Public Health Reports

Vol. 62 • AUGUST 29, 1947 • *No. 35*

Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

THE FAMILY AND DENTAL DISEASE

V. CARIES EXPERIENCE AMONG PARENTS AND OFFSPRING EXPOSED TO DRINKING WATER CONTAINING FLUORIDE [1]

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It is well established that children who consume waters containing trace amounts of fluoride show, on the average, lower caries experience—that is, fewer DMF (decayed, missing and filled) teeth—than do children who drink fluoride-free waters (*1*). The reports in this connection mainly have been based on children 12–14 years of age and only preliminary information is available on the variation which undoubtedly exists (with regard to numbers of DMF teeth) among the children so exposed. Fluorination of community water supplies is being widely discussed now as a method of reducing the incidence of caries (*2*). Are some children protected more than others, and if so what factors account for such differences?

The present investigation is the fifth in a series of studies of the familial factors in dental disease and is concerned with the following specific question: Do children who drink fluoride waters all their lives (and averaging low DMF rates) show a variation in caries susceptibility related to that shown by their parents? In other terms, among children exposed to fluoride waters, do those who show the highest DMF rates have parents who have the highest caries susceptibility and, in a parallel sense, do the children who show the lowest rates have parents with the lowest susceptibility?

In a preceding publication caries experience in children was shown to be closely related to their parents' susceptibility.[1] The now well-confirmed finding that the drinking of water containing small amounts of fluoride is associated with reduced caries attack rates leads logically to the question as to whether an environmental factor, such as fluoride

[1] From the Division of Public Health Methods, United States Public Health Service. Preceding papers in this series are:

I. DMF Experience Among Husbands and Wives. J. Am. Dent. A. 32: 945 (1945)

II. Age of Parents and Dental Caries (DMF) Experience in Offspring. Am. J. Ortho. and Oral Surg. 32: 530 (1946)

III. Size of Family and Dental Caries (DMF) Experience in Offspring. Am. J. Ortho. and Oral Surg. 32: 533 (1946)

IV. Dental Disease (DMF) Experience in Parents and Offspring. J. Am. Dent. A. 33: 735 (1946) in drinking water, can overcome, and perhaps obscure, the more basic factor of familial susceptibility in dental disease.

The characteristics of the population on which the present investigation is based are uniquely appropriate for the investigation. The water supply was accidentally "fluorinated" in 1927, when the water sources were changed from shallow wells (presumably fluorine-free) to deep wells containing naturally from 1.4 to 2.2 p. p. m. fluoride.[2] As a consequence, the older population—the parents—consumed non-fluoride waters during most of the time their caries experience occurred. In contrast, their offspring—the newer generation—have been exposed to the new (fluoride) water all their lives. Hence the opportunity to examine the effects of 19 years of exposure to fluoride-water in an area where such water was not present before. Information obtained from this area may have important implications for other areas starting to or planning to fluorinate their water systems.

MATERIAL AND METHOD

Characteristics of the fluoride areas.—The communities in which the dental examinations[3] were conducted are grouped within an area having a 15 mile radius around the town of Glassboro, in southwestern New Jersey. Excepting Woodstown, in Salem County, all the communities are located in Gloucester County a roughly rectangular area some 10 miles wide and 30 miles long, extending from the Delaware River on the west to about the middle of the State to the east, where it adjoins Atlantic County. To the north it is bounded by Camden County and on the south largely by Salem County. The County of Gloucester, except for the industrial northwestern portion, is mainly agricultural, having a very productive soil for raising fruit and vegetables.

The town of Glassboro has approximately 5,000 persons. Pitman, some 3 miles northwest, includes about 5,500 persons. Woodstown, in Salem County, about 15 miles southwest of Glassboro, includes a little more than 2,000 persons. The three communities have individual water supplies, each derived from deep wells. The well at Glassboro is 654 feet deep, at Pitman is some 500 feet, and at Woodstown is 711 feet deep. Data obtained from single samples indicate that the water in Glassboro contains 1.3 p. p. m. of fluoride, that at Pitman (2 wells)

[2] The character of these waters was first pointed out by Dr. J. M. Wisan, State Department of Health, Trenton, N. J., who acknowledges indebtedness to Dr. J. S. Hyman (see Public Health News 27:139, October 1944).

[3] All dental examinations were made by the author with the assistance of Dr. J. F. Cody, Senior Assistant Dental Surgeon (R) United States Public Health Service. Appreciation is expressed to Mrs. Russell T. Atkinson, Pitman, N. J., for assistance in the examination procedure and processing of the statistical data.

1.4 and 1.7 p. p. m., respectively, and that at Woodstown, 2.2 p. p. m.

All persons who have lived in the three towns for the past 19 years have been consuming the fluoride waters. Accordingly, all children born in the area and not older than 19 years, who were permanent residents during the interval, have been exposed to the waters all their lives. On the other hand, the parents 30 years or older have been exposed to these waters since they were about 10 years old or older. This situation provides the rather unique opportunity to study the relation between the condition of teeth of parents not exposed to such waters during childhood and the condition of the teeth of their offspring exposed to the fluoride waters since birth.

Method of analysis.—The 123 fathers and 131 mothers examined were separated into three broad dental disease susceptibility groups.[4] Among the fathers, those considered of the lowest susceptibility showed from none to as many as 14 DMF teeth, those considered of midrange susceptibility showed from 15 to 19, while those considered to be highest in susceptibility had 20 to 32. Among the mothers, the low susceptibility group included all who had none to no more than 12 DMF teeth, midrange susceptibility included those having 13 to 19, while the high group included mothers having 20 to 32 DMF teeth.[5]

The second, and main, step is concerned with study of the DMF rates in the children of the high and low DMF parent-susceptibility groups. The age distributions and the DMF susceptibility of the mothers and fathers are given in table 1.

FINDINGS

Children continuously exposed to the fluoride waters average, at each age, a remarkably low DMF rate. Those 5–9 years of age average 0.3 DMF tooth, those 10–14 years of age average 1.5, and the 15–19-year-old children average only 3.0. In contrast, the corresponding DMF rates for New Jersey children residing in a nonfluoride area, for Maryland children, and for Japanese-Americans of Southern California are considerably higher. (See fig. 1.)

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[4] Evening clinics were held for examination of parents and adults. An informational letter was sent home with each school child requesting the parents to indicate the hour and evening they desired to have an examination. Although a good number of parents were examined, the strict criteria set up in the present analysis (parents of children born and brought up in the fluoride areas) account for the small number included in the present study.

[5] These groupings reflect the attempt to separate mothers and fathers into three DMF susceptibility groups of approximately equal numbers of persons. However, because the distribution of persons with various numbers of DMF teeth is not even, equalization of the groupings was not possible. The categories provide, however, a definite separation of adults (parents) into high and low susceptibility groupings with a reasonable number of parents in a middle DMF group. It will be noted that the following analysis is based only on the high and low groups.

TABLE 1.—*Age distributions and DMF susceptibility groupings of 123 fathers and 131 mothers of children born and brought up in a fluoride area of New Jersey*

Parents	DMF susceptibility groups	Age of parents (years)					
		Under 30	30–39	40–49	50 and over	Unknown	All
Fathers	Low	1	25	22	1		49
	Middle	1	19	14			34
	High	1	9	13	6	11	40
	All	3	53	49	7	11	123
Mothers	Low	3	29	7		1	40
	Middle	1	6	24	26		57
	High	1	12	8	2	11	34
	All	5	47	39	28	12	131

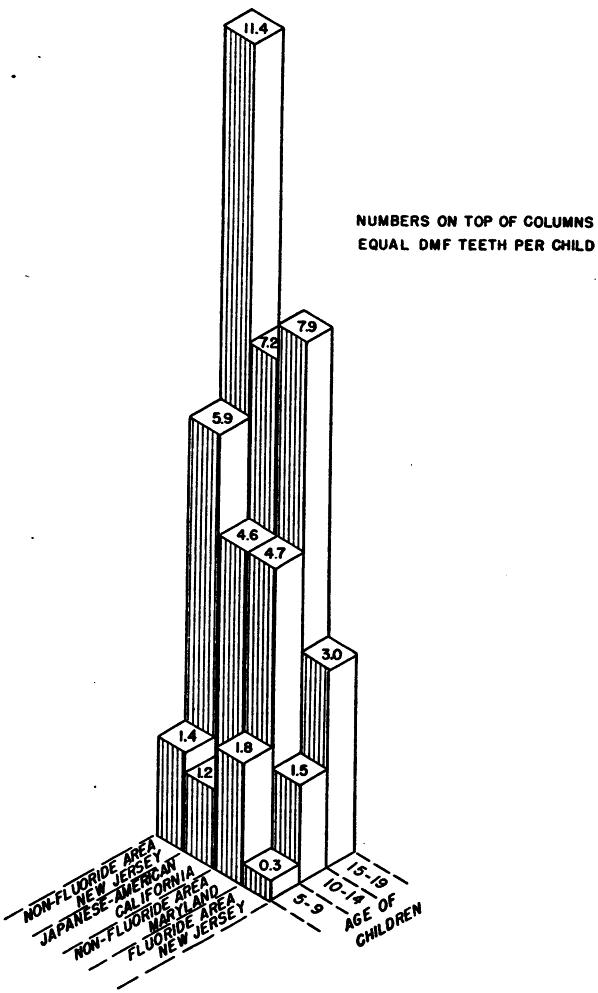

FIGURE 1.—Relationship between number of DMF teeth per child and age by specified geographic areas.

