | 0 | 97 | 2 | 6 | 1 | 18 | 0 | 0 | 10 |
| Sacramento | 0 | 0 | ------ | 0 | 22 | 0 | 1 | 0 | 3 | 0 | 0 | 0 |
| San Francisco | 0 | 0 | 1 | 0 | 48 | 1 | 7 | 1 | 9 | 0 | 0 | 1 |
| Total | 40 | 0 | 17 | 8 | 754 | 65 | 259 | 89 | 268 | 0 | 25 | 677 |
| Corresponding week, 1943 | 36 | ------ | 29 | 9 | 1,745 | ------ | 236 | ------ | 252 | 0 | 18 | 1,675 |
| Average, 1939–43 | 47 | ------ | 32 | [1] 11 | [2] 1,442 | ------ | [1] 238 | ------ | 324 | 1 | 32 | 1,269 |

[1] 3-year average, 1941–43.
[2] 5-year median.

*Dysentery, amebic.*—Cases: New York, 2; Philadelphia, 1; Charleston, S. C., 3; Houston, 1.
*Dysentery, bacillary.*—Cases: New York, 9; Detroit, 3; Charleston, S. C., 94; Los Angeles, 13.
*Dysentery, unspecified.*—Cases: Chicago, 1; Richmond, 2; Memphis, 1; Shreveport, 1; Houston, 1.
*Rocky Mountain spotted fever.*—Cases: St. Louis, 1; Richmond, 3.
*Tularemia.*—Cases: Nashville, 1.
*Typhus fever, endemic.*—Cases: Boston, 1; Atlanta, 1; Brunswick, 4; Savannah, 3; Mobile, 2; New Orleans, 6; Houston, 1.

*Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 34,197,000)*

| | Diphtheria case rates | Encephalitis, infectious, case rates | Influenza | | Measles case rates | Meningitis, meningococcus, case rates | Pneumonia death rates | Poliomyelitis case rates | Scarlet fever case rates | Smallpox case rates | Typhoid and paratyphoid fever case rates | Whooping cough case rates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case rates | Death rates | | | | | | | | |
| New England | 5.3 | 0.0 | 5.3 | 2.6 | 215 | 10.5 | 73.5 | 2.6 | 60 | 0.0 | 7.9 | 144 |
| Middle Atlantic | 2.8 | 0.0 | 0.9 | 0.9 | 71 | 9.7 | 46.3 | 22.2 | 31 | 0.0 | 3.2 | 49 |
| East North Central | 4.3 | 0.0 | 0.6 | 1.8 | 123 | 9.1 | 26.8 | 9.1 | 42 | 0.0 | 0.6 | 161 |
| West North Central | 4.0 | 0.0 | 0.0 | 2.0 | 113 | 21.9 | 39.8 | 8.0 | 32 | 0.0 | 4.0 | 72 |
| South Atlantic | 3.4 | 0.0 | 5.1 | 1.7 | 76 | 15.3 | 30.6 | 17.0 | 61 | 0.0 | 10.2 | 248 |
| East South Central | 5.9 | 0.0 | 0.0 | 0.0 | 12 | 11.8 | 70.8 | 5.9 | 6 | 0.0 | 17.7 | 124 |
| West South Central | 14.9 | 0.0 | 11.9 | 0.0 | 33 | 0.0 | 38.8 | 17.9 | 9 | 0.0 | 6.0 | 27 |
| Mountain | 23.8 | 0.0 | 15.9 | 0.0 | 71 | 0.0 | 47.7 | 7.9 | 119 | 0.0 | 0.0 | 199 |
| Pacific | 12.7 | 0.0 | 4.7 | 0.0 | 305 | 4.7 | 28.5 | 4.7 | 60 | 0.0 | 1.6 | 25 |
| Total | 5.5 | 0.0 | 2.6 | 1.2 | 115 | 9.9 | 39.6 | 13.6 | 41 | 0.0 | 3.8 | 104 |

## TERRITORIES AND POSSESSIONS

### Virgin Islands of the United States

*Notifiable diseases—April–June 1944.*—During the months of April, May, and June 1944, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

| Disease | April | May | June | Disease | April | May | June |
|---|---|---|---|---|---|---|---|
| Chickenpox | 4 | 37 | 10 | Pellagra | 1 | 1 | ------ |
| Dysentery (amebic) | 1 | ------ | ------ | Syphilis | 15 | 27 | 10 |
| Filariasis | 9 | 5 | 16 | Tetanus | 1 | 1 | ------ |
| Gonorrhea | 7 | 4 | 10 | Tuberculosis | 1 | 4 | 1 |
| Hookworm disease | 4 | 7 | 10 | Typhoid fever | 4 | ------ | 1 |
| Malaria | ------ | 1 | 1 | Typhus fever | 1 | ------ | ------ |
| Mumps | 1 | ------ | ------ | | | | |