Among the New Jersey children residing in the fluoride area and averaging a low DMF rate, a large proportion (more than 50 percent) are completely free of any evidence of caries attack. However, some of the children do have dental caries or evidence of having been attacked (in some instances to a rather marked degree). Obviously, all children exposed to fluoride waters are not protected against caries to the same extent. Is that variation in any way related to the DMF susceptibility of their parents?

Among the children born and brought up in the fluoride areas those having high DMF fathers have higher DMF rates, at almost every age, than do the children who have low DMF fathers (table 2). The children of low DMF fathers average at 10 years of age about one-half a DMF tooth and a little more than 2 DMF teeth at 16 years of age (fig. 2). On the other hand, the children of high DMF fathers average 1 DMF tooth at 10 years of age and nearly 4 DMF teeth at 16 years of age.

The children (table 2 and fig. 2) of high DMF mothers average higher DMF rates at every age than do the children who have mothers with a low DMF rate. For example, among the children whose mothers' DMF level is known, those of low DMF mothers average less than one-half a DMF tooth at 10 years of age, and less than 1 DMF tooth at 15 years of age. In contrast, the children of high DMF mothers average nearly 1½ DMF teeth at 10 years, and about 4½ DMF teeth at 15 years of age.

Assortative mating.—Analysis of findings on children of marital pairs where husband and wife are both of the same DMF susceptibility groups (like-matings) cannot be treated extensively here since the paired couples total only 95 in number. Of these, 51 couples or 53.6 percent represented marriages of like with like; that is, low DMF husbands with low DMF wives, middle with middle, and high with high. The children of these like-matings total 72, a group too small to provide stable DMF rates for single-age groups.

On the basis of random selection, marriages of like with like in this group would be expected in 33.3 instances out of every 100 pairings. Accordingly, and on the basis of these data, from the dental viewpoint, marriages of persons of like DMF levels occur 19 percent more frequently than would be expected if the mate selection were random. Similar findings have been described for a group of more than 1,000 marital pairs of Japanese-Americans.[1]

COMMENT

Although the data presented here are fewer than desired, they are sufficient to indicate that children with continuous exposure to fluoride water since birth are as a group protected against caries attack.

TABLE 2.—*Number of children and number of DMF teeth per child of specified ages and of specified parents of particular DMF susceptibility groups. All children born and brought up in a fluoride area of New Jersey*

Parent	DMF susceptibility of parent	Children of both sexes			
		Age group	Average age [1]	Number of children	DMF teeth per child [2]
Fathers	Low	5-9	7.0	30	0.5
		10-14	10.6	22	0.5
		15-19	17.0	8	2.7
	High	5-9	7.7	22	0.2
		10-14	11.7	17	1.7
		15-19	16.3	10	4.1
Mothers	Low	5-9	7.1	32	0.2
		10-14	11.8	16	0.5
		15-19	15.3	3	0.8
	High	5-9	7.9	22	0.8
		10-14	12.3	18	2.1
		15-19	16.7	5	5.8

[1] Because numbers of DMF teeth increase with advancing age, and because of the method of selection of the parent susceptibility groups, the high DMF parents tend to be older in age and therefore the average age of their children tends to be higher than that of children of low DMF parents. Comparison of the DMF rates of the children of the two groups of parents (high and low DMF) takes account of these age differences as shown by the data plotted in fig. 2.
[2] Simple arithmetic average of the sex-specific rates.

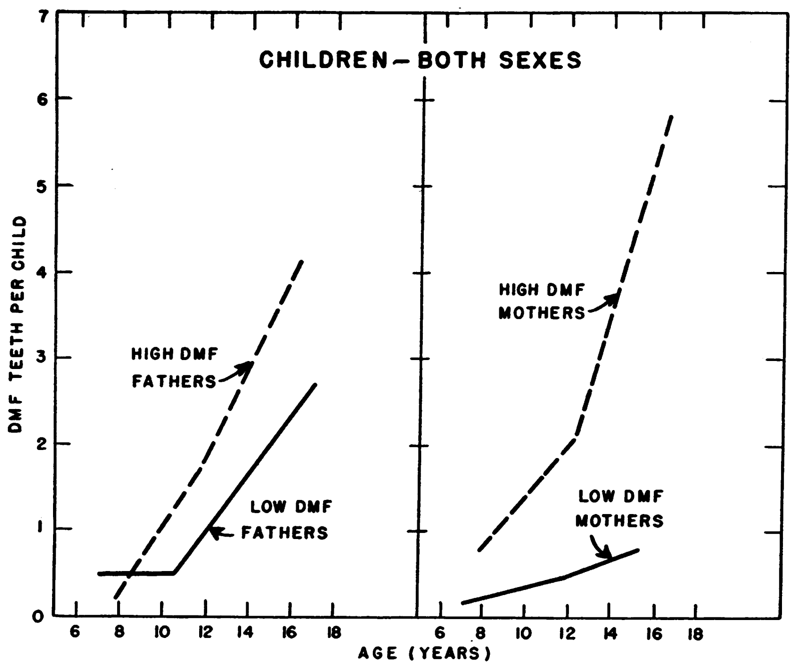

FIGURE 2.—Relationship between number of DMF teeth per child and the dental disease susceptibility levels of parents among a population continuously exposed to drinking waters containing fluoride.

However, the degree of protection varies among the exposed. Those who are protected least are children whose parents show the highest tendency toward dental disease, while those who are protected most are children whose parents show the lowest tendency to be attacked by dental disease.

Expressed in other terms, it appears from these data that caries experience in children is determined, among other factors, by familial susceptibility. Exposure to an environmental factor (fluroine in the diet) will reduce the amount of caries attack, but not sufficiently to obscure the influence of the familial factor which may be constitutional in origin.

For areas where fluorination of water supplies is contemplated or now under way, the findings of the present study are peculiarly pertinent since they are based on an experience of 19 years of exposure to fluorine. The data suggest that the control of dental caries may be not alone a problem of environment (fluorine in the diet) but perhaps also a problem of constitution (quality of parent stock).

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(*1*) Fluorine in dental public health: Symposium, New York Institute of Clinical Oral Pathology, New York, N. Y. (October 30, 1944)

(*2*) Ast, D. B.: Caries-fluorine hypothesis and suggested study to test its application. Pub. Health Rep. **58**:857 (June 4, 1943)

SMALLPOX IMMUNIZATION REQUIREMENTS FOR PERSONS ENTERING THE UNITED STATES FROM EUROPE

Europe is now considered among the areas from which introduction of smallpox is considered a threat. Persons arriving from Europe are now required to present a certificate showing that they have been successfully vaccinated against smallpox within the last three years, or show physical evidence that they have had smallpox.

Travelers who cannot prove immunity to smallpox must either consent to an immediate vaccination or remain under observation of quarantine officials until the incubation period for the disease is passed. This period will not exceed 14 days after arrival.

Increased air travel, which results in travelers reaching the United States before outbreaks of smallpox in foreign countries can be reported to quarantine officials, necessitated the new immunization requirement, according to United States Public Health Service officials who announced the new requirements on August 13, 1947.

As a further protection, arrangements are being made with the transportation industry to refuse to sell tickets to persons who cannot show proof of smallpox immunity. Until this ruling becomes effective, quarantine officers of the United States Public Health Service will continue to enforce the program of vaccinating or detaining all non-immune persons.

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EFFECTS OF DDT MOSQUITO LARVICIDING ON WILDLIFE

PART II. EFFECTS OF ROUTINE AIRPLANE LARVICIDING ON BIRD AND MAMMAL POPULATIONS [1]

By ARNOLD B. ERICKSON [2], *Biologist, United States Public Health Service*

Preliminary ecological investigations for a study of the effects on wildlife populations of DDT airplane sprayings at the Savannah River Refuge, South Carolina, were begun in September 1945. This refuge consists of about 13,000 acres of river bottom, much of which is subject to tidal fluctuations. A portion of the area, however, is protected by a series of dykes which prevent the constant influx of tidal water. Many of these dykes were built during the rice-growing era in the early part of the last century when the rich river bottoms were one vast rice field.

Where rice (*Oriza sativa*) once dominated the scene, cut-grass (*Zizaniopsis miliacea*) now is the dominant species in the ponds and low areas. Also occurring there are maiden cane (*Panicum hemitomon*), pickerel weed (*Pontederia lanceolata*), lotus (*Nelumbo lutea*), water lily (*Nymphaea odorata*), jussiaea (*Jussiaea leptocarpa*), and alligator-grass (*Alternanthera philoxeroides*).

The upland areas of the refuge are of two types—hammocks or small islands, and dykes connecting them. The dominant trees of the islands include live oak (*Quercus virginiana*), water oak (*Quercus nigra*), sweet gum (*Liquidambar Styraciflua*), pignut hickory (*Hicoria glabra*), hackberry (*Celtis laevigata*), and loblolly pine (*Pinus taeda*). Dominant trees of the dykes are chinaberry (*Melia Azedarach*), Chinese tallow tree (*Sapium sebiferum*), and black willow (*Salix nigra*). Dominant shrubs of islands and dykes include dwarf palmetto (*Sabal minor*), bayberry (*Myrica cerifera*), alder (*Alnus rugosa*), blackberry (*Rubus* sp.), winged sumac (*Rhus Copallinum*), yaupon (*Ilex vomatoria*), pepper vine (*Ampelopsis arborea*), St. Andrew's cross (*Ascyrum hypericoides*), French mulberry (*Callicarpa americana*), button bush (*Cephalanthus occidentalis*), elder (*Sambucus canadensis*), and silverling (*Baccharis halimifolia*). Dominant herbaceous plants include small cane (*Arundinaria tecta*), spiderwart (*Tradescantia pilosa*), Spanish moss (*Tillandsia usneoides*), inkberry (*Phytolacca americana*), partridge pea

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[1] During 1945 and 1946, extensive investigations were made in the Savannah, Georgia area by the Technical Development Division of the Communicable Disease Center, U. S. Public Health Service, to determine the effects on wildlife of the routine use of DDT larvicides. During the first season, studies were made of the effects of routine hand larviciding on fish, plankton, and surface and bottom organisms. During the second year, studies were made of the effects on wildlife of routine airplane applications of DDT larvicides in the form of sprays and aerosols. These investigations were similar to those made in 1945 but were extended to include the effects on reptiles, birds, mammals, and terrestrial insects. The field work was carried out at the Savannah River Migratory Waterfowl Refuge in cooperation with the U. S. Fish and Wildlife Service. This is the second in a series of papers reporting the results of these studies. Others of the series will appear at irregular intervals.

[2] Now with the Minnesota Division of Game and Fish, St. Paul, Minn.

(*Chamaecrista* spp.), periwinkle (*Vinca major*), May-pop (*Passiflora incarnata*), dog fennel (*Eupatorium capillifolium*), and lettuce (*Lactuca* spp.).

During the summer of 1946 about 815 acres of the refuge area were larvicided by airplane at weekly intervals with a 20 percent solution of DDT in a highly methylated naphthalene [3] at the rate of 0.1 pound of DDT per acre. The treated area included four ponds and their adjoining islands and dykes and a narrow zone around them. The larvicidal formulation was dispersed as a thermal aerosol over two of the ponds, while over the other two it was applied as a spray. The problem was to determine the effect of these repeated applications on certain wildlife populations.

Ten islands and six dykes were used regularly as study areas, and an attempt was made to pair certain islands and dykes in treated and untreated areas which had similar ecological conditions, so that their populations could be compared and changes due to treatment detected. Two ponds were sprayed routinely. One of these, which had an area of 135 acres and was bounded by 8 dykes and 13 islands, received 17 treatments between May 1 and September 4. The average amount of technical DDT recovered from these islands and dykes was 0.0458 ± 0.0068 pound per acre per treatment or a total of about 0.7786 pound per acre for the entire season. Six of the islands and three of the dykes surrounding the pond were directly compared with four untreated islands and three dykes in the check area. The other pond, which had an area of 130 acres, received 15 treatments between May 9 and September 4. No data were obtained on the amount of DDT deposited on the dykes surrounding this pond, but a portion of the dyke was studied for comparison with a similar portion of dyke adjoining the check pond.

Two ponds having areas of 75 and 195 acres received 15 and 14 aerosol treatments, respectively, between May 21 and September 4. Two thousand feet or 8.7 acres of the dyke bordering these ponds were studied and compared with a similar portion of dyke bordering the check pond which had an area of 850 acres. The treated dyke received an average dosage of 0.0084 ± 0.0015 pound of technical DDT per acre per treatment (about 0.1260 pound for the season) as determined by chemical analyses from 3 x 12-inch glass slides placed in the area.

Previous to spraying, islands were mapped, and numbered stakes were set out in rows 100 feet apart with 100 feet between the stakes in each row to form a grid to serve as markers for the census of singing male birds and the live trapping of mammals. One row of numbered stakes was also placed on each dyke with a 100-foot interval between

[3] Velsicol NR-70, a product of the Velsicol Corp. of Chicago, Ill.

the stakes. A hundred feet of marsh on each side of the dykes was included in the dyke census areas.

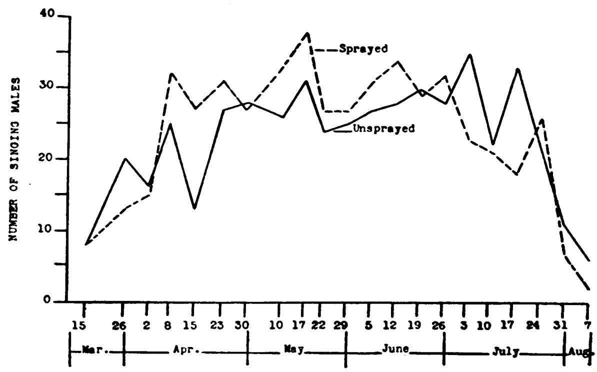

FIGURE 1.—Weekly number of singing males on sprayed and unsprayed islands and dykes of the Savannah Refuge.

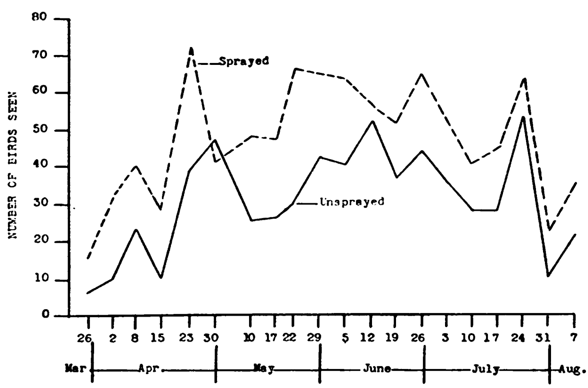

FIGURE 2.—Number of birds seen on weekly census of sprayed and unsprayed islands and dykes.

EFFECTS OF DDT LARVICIDING ON BIRDS

The effects of DDT on the population of breeding birds were determined by censuses of singing males by Stewart et al. (*1*) and Hotchkiss and Pough (*2*). This method has proved satisfactory when one heavy application of DDT was made and when censuses of singing males were taken immediately before treatment and a short time thereafter on both treated and check plots. Under conditions of actual larviciding, however, where light treatments were applied routinely over a considerable period, changes due to individual treatments were slight and it was necessary to make censuses at regular intervals on treated and check areas to obtain some idea of population trends in the two areas.

Populations as determined by weekly counts.—A weekly census of singing males was begun on March 26, 1946, on most of the areas at the Savannah Refuge, and was terminated on August 8. Early nesting species, like the parula and yellow-throated warblers, which completed their period of song by June 12, could be studied only during the first 6 weeks of the DDT applications. Most other species, however, continued to sing until the first week in August, at which time they had been subjected to 3 months of spraying.

The census of singing males and sight records on sprayed and unsprayed islands and dykes before the first treatment, and over the whole period of observations revealed similar population trends in both areas. Total numbers of birds seen or heard in specified treated and check areas are summarized in table 1.

TABLE 1.—*Number of pairs of birds on 30.8 acres of unsprayed and 51.7 acres of sprayed dykes and islands of the Savannah River Refuge as determined by census of singing males and the number of birds seen*

Species	Check area	Treated area	Species	Check area	Treated area
King rail	4	2	Loggerhead shrike	0	1
Mourning dove	8	13	Starling	0	2
Yellow-billed cuckoo	6	6	White-eyed vireo	5	1
Chuck-will's-widow	0	1	Red-eyed vireo	1	0
Flicker	2	4	Parula warbler	3	2
Red-bellied woodpecker	2	1	Yellow-throated warbler	1	1
Downy woodpecker	1	2	Yellowthroat	25	25
Kingbird	5	10	Yellow-breasted chat	3	2
Crested flycatcher	3	6	Redwing	36	52
Blue jay	2	5	Orchard oriole	5	11
Carolina chickadee	2	2	Purple grackle	8	20
Carolina wren	5	9	Summer tanager	1	0
L. B. marsh wren	10	19	Cardinal	7	8
Mockingbird	2	10	Painted bunting	3	2
Catbird	2	4	White-eyed towhee	8	12
Brown thrasher	8	8			
Blue-gray gnatcatcher	1	1	Totals	169	242

The number of singing males on both sprayed and unsprayed islands and dykes showed an increase during treatment which was caused apparently by the arrival of late migrants. The numbers of singing males heard by weeks, from March 15 to August 7, on the sprayed and unsprayed islands and dykes are shown graphically in figure 1. The spraying of DDT had no apparent effect on the males that had been singing in March, April, and May, for their singing continued into July and August. The slight variations that occurred in the distribution and numbers of singing males in sprayed and unsprayed areas during the summer were similar. The number of singing males increased on both areas from a low point at the beginning of the nesting season, fluctuated mildly during the season, and then dropped off at the end of the season. The absence of a sudden drop or a gradual decline in the population of the sprayed area indicates that the DDT spraying did not affect the population to any appreciable extent.