# FOREIGN REPORTS

## CANADA

*Provinces—Communicable diseases—Week ended July 1, 1944.*—During the week ended July 1, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

| Disease | Prince Edward Island | Nova Scotia | New Brunswick | Quebec | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Chickenpox | | 45 | 1 | 57 | 271 | 27 | 25 | 67 | 51 | 544 |
| Diphtheria | 1 | 5 | 5 | 25 | | 4 | | | | 40 |
| Dysentery (bacillary) | | | | 5 | | | | | | 5 |
| German measles | | 2 | | 15 | 53 | 1 | 14 | 25 | 30 | 140 |
| Influenza | | | | | 6 | | | | 5 | 11 |
| Measles | | 6 | 2 | 693 | 371 | 110 | 38 | 58 | 55 | 1,333 |
| Meningitis, meningococcus | | | | 2 | 4 | | | | 1 | 7 |
| Mumps | | 2 | | 33 | 97 | 9 | 3 | 59 | 8 | 211 |
| Poliomyelitis | | | | | | 2 | | | | 2 |
| Scarlet fever | | 8 | 3 | 7 | 104 | 32 | 10 | 31 | 54 | 249 |
| Tuberculosis (all forms) | | 1 | 15 | 156 | 69 | 12 | 5 | 9 | 48 | 315 |
| Typhoid and paratyphoid fever | | | | 16 | | | 1 | | | 17 |
| Undulant fever | | | | 1 | 1 | | | | | 2 |
| Whooping cough | | 44 | | 26 | 41 | 6 | 5 | 17 | 10 | 149 |

## GREAT BRITAIN

*England and Wales—Infectious diseases—4 weeks ended April 29, 1944.*—During the 4 weeks ended April 29, 1944, cases of certain infectious diseases were reported in England and Wales as follows:

| Disease | Cases | Disease | Cases |
|---|---|---|---|
| Cerebrospinal fever | 320 | Pneumonia | 3,526 |
| Diphtheria | 2,420 | Puerperal pyrexia and puerperal sepsis | 617 |
| Dysentery | 851 | Scarlet fever | 7,330 |
| Measles (excluding German measles) | 9,760 | Smallpox | 2 |
| Ophthalmia neonatorum | 308 | Typhoid fever | 24 |
| Paratyphoid fever | 10 | Whooping cough | 8,141 |

## REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

### Plague

*British East Africa—Uganda.*—For the week ended June 24, 1944, 1 fatal case of plague was reported in Uganda, British East Africa.

*Egypt.*—For the week ended July 8, 1944, 1 fatal case of plague was reported in the southern area of Ismailiya, Egypt. For the week ended July 15, 1944, 5 cases of plague with 3 deaths were reported in Port Said, Egypt.

*Indochina—Annam.*—For the period June 11–20, 1944, 2 cases of plague were reported in Annam, Indochina.

### Smallpox

*British East Africa.*—For the week ended June 24, 1944, 368 cases of smallpox with 2 deaths were reported in Tanganyika, and 172 cases of smallpox were reported in Uganda, British East Africa.

*Indochina.*—For the period June 11–20, 1944, 49 cases of smallpox were reported in Indochina, including 32 cases in Cambodia and 10 cases in Annam.

*Turkey.*—For the month of May 1944, 239 cases of smallpox were reported in Turkey.

### Typhus fever

*Algeria.*—For the period June 11–20, 1944, 62 cases of typhus fever were reported in Algeria.

*Indochina.*—For the period June 11–20, 1944, 25 cases of typhus fever were reported in Indochina.

*Spain.*—For the week ended May 20, 1944, 22 cases of typhus fever were reported in Spain.

---

## COURT DECISIONS ON PUBLIC HEALTH

*Use of single-service containers for delivery of milk.*—(Illinois Supreme Court; *Dean Milk Co. et al.* v. *City of Chicago et al.*, 53 N.E.2d 612; decided January 20, 1944; rehearing denied March 22, 1944.) An ordinance of the city of Chicago provided that "any milk or milk products sold in quantities of less than one gallon shall be delivered in standard milk bottles." The plaintiff companies sought to deliver milk in single-service paper containers, contending that such containers were standard milk bottles within the meaning of the ordinance. The defendants construed the ordinance to mean that a standard milk bottle was a glass bottle.