On each weekly census of singing males, the number of adult birds seen and/or heard calling (not singing) was recorded for each island and dyke. For some species this information was used as a check against the number of singing males, and it also made possible a population estimate of nonsinging birds. The numbers of birds seen or heard calling on the weekly census in the check and treated areas from March 26 to August 7 are shown graphically in figure 2. Populations increased rapidly from the low of March 26 to a peak between April 23–30, the height of the migration. Populations on both areas fell to a low level about a week after the first DDT spraying (May 1). For the remainder of the breeding season populations fluctuated mildly on sprayed and unsprayed areas, and then spurted up near the end of the season when some immature birds were probably counted with adults.

The fluctuations on both areas were similar, and it is evident that DDT had no appreciable effect on the weekly populations of the birds in the sprayed area.

EFFECTS OF DDT LARVICIDING ON MAMMALS

The effects of a single application of DDT on a white-footed mouse population has been determined by live trapping and marking the animals taken on treated and untreated areas before and after spraying (*3*). Studies completed in a relatively short period and measuring only one mortality factor (DDT) should give fairly accurate results. However, under conditions of actual malaria control during which many light applications of DDT are applied, repeated periods of trapping are required and results may be less clear-cut, as the effects of individual treatments are less marked and natural trends of populations may not be similar in check and treated areas over the entire period of study.

Two types of live traps were used for sampling rat and mouse populations, the Sherman metal trap and a fiber board modification of it. About 75 percent of the trapping was done with the Sherman metal traps. Fifty were used each week, 25 on the sprayed and 25 on the unsprayed area. From July 29 to September 4, 50 fiber board traps were used in addition.

From May 1 to May 7, rats and mice were marked by toe clipping. During the rest of the season animals were tagged in the left ear with numbered Monel metal fingerling tags.

The cotton rat (*Sigmodon hispidus*) was the most abundant rat on the refuge. This rodent, largely a vegetable feeder, might be less apt to ingest DDT than insectivorous animals. The wood rat (*Neotoma floridana*) and the rice rat (*Oryzomys palustris*), also vegetable feeders, were much less common than the cotton rat. Feral house mice (*Mus musculus*) were the second most abundant rodents trapped. Only one cotton mouse (*Peromyscus gossypinus*) was taken during the spray period.

From May 1 to September 6, 52 cotton rats were taken in 2,449 trap nights on 14 acres of unsprayed area. On 16.7 acres of sprayed area 106 cotton rats were trapped in 2,428 trap nights. Traps were set for about the same number of trap nights each week on each of the areas.

Eleven (21.1 percent) of the 52 cotton rats trapped on the unsprayed area were retaken. Eight were retaken once; two, twice; one, three times; and one, four times. Eight were retaken the week of tagging; one, the second week after tagging; three, the fifth week; and one, the ninth week. (The number retaken after tagging is greater than 11 because several rats were retaken the week of tagging and then again in the second, fifth, and ninth weeks.)

Twenty-seven (25.4 percent) of the 106 cotton rats trapped on the sprayed area were recaptured. Twenty-three were retaken once; two, twice; and two, three times. Sixteen were retrapped the week of tagging; two, one week after tagging; one, the third week; two, the fourth week; six, the fifth week; and three, the sixth week.

The fact that 21 percent of the cotton rats were retrapped on the unsprayed area and 25 percent on the sprayed area indicated that the activity of the rats and the rate of mortality were about the same on both areas. Also, there was little difference in the number of rats retrapped on each area the week of tagging and in subsequent weeks. These results indicate that DDT had no apparent effect on the rodent population of the sprayed area.

Twenty-one immature and 31 adult cotton rats were trapped on the unsprayed area and 50 immature and 54 adults on the sprayed area. Thus, DDT had no apparent effect on the reproductive portential of the rats on the sprayed area. Judging by trap catches, the potential was slightly greater in rats of the sprayed area.

Figure 3 shows that the number of cotton rats trapped by weeks over an 18-week period on sprayed and unsprayed areas was fairly uniform, when the difference in size of the areas is considered. On both areas the heavy and the light catches occurred near the same dates indicating that DDT was not affecting the rats of the sprayed area at any particular time during the season.

Two mortality factors constantly operative on both sprayed and unsprayed areas were predation and motor car traffic. On two occasions red-shouldered hawks were seen with cotton rats in their talons. One tagged and four untagged rats were found killed by trucks. The losses resulting from these two factors were probably the same on both areas.

TABLE 2.—*Sight observations of rabbits, raccoons, and cotton rats in given miles of driving in sprayed and unsprayed areas*

Date observed	Miles driven		Number of animals observed					
	Sprayed area	Unsprayed area	Sprayed area			Unsprayed areas		
			Rabbit	Raccoon	Rat	Rabbit	Raccoon	Rat
May 13–17	14.9	8.9	18	4	5	18	1	1
May 20–24	18.5	14.0	45	0	4	22	7	5
May 27–31	13.7	7.2	19	2	8	34	4	4
June 3–7	17.3	12.3	52	2	9	33	5	4
June 10–13	13.7	7.2	16	2	1	22	1	2
June 17–21	17.3	12.3	36	3	1	37	6	11
June 24–28	18.5	14.0	36	2	10	43	0	7
July 1–5	14.9	8.9	64	2	15	31	0	15
July 7–12	16.1	10.6	37	0	11	28	1	6
July 15–19	17.3	12.3	32	0	5	5	1	3
July 22–26	14.9	8.9	26	2	5	15	3	2
July 29–Aug. 2	16.1	10.6	18	3	5	10	1	6
Aug. 5–9	14.9	8.9	21	0	8	6	9	2
Aug. 12–16	16.1	10.6	8	2	0	9	2	4
Aug. 19–23	14.9	8.9	12	5	0	7	5	2
Aug. 26–30	17.3	12.3	12	6	3	15	2	4
May 13–Aug. 30	256.4	167.9	452	35	90	335	48	78

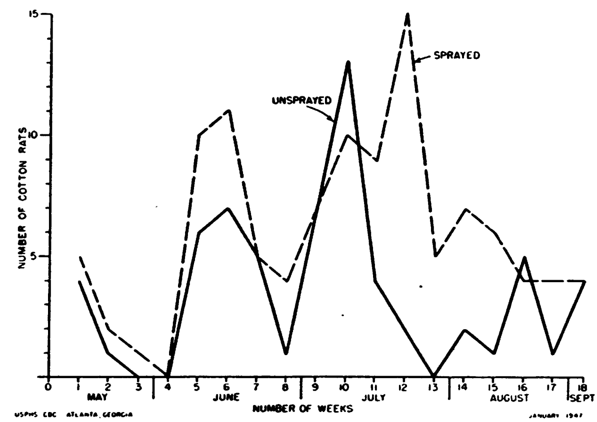

FIGURE 3.—Number of cotton rats trapped by weeks over an 18-week period on sprayed and unsprayed areas.

House-mice census.—Six house mice were trapped on the unsprayed area in 2,449 trap nights. Three (50 percent) were retrapped by the third week after tagging. On the sprayed area, 12 house mice were trapped in 2,428 trap nights. Four (33.3 percent) were retrapped after tagging, three the week of tagging, one the tenth week, and one the fourteenth week. These limited observations suggest that the house-mouse population of the sprayed area was not affected by DDT.

Sight observations on rabbits, cotton rats, and raccoons.—Daily sight observations while driving along the dykes were made on cottontail rabbits, cotton rats, and raccoons on sprayed and unsprayed areas from May 13 to August 30. There were 2.8 miles of unsprayed road and 3.7 miles of sprayed road on the islands and dykes. The number of observations and the miles of driving for the weekly periods are shown in table 2. Also, the numbers of observations on cottontail rabbits by weeks on the sprayed and unsprayed areas are shown in figure 4.

The variations by weeks in the numbers of observations of animals in table 2 and figure 4 can be accounted for in part by the growth of the animal litters, especially rabbits, to the point where the young were able to get about, and also to a certain extent by the weather. Observations were made during all types of weather and at all hours of the day. The fact that fluctuations in the number of observations on the two areas roughly paralleled one another indicated that DDT had no marked effect on the mammals of the sprayed area.

In 168 miles of driving in the unsprayed area, 174 observations were made on immature rabbits. In 256 miles of driving in the sprayed area, 244 observations were made on immature rabbits. Taking into account the difference in mileage of the two areas, the number of observations made on immature animals showed no significant difference. DDT, then, was not interfering with the reproductive capacity of the rabbits in the sprayed area as indicated by these counts.

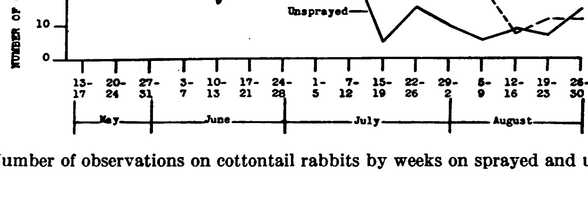

FIGURE 4.—Number of observations on cottontail rabbits by weeks on sprayed and unsprayed areas.

SUMMARY

1. Weekly airplane applications of DDT were made over a 17-week period on 815 acres of the Savannah River Refuge, South Carolina; the DDT was in the form of a 20 percent solution in a highly methylated naphthalene and was applied at a rate of 0.1 pound per acre per treatment.

2. The number of pairs of breeding birds on the 51.7 acres of sprayed and the 30.8 acres of unsprayed islands and dykes showed no significant

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difference between the areas. DDT had no apparent effect on the birds of the sprayed area.

3. The numbers of singing males heard by weeks from March 15 to August 7, on sprayed and unsprayed areas, increased in both areas at the beginning of the nesting season, fluctuated mildly during the season, and then dropped off at the end of the season. The absence of a sudden drop or a general gradual decline in the population of the sprayed area indicates that the DDT had no harmful effects.

4. The fluctuations of birds on both sprayed and unsprayed areas were similar and apparently DDT had no measurable effect on the population from week to week.

5. DDT had no detected effect on the cotton rat or house-mouse population of the sprayed area.

6. Daily sight observations were made on cottontail rabbits, cotton rats, and raccoons on sprayed and unsprayed areas from May 13 to August 30 while driving through the areas. Calculated on a weekly basis, the fluctuations in the number of observations on the two areas roughly paralleled one another, indicating that DDT had no effect on the mammals of the sprayed area.

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(*1*) Stewart, Robert E.; Cope, J. B.; Robbins, C. S.; and Brainerd, J. W.: Effects of DDT on birds at the Patuxent Research Refuge. Jour. Wildl. Mgt., **10**:195–201 (1946).

(*2*) Hotchkiss, Neil; and Pough, Richard H.: Effects on forest birds of DDT used for gypsy moth control in Pennsylvania. Jour. Wildl. Mgt., **10**: 202–207 (1946).

(*3*) Stickel, Lucille F.: Field studies of a *Peromyscus* population in an area treated with DDT. Jour. Wildl. Mgt., **10**: 216–218 (1946).

DEATHS DURING WEEK ENDED AUG. 2, 1947

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Aug. 2, 1947	Corresponding week, 1946
Data for 93 large cities of the United States:		
Total deaths	8,447	7,986
Median for 3 prior years	8,140	
Total deaths, first 31 weeks of year	292,455	289,518
Deaths under 1 year of age	673	671
Median for 3 prior years	654	
Deaths under 1 year of age, first 31 weeks of year	23,423	19,439
Data from industrial insurance companies:		
Policies in force	67,232,880	67,235,417
Number of death claims	11,958	11,286
Death claims per 1,000 policies in force, annual rate	9.3	8.8
Death claims per 1,000 policies, first 31 weeks of year, annual rate	9.6	10.0

EFFECTS OF DDT MOSQUITO LARVICIDING ON WILDLIFE

PART III. THE EFFECTS ON THE PLANKTON POPULATION OF ROUTINE LARVICIDING WITH DDT [1]

By E. L. Bishop, *Assistant Sanitarian* (R) [2] *United States Public Health Service*

The use of DDT as an anopheline larvicide has caused considerable concern in some groups because of the potentialities of destruction of other, more desirable forms of life in ponds and lakes. A series of studies has been undertaken to determine the extent, if any, of such damage. Among the organisms under consideration, fish are of prime importance to wildlife and sportsman interests, and might be affected in any of several ways: direct damage by poisoning and killing, reduction or destruction of desirable food organisms, or ecological changes resulting in unfavorable environmental and growth conditions.

Ecologically, there are three groups of important fish-food organisms in areas commonly larvicided: the fauna of the bottom, the plankton organisms, and the surface and shallow-water forms. The present paper, the third in a series reporting on the effects of DDT larviciding on wildlife, is a report on the plankton, which is the chief food source for several species of fish and most fish fry.

The present study was begun in the spring of 1945 on ponds located in the vicinity of Savannah, Ga. The ponds were all shallow and small, being typical of ponds in which breeding of *Anopheles quadrimaculatus* occurs.

MATERIALS AND METHODS

General.—Quantitative sampling of biological populations to determine the influence of external factors superimposed on normal seasonal trends offer several technical difficulties. Any change induced by experimental means must be greater in magnitude than the uncontrolled variations due to changing distribution, weather, food supply, and life cycles if it is to be detected.

In determining the influence of experimental procedures upon living organisms, it is very desirable that the life span of the organisms extend beyond the end of the experimental period, thus making it possible to study the effects upon known numbers and known individuals. For the plankton, such a plan is impossible except for experiments of very short duration, since the majority of the plankton organisms have extremely short life cycles, reproducing in some instances every few hours.

Another difficulty is the cyclical population fluctuations of various plankters. Most of the plankton organisms show peaks and depressions of population many times during the course of a single

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[2] Now with the University of Alabama.

season. These fluctuations may occur at different periods in different ponds, making any control of a seasonal experiment subject to considerable error.

A third major problem is that of one species replacing another either naturally or due to the treatments. When a poisonous substance is introduced into a heterogeneous population of lower organisms, it is usual to find that certain forms are susceptible to the poison, while other, very closely related forms show a high degree of resistance. These more resistant forms frequently show a compensatory increase in number, so that the total population may remain the same or even increase. Therefore, it is necessary, if all effects are to be detected, that the identification of the plankton be accurate at least to genus and preferably to species to separate these closely related forms.

From the practical standpoint of plankton as fish food, this replacement is unimportant if the replacing species is equal to that replaced in terms of size, habits, and food value. The important question is whether the total available fish food has been reduced. It being impractical to attempt to evaluate accurately each species in terms of its value as fish food, the organisms were separated into groups, largely on the basis of taxonomic position; it being assumed for the purpose of this study, that all species of a given group, such as Mastigophora, Infusoria, Synura, Rotatoria, etc., would be of roughly equal value as fish food. This type of grouping appeared to give the largest amount of usable information as it permitted the counting of a larger number of samples than would be possible if all specimens were classified to genus or species.

Sampling Equipment.—Quantitative sampling of plankton populations involves the separation of the organisms from known replicable quantities of water. Several methods have been devised for this sampling by Galtsoff et al. (*1*), of which two were used for this study.

Plankton trap: A box-like trap with sliding top and bottom, controlled by a trip lever, was initially used for sampling. This trap, designed for sampling from boats in large bodies of water, proved unsatisfactory in the small shallow ponds being tested, since it required a minimum depth of 3 feet of water to prevent contamination with silt and bottom organisms, and required that each sample be taken at a different location in the pond. Therefore, a new apparatus was designed.

Plankton pump: This apparatus (figure 1) consisted of a small pitcher-type well pump mounted on a lightweight stand (figure 2) which drew water through a 1½-inch hose 12 feet long, the intake end of which was supported on bamboo floats (figure 3). Calibration of the apparatus showed delivery of water with a replicable accuracy greater than 98.5 percent. The water was pumped into a metal funnel having

FIGURE 1.—Plankton pump ready for use.

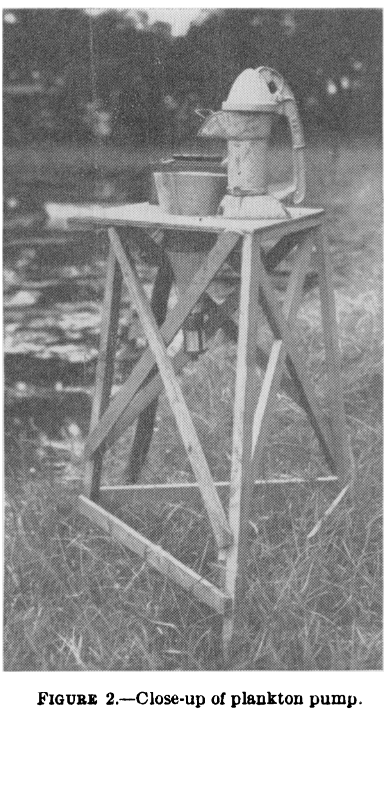

FIGURE 2.—Close-up of plankton pump.

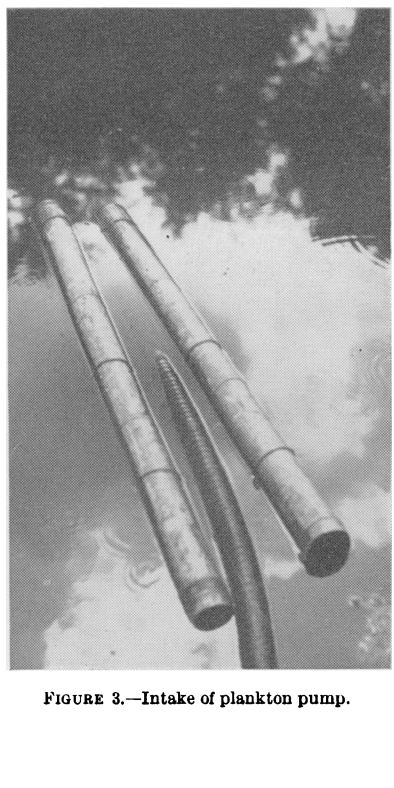

FIGURE 3.—Intake of plankton pump.

a bolting-silk plankton net and bucket attached. This apparatus permitted the sampling of ponds having a depth of 6 inches or more, without contamination or stirring up of the bottom. Also, a much larger number of samples could be taken from the smaller ponds, since it was unnecessary for the operator to wade through the water in taking the samples.