The Supreme Court of Illinois said that the question presented was the meaning of the phrase "in standard milk bottles" and what the city council intended to include within that term when the ordinance was passed in January 1935. According to the court, in the construction of an ordinance, the intent of the council which passed it was controlling and the question was as to what the words used meant to

the council using them. As stated in the opinion the evidence showed, among other things, that the milk bottle was invented and first placed on the market in 1884; that for over 60 years the term "milk bottle" had had a very definite and well-understood meaning and included, in ordinary language, a type of glass bottle of characteristic size and shape with which almost everyone was familiar; that in 1935, when the ordinance involved was enacted, milk in less than gallon quantities was delivered exclusively in such bottles and that paper cartons were not used in Chicago or its vicinity for delivering milk; and that single service paper containers came into general use for the delivery of milk about 1938. Single-service paper containers, said the court, cannot be said to have been within the contemplation and intent of the council when the ordinance was enacted. "It is inescapable that the words 'standard milk bottles' as used in this ordinance mean the familiar glass milk bottles in common usage when it was adopted and cannot be construed to include 'paper single-service containers'."

While the plaintiffs did not question the city's power in 1935 to enact the ordinance in question, they argued that the State milk pasteurization plant act of 1939 repealed by implication the authority given by prior acts, so that the ordinance, applied as the city had construed it to forbid the delivery of milk in single-service paper containers, contravened the State's public policy as established by the milk pasteurization plant act and directly conflicted with such act. This contention was based on the statute's provision recognizing the use of paper containers, namely, "Single-service containers * * * shall be manufactured and transported in a sanitary manner." The plaintiffs' position was that the quoted provision of the law permitted the use of single-service containers and took away the city's power to prohibit such use. The act, said the court, construed as a whole, recognized that single-service containers may be used in the State; and it was also stated that the State department of public health had, in accordance with power granted, established standards and requirements for the manufacture and handling of such containers. Continuing, however, the court said that there was no provision in the statute that either expressly or by implication provided that cities had to permit the use of single-service containers. "The fullest meaning that may be given section 15, items 1 and 10, of the statute is that if single-service containers are permitted to be used in a city, they shall be manufactured and transported in a sanitary manner and shall conform to certain minimum requirements to be prescribed by the department of public health." It was necessary to construe the language in connection with the saving clause which specifically reserved to cities the power "to regulate the handling, processing, labeling, sale or distribution of pasteurized milk and

pasteurized milk products." This language, in the court's view, reserved to the city "the right to regulate, in the interests of providing pure milk, that part of the milk industry which pertains to the handling, processing, labeling, sale and distribution of pasteurized milk. This would include regulation as to the container in which it was delivered." The power of the city of Chicago to prohibit the delivery of milk in single-service containers was held not to be abridged or impaired by the statute in question.

A further contention of the plaintiffs was that the ordinance, if construed to prohibit the use of single-service paper containers, was unreasonable and, therefore, void. The court reviewed the evidence bearing on the question of reasonableness and concluded that the ordinance, insofar as it prohibited the use of single-service containers, was not unreasonable and void. The court pointed out that the maintenance of a pure and wholesome milk supply was one of the principal concerns of municipal government and stated that the evidence showed some valid reasons which the city council might well consider in requiring the use of the standard milk bottle. It was at least debatable and in such a case the city council was entitled to exercise its own legislative discretion and the courts would not disturb its action. "The council is the sole judge of the necessity and wisdom of the ordinance enacted, and we are concerned only with its reasonableness."

The supreme court reversed the judgment of the lower court which had granted (a) an injunction restraining defendants from enforcing the ordinance and (b) a writ of mandamus commanding defendants to issue a permit to plaintiffs allowing them to use single-service containers.

* * *

*Marijuana held synonymous with Indian hemp (cannabis sativa).*—(California District Court of Appeal, 2d District, Division 2; *People* v. *Savage*, 148 P.2d 654; decided May 9, 1944.) The defendant was convicted of violating section 11160 of the California Health and Safety Code which provided, among other things, that, except as otherwise provided in the law, no person should possess a narcotic except upon a written prescription. By section 11001 of the said code "narcotics" was declared to mean any of certain specified drugs, among which was cannabis sativa. The evidence showed that the defendant stated to a police officer that he knew that a cigarette found on him contained marijuana. Also at the trial the defendant stipulated that this cigarette and two other cigarettes found on the premises contained marijuana. On appeal by the defendant the California District Court of Appeal said that the sole question necessary for it to determine was: "Is marijuana synonymous with Indian

hemp (cannabis sativa)?" This question, said the court, had to be answered in the affirmative. "Marijuana (variants: mariahuana, marajuana, maraguana, marihuana, and mariguana) is another name for Indian hemp (cannabis sativa)." Continuing, the court said: "Since defendant admitted that the cigarette found on him contained marijuana, he admitted that it contained cannabis sativa which is a narcotic referred to in sections 11160 and 11001 of the health and safety code."

The judgment of the trial court was affirmed.

×