Sampling Methods.—Preliminary studies showed that the organisms in 10–15 liters of pond water (⅓ to ½ cubic foot) would form a sample giving sufficient numbers and vatieties of organisms to make analysis of data possible, without being too numerous for satisfactory counting. In these studies, therefore, one-half cubic foot of water was strained through the plankton net and bucket for each sample. Statistical tests showed that for the degree of accuracy desired, a minimum of 10 samples should be taken from each pond or sampling station at each date. (In the larger ponds, as many as 40 samples were taken, each group of 10 samples being taken from a different station.) The concentrated organisms from each sample were placed in a labeled vial and preserved with an equal volume of formalin-acetic acid-alcohol fixative.

Counting Methods.—In the laboratory, each sample was diluted to 50 ml. and shaken to insure uniform distribution. Then, two 1-ml. aliquot subsamples were immediately taken with a piston pipette and placed in chambered slides for counting. All organisms in these 1-ml. aliquot samples were identified and counted under the microscope, the results being tabulated on mimeographed forms.

Application of DDT.—Ponds were selected on the basis of total population, physical and ecological similarity, and availability of control areas. DDT was applied as a dust or as a solution in fuel oil. Concentrations of DDT used ranged from 0.2 lb. to 0.05 lb. per acre of water surface.

Treatments were made at weekly intervals over periods of from 6 to 18 weeks. Samples of plankton were taken for selected treatments just prior to and 48 hours after treatment. Each series of samples was taken at the same station, so that they could be handled as paired samples.

RESULTS

Factors external to these experiments, such as temperature, wind force and direction, diurnal phasic activities of the organisms, sunlight, degree of oxidation or putrefaction of the organic content, and seasonal trends, served to introduce variations which concealed to a large extent any potential variation introduced by the treatments. Thus, significant changes in the population of certain groups occurred naturally in both treated and untreated ponds, while there were only slight differences between treated and untreated ponds which could be definitely correlated with the experimental treatments. The differences found in the paired samples taken before and after individual treatments were generally not statistically significant. Tabular or graphic presentation of these changes is very difficult to interpret, due to the external factors of variation noted above. Therefore, the relationship of treatment to plankton populations is most clearly seen in line-graphs of *trends* of population (figures 4 through 7) rather than

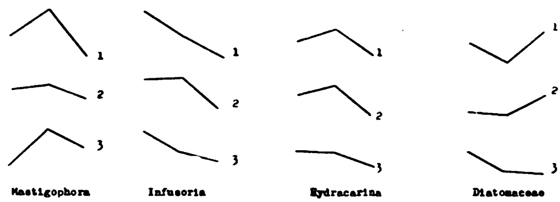

FIGURE 4.—Seasonal population trends of various organisms in DDT treated and untreated ponds over a period of 2½ to 3 months. Line 1 represents DDT spray treatment; line 2 represents untreated control ponds; line 3 represents DDT dust treatment.

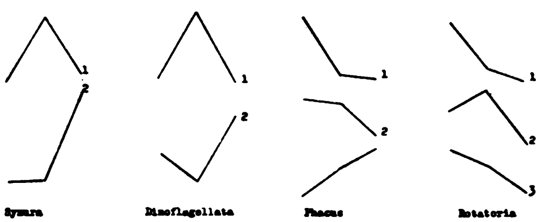

FIGURE 5.—Seasonal population trends of various organisms in DDT treated and untreated ponds over a period of 2½ to 3 months. Line 1 represents DDT spray treatment; line 2 represents untreated control ponds; line 3 represents DDT dust treatment.

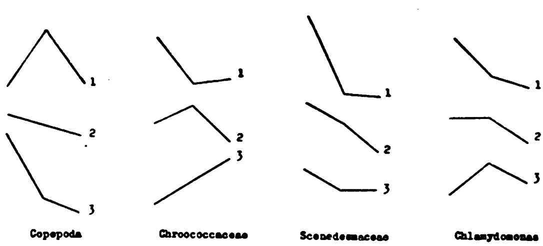

FIGURE 6.—Seasonal population trends of various organisms in DDT treated and untreated ponds over a period of 2½ to 3 months. Line 1 represents DDT spray treatment; line 2 represents untreated control ponds; line 3 represents DDT dust treatment.

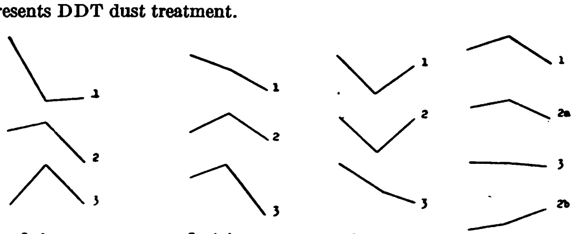

FIGURE 7.—Seasonal population trends of various organisms in DDT treated and untreated ponds over a period of 2½ to 3 months. Line 1 represents DDT spray treatment; line 2 represents untreated control ponds; line 3 represents DDT dust treatment.

by graphs of the actual numbers of organisms. The *slope* and direction of any line, rather than the location of the curve along the ordinate, is significant in this type of analysis. This slope, formed from 4 to 7 groups of samples, gives an indication of the population trend for the particular organism or group of organisms studied during the experimental period of 2½ to 3 months.

The method of plotting these lines is rather simple. All of the samples that were used to plot a given line were divided into three groups: those taken early in the season, those taken in midseason, and those taken late in the season. The percentage found in early season was taken for the ordinate of the first point on the line; the percentage taken in midseason was used as the ordinate for the second point; and the percentage taken late in the season was used as the ordinate for the third point. The three points were placed at equal distances along the abscissa. Since the total numbers taken differed widely between various groups of organisms, and even from one pond to another, the value of the ordinate cannot be interpreted in terms of numbers of organisms. Similarly the abscissa has no absolute interpretation in terms of calendar dates for the duration of the "season" varied somewhat from pond to pond. To avoid misinterpretation of the significance of these points, no coordinates are shown on the graphs. Further, to avoid the crossing of lines and the possibility of further confusion or misinterpretation of the ordinates, the ordinates for each of the three lines for any group of organisms were measured from a slightly different origin. In this way attention is centered on the slopes of the lines, which is the only basis of comparison. A steep negative slope indicates a great reduction of organisms from early season to midseason or from midseason to late season, as the case may be. A steep positive slope indicates an equally steep increase in the size of the population and a nearly horizontal line represents little seasonal changes in numbers of organisms.

In each series, line 1 refers to a pond treated with 0.05 pound of DDT in one gallon of fuel oil per acre, line 2 to an untreated control pond, and line 3 to ponds treated with 0.1 or 0.2 pound of DDT per acre as a 1-percent-DDT pyrophyllite dust.

The greatest degree of similarity or correlation existed between the curves of the following organisms: Mastigophora, Infusoria, Hydracarina, and Diatomaceae (fig. 4). Very poor correlation existed between the curves for Synura, Dinoflagellata, Phacus, and Rotatoria (fig. 5). The population of these organisms probably varied because the degree of putrefaction or stagnation varied widely in the ponds during the course of the experiment. Synura and Dinoflagellata occurred in such insignificant numbers in the dusted pond that their trend of abundance is not shown in figure 5.

In general, it will be noted that the correlation between lines 2 and 3 (untreated and dusted ponds) is better than that between line 1 (oiled ponds) and either of the other two. The comparison of lines for the total organisms (fig. 7) shows fair agreement in all instances (lines 1, 2b, and 3). However, if the two largest variants (Synura and Dinoflagellata) are eliminated from line 2b, line 2a is the result, showing much closer correlation. Since the two groups in question are "bloom" organisms, occurring sporadically in large numbers under conditions of stagnation and high temperature, it is believed that the omission is a logical one. In several of the control and oiled ponds, and in all of the dust ponds, these organisms appeared in such small numbers as to be insignificant.

These curves of population trends of organisms during the course of several months seem to indicate that there is little change in the total mass of organisms in a given amount of water, even though the composition of the population changes with seasonal food and physical changes. This observation is in agreement with those on fish and surface organisms. A more complete discussion of this phase of the problem is now in preparation by C. M. Tarzwell and will be published shortly.

CONCLUSIONS

1. The detrimental influence of DDT, as used for the control of malaria vectors upon the plankton organisms of smaller ponds, is indicated by these studies to be so slight in comparison with the larger variations due to climatic and other ecological factors, as to be relatively unimportant in upsetting the biological balance.

2. The population of the plankton as a whole approaches a constant figure; i. e., the total number of plankton organisms supported by a given volume of water remains approximately the same throughout the summer months.

3. No drastic killing of any specific group of organisms occurred from DDT treatment during the course of these experiments. Even though a few groups did show a slight reduction in number in the treated ponds over the control, in no instance were they wiped out or reduced to any marked degree.

4. It appears that the use of DDT as a mosquito larvicide will be restricted more by its potential dangers to the fish and the higher forms of life than by any harmful effects on the plankton organisms as a group.

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(1) Galtsoff, Paul S.; Lutz, Frank E.; Welch, Paul S.; and Needham, James G.: Culture Methods for Invertebrate Animals. Ithaca, N. Y., Comstock Publishing Co. (1937).

INCIDENCE 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 AUGUST 9, 1947

Summary

A total of 279 cases of poliomyelitis was reported for the current week, as compared with 218 last week, 1,575 for the corresponding week last year, and 701 for the 5-year (1942–46) median. Only 9 States reported currently more than 10 cases, and only 8 showed increases of more than 4 cases. These States are as follows (figures for last week in parentheses): *Increases*—Rhode Island 16 (7), Pennsylvania 18 (10), Ohio 18 (7), Illinois 27 (19), North Dakota 8 (2), Nebraska 23 (7), Kansas 6 (1), West Virginia 5 (0); *decreases*—Massachusetts 11 (14), New York 14 (22), California 19 (28). The 13 States reporting more than 15 cases during the past 3 weeks (figures for the corresponding period last year in parentheses) are as follows: Massachusetts 28 (24), Rhode Island 23 (3), New York 51 (143), Pennsylvania 37 (32), Ohio 35 (107), Illinois 55 (314), Michigan 33 (133), Minnesota 18 (805), Nebraska 43 (110), Tennessee 16 (33), Texas 25 (129), Idaho 19 (4), and California 63 (227). A total of 1,622 cases has been reported since March 15 (the approximate average date of seasonal low incidence), as compared with 6,558 for the corresponding period last year and a 5-year median of 3,217.

The current total of 163 cases of typhoid and paratyphoid fever (last week 124, 5-year median 161) includes a report of 40 cases in California of which 35 were reported as paratyphoid fever.

Of the total of 154 reported cases of undulant fever (last week 116), Iowa reported 35 (last week 16), Wisconsin 17, and California 15.

The total of 21 cases of infectious encephalitis includes 10 cases in California (last week 3), 5 in New York, and 3 in North Dakota.

Two cases of smallpox were reported during the week—1 each in West Virginia and Arkansas. The total for the year to date is 145, as compared with 275 for the same period last year and a 5-year median of 299.

Deaths recorded during the week in 93 large cities of the United States totaled 8,877, as compared with 8,447 last week, 7,866 and 7,919, respectively, for the corresponding weeks of 1946 and 1945, and a 3-year (1944–46) median of 7,919. The total for the year to date is 301,332, as compared with 297,384 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Aug. 9, 1947, and comparision with corresponding week of 1946 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 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46
	Aug. 9, 1947	Aug. 10, 1946		Aug. 9, 1947	Aug. 10, 1946		Aug. 9, 1947	Aug. 10, 1946		Aug. 9, 1947	Aug. 10, 1946	
NEW ENGLAND												
Maine	0	4	3	------	------	------	1	16	12	0	0	0
New Hampshire	0	0	0	------	------	------	------	11	------	0	0	0
Vermont	0	0	0	------	------	------	3	7	7	0	0	0
Massachusetts	3	7	3	------	------	------	47	114	80	0	1	3
Rhode Island	0	0	0	------	------	------	1	7	4	1	0	0
Connecticut	1	0	0	------	1	1	31	26	12	0	1	3
MIDDLE ATLANTIC												
New York	14	17	7	[1] 4	([1])	([1])	127	282	129	5	8	9
New Jersey	2	3	1	2	1	1	47	74	42	0	5	6
Pennsylvania	8	17	7	([2])	[3] 1	([2])	47	88	47	1	3	6
EAST NORTH CENTRAL												
Ohio	8	6	4	------	------	1	125	122	32	3	3	6
Indiana	1	4	5	------	------	3	17	9	7	0	3	3
Illinois	2	10	6	3	2	2	80	34	34	3	1	6
Michigan [3]	1	6	6	------	------	1	42	62	62	1	2	3
Wisconsin	4	5	2	8	28	9	143	112	112	2	1	1
WEST NORTH CENTRAL												
Minnesota	5	1	1	1	------	------	22	12	12	1	2	1
Iowa	0	6	4	------	------	------	25	22	9	1	1	1
Missouri	0	4	1	------	3	1	22	------	7	1	4	4
North Dakota	0	2	0	------	2	------	2	------	------	0	0	0
South Dakota	0	1	1	------	------	------	4	4	2	0	0	0
Nebraska	1	1	1	------	4	2	1	9	9	0	2	0
Kansas	6	9	3	1	1	------	10	6	6	1	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	1	2	------	0	0	1
Maryland [3]	0	4	2	------	------	------	4	34	5	1	1	2
District of Columbia	0	0	0	------	------	------	2	4	4	0	2	2
Virginia	2	6	6	73	103	37	21	32	11	2	2	2
West Virginia	1	0	2	8	1	1	3	3	1	2	0	0
North Carolina	10	6	10	------	------	------	30	8	29	1	2	2
South Carolina	2	3	7	201	128	98	29	52	11	0	0	0
Georgia	1	11	9	11	4	6	5	13	5	0	0	2
Florida	8	8	4	5	2	2	8	6	4	1	1	1
EAST SOUTH CENTRAL												
Kentucky	4	7	3	------	1	------	------	9	4	0	0	0
Tennessee	8	3	3	4	5	5	8	11	9	0	1	1
Alabama	2	7	7	10	1	9	8	5	3	0	0	1
Mississippi [3]	7	11	7	1	------	------	4	------	------	0	3	3
WEST SOUTH CENTRAL												
Arkansas	6	3	3	1	2	2	7	7	4	0	1	1
Louisiana	4	2	3	------	------	4	5	9	4	1	0	0
Oklahoma	0	1	1	6	2	2	1	4	6	3	0	0
Texas	13	18	22	209	205	205	82	105	50	5	3	3
MOUNTAIN												
Montana	0	0	1	11	8	------	15	9	9	1	0	0
Idaho	0	1	0	1	8	------	1	12	6	0	0	0
Wyoming	0	2	2	------	1	1	1	12	5	1	0	1
Colorado	3	8	3	2	2	4	22	22	20	1	0	1
New Mexico	0	1	1	------	------	------	3	8	2	0	2	0
Arizona	0	5	3	12	10	12	9	13	10	0	1	1
Utah [3]	0	0	0	------	------	------	5	12	12	1	0	0
Nevada	0	0	0	------	------	------	------	------	2	0	2	0
PACIFIC												
Washington	3	1	1	------	------	------	10	20	26	0	0	1
Oregon	0	6	2	------	------	3	16	8	20	0	2	2
California	7	17	17	6	5	6	32	105	133	4	7	7
Total	137	234	195	580	531	483	1,129	1,542	1,139	44	67	93
32 weeks	6,960	9,696	7,241	302,546	191,217	81,161	183,314	637,561	535,598	2,427	4,398	6,097
Seasonal low week [4]	(27th) July 5–11			(30th) July 26–Aug. 1			(35th) Aug. 30–Sept. 5			(37th) Sept. 13–19		
Total since low	663	1,068	864	1,033	1,020	1,020	206,201	663,685	573,611	3,399	5,902	8,549

[1] New York City only.
[2] Philadelphia only.
[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.

Telegraphic mobidity reports from State health officers for the week ended Aug. 9, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46	Week ended—		Median 1942–46
	Aug. 9, 1947	Aug. 10, 1946		Aug. 9, 1947	Aug. 10, 1946		Aug. 9, 1947	Aug. 10, 1946		Aug. 9, 1947 [5]	Aug. 10, 1946	
NEW ENGLAND												
Maine	0	2	2	4	22	10	0	0	0	0	0	0
New Hampshire	0	8	0	0	0	2	0	0	0	0	1	0
Vermont	1	0	2	7	2	2	0	0	0	1	0	0
Massachusetts	11	9	9	24	30	45	0	0	0	4	5	5
Rhode Island	16	3	1	0	2	1	0	0	0	0	0	0
Connecticut	4	1	10	2	6	6	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	14	70	70	52	71	54	0	0	0	5	5	8
New Jersey	5	18	21	10	19	18	0	0	0	1	2	3
Pennsylvania	18	12	12	20	37	32	0	0	0	10	4	9
EAST NORTH CENTRAL												
Ohio	18	25	14	62	44	49	0	0	0	3	5	5
Indiana	2	21	12	15	10	10	0	0	0	5	3	5
Illinois	27	131	70	14	25	28	0	0	0	1	4	4
Michigan [3]	14	74	8	18	34	34	0	1	0	3	4	4
Wisconsin	5	31	6	16	18	37	0	0	0	0	1	0
WEST NORTH CENTRAL												
Minnesota	4	360	7	11	8	14	0	0	0	0	0	0
Iowa	8	48	6	13	7	9	0	0	0	3	0	0
Missouri	2	80	5	8	3	5	0	0	0	2	3	4
North Dakota	8	24	2	3	0	2	0	0	0	0	0	0
South Dakota	1	70	0	1	6	6	0	0	0	1	0	0
Nebraska	23	41	5	1	4	3	0	0	0	1	0	0
Kansas	6	74	9	8	3	15	0	1	0	2	2	2
SOUTH ATLANTIC												
Delaware	5	1	1	1	2	1	0	0	0	0	0	0
Maryland [3]	1	2	2	13	9	9	0	0	0	2	3	3
District of Columbia	0	0	1	3	3	3	0	0	0	0	0	0
Virginia	4	5	5	14	14	13	0	0	0	4	7	7
West Virginia	5	3	3	3	10	22	1	0	0	6	1	5
North Carolina	3	2	5	4	7	23	0	0	0	2	2	3
South Carolina	0	1	2	1	2	4	0	0	0	8	6	4
Georgia	5	9	5	5	4	7	0	0	0	5	2	12
Florida	2	9	2	7	1	2	0	0	0	3	0	5
EAST SOUTH CENTRAL												
Kentucky	0	8	6	6	11	13	0	0	0	6	6	11
Tennessee	5	17	12	14	8	9	0	0	0	7	3	6
Alabama	0	44	6	2	4	8	0	0	0	1	0	3
Mississippi [3]	0	22	3	2	2	4	0	0	0	1	5	4
WEST SOUTH CENTRAL												
Arkansas	[6] 2	17	5	5	4	4	1	0	0	5	4	4
Louisiana	3	17	7	2	1	2	0	0	0	4	11	7
Oklahoma	1	40	18	1	6	5	0	0	0	5	9	6
Texas	7	34	34	12	20	22	0	0	0	9	18	18
MOUNTAIN												
Montana	2	6	1	1	1	3	0	0	0	2	1	0
Idaho	9	0	0	4	1	1	0	0	0	2	5	0
Wyoming	1	18	0	0	1	1	0	0	0	0	1	0
Colorado	2	53	7	8	17	10	0	0	0	0	0	1
New Mexico	1	9	2	1	0	0	0	0	0	3	3	2
Arizona	1	5	3	2	2	2	0	0	0	0	1	1
Utah [3]	1	7	7	4	5	5	0	0	0	1	1	0
Nevada	0	2	1	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	8	17	13	7	4	11	0	0	0	3	0	0
Oregon	5	10	10	5	6	6	0	0	0	2	2	1
California	19	115	40	39	59	60	0	0	0	40	8	3
Total	279	1,575	701	455	555	660	2	2	5	163	138	161
32 weeks	2,234	7,025	3,614	62,103	86,295	96,866	145	275	299	2,114	2,379	3,087
Seasonal low week [4]	(11th) July 15–21			(32nd) Aug. 9–15			(35th) Aug. 30–Sept. 5			(11th) Mar. 15–21		
Total since low	[6] 1,622	6,558	3,217	88,789	124,866	135,187	199	351	416	1,629	1,904	2,271

[3] Period ended earlier than Saturday.
[4] Dates between which the approximate low week ends. The specific date will vary from year to year.
[5] Including paratyphoid fever reported separately, as follows: Massachusetts 3 (salmonella infection); New York 1; New Jersey 1; Ohio 1; Indiana 1; Illinois 1; Michigan 1; Virginia 2; Georgia 1; Florida 1; Tennessee 2; Oklahoma 3; Texas 4; California 35.
[6] Delayed report: Poliomyelitis, Arkansas, week ended January 25, 1 case, included in cumulative total only.

Telegraphic mobidity reports from State health officers for the week ended Aug. 9, 1947, and comparison with corresponding week of 1946 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Aug. 9, 1947	Whooping cough: Week ended— Aug. 10, 1946	Whooping cough: Median 1942–46	Week ended August 9, 1947: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	10	24	24								1
New Hampshire	5	7									
Vermont	33	9	39								2
Massachusetts	94	116	116								1
Rhode Island	32	22	13								
Connecticut	54	36	36								2
MIDDLE ATLANTIC											
New York	247	155	251	6	10		5	1			5
New Jersey	205	165	165			1		4			1
Pennsylvania	216	90	188	1							1
EAST NORTH CENTRAL											
Ohio	490	54	150			2					
Indiana	30	20	34								
Illinois	145	161	161	6			2	1	2		16
Michigan [3]	208	262	205	6							3
Wisconsin	225	227	220								17
WEST NORTH CENTRAL											
Minnesota	139	22	42	4							
Iowa	29	38	20	2					2		35
Missouri	42	17	20						1		5
North Dakota	13	1	13			1	3				1
South Dakota		4	4					1			2
Nebraska	8	6	6	1							2
Kansas	85	40	40								3
SOUTH ATLANTIC											
Delaware	10	9	3		1						
Maryland [3]	91	31	69					1	1		2
District of Columbia	8	3	12								
Virginia	72	74	53			82		7	3		
West Virginia	21	25	25								1
North Carolina	49	76	136					11	2	1	1
South Carolina	145	42	67	1	8			1		3	5
Georgia	67	3	8		2			3	3	16	4
Florida	35	9	11	2			1			17	1
EAST SOUTH CENTRAL											
Kentucky	17	49	38	1				1			5
Tennessee	36	26	31	2		2		2	2		1
Alabama	54	10	22					1		2	
Mississippi [3]	11			1	3					6	3
WEST SOUTH CENTRAL											
Arkansas	27	15	15	3	12	7		1	5		1
Louisiana	3	8	8	1						2	3
Oklahoma	27	9	15						8		2
Texas	410	148	179	23	358	48			1	16	3
MOUNTAIN											
Montana	14	4	16								
Idaho	14	14	3					1			
Wyoming	6	4	4						2		
Colorado	82	14	20								9
New Mexico	12	4	4								
Arizona	18	1	11			19					
Utah [3]	10	1	36								1
Nevada			2								
PACIFIC											
Washington	21	45	36								
Oregon	9	28	28	1		1					
California	176	55	123	5	2		10			1	15
Total	3,755	2,183	2,744	66	396	163	21	36	32	64	154
Same week, 1946	2,183			44	343	194	23	29	17	104	118
Median, 1942–46	2,744			41	428	284	19	25	16	164	[7] 100
32 weeks: 1947	99,480			1,829	10,163	6,314	246	371	962	1,247	3,728
1946	62,414			1,431	11,393	4,335	361	382	612	1,984	3,130
Median, 1942–46	82,149			1,158	11,393	4,335	361	348	579	2,054	[7] 3,080

[3] Period ended earlier than Saturday.
[7] 2-year average, 1945–46.

Leprosy: California 1 case.

Alaska, week ended August 9: Chickenpox 54; pneumonia 2; German measles 3; influenza 1; typhoid fever 6.

Territory of Hawaii, week ended August 9: Diphtheria 1; leprosy 2; measles 1; meningitis meningococcus 1, poliomyelitis 2; whooping cough 44.

WEEKLY REPORTS FROM CITIES [1]

City reports for week ended August 2, 1947

This table lists the reports from 88 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.

Division, State, and City	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	------	0	1	0	0	0	0	1
New Hampshire:												
Concord	0	0	------	0	------	0	1	0	0	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	5	0	------	1	12	1	3	7	23	0	0	18
Fall River	0	0	------	0	2	0	1	1	0	0	0	5
Springfield	0	0	------	0	------	0	0	0	0	0	0	------
Worcester	0	0	------	0	------	0	3	1	0	0	0	2
Rhode Island:												
Providence	0	0	------	0	4	0	0	3	1	0	0	16
Connecticut:												
Bridgeport	0	0	------	0	1	0	0	0	0	0	0	------
Hartford	0	0	------	0	6	0	0	0	0	0	0	5
New Haven	0	0	------	0	4	0	2	0	0	0	0	15
MIDDLE ATLANTIC												
New York:												
Buffalo	2	0	------	0	1	1	5	0	0	0	0	10
New York	5	1	------	1	100	2	32	11	22	0	3	71
Rochester	2	0	------	0	------	1	3	0	4	0	0	9
Syracuse	0	0	------	0	------	1	1	0	1	0	0	38
New Jersey:												
Camden	1	0	1	1	------	0	2	0	0	0	0	1
Newark	0	0	1	0	7	0	3	0	3	0	1	51
Trenton	0	0	------	0	------	0	2	0	1	0	0	1
Pennsylvania:												
Philadelphia	2	0	------	0	8	1	8	3	4	0	1	106
Pittsburgh	0	0	------	0	1	0	3	1	6	0	1	59
Reading	0	0	------	0	------	0	0	0	1	0	0	------
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	------	0	0	1	1	0	0	10
Cleveland	1	0	------	0	6	0	5	2	7	0	0	147
Columbus	1	0	------	0	14	0	2	3	2	0	0	18
Indiana:												
Fort Wayne	0	0	------	0	2	0	1	0	0	0	0	5
Indianapolis	1	1	------	0	1	1	4	0	0	0	2	37
South Bend	0	0	------	0	------	0	0	0	0	0	0	2
Terre Haute	0	0	------	0	------	0	2	0	0	0	0	2
Illinois:												
Chicago	0	0	------	0	19	1	16	13	7	0	0	47
Springfield	0	0	------	0	7	1	3	1	0	0	0	2
Michigan:												
Detroit	0	0	------	0	4	0	8	0	0	0	0	------
Flint	0	0	------	0	1	0	2	0	1	0	0	------
Grand Rapids	0	0	------	0	12	0	0	0	1	0	0	28
Wisconsin:												
Kenosha	0	0	------	0	4	0	0	0	0	0	0	11
Milwaukee	0	0	------	0	12	0	0	1	1	0	0	38
Racine	0	0	------	0	8	0	0	2	10	0	0	20
Superior	0	0	------	0	------	0	0	0	0	0	0	1
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	2	0	0	1	1	0	1	14
Minneapolis	0	0	------	0	14	0	5	0	2	0	0	9
Missouri:												
Kansas City	0	0	------	0	------	0	4	0	1	0	0	10
St. Joseph	0	0	------	0	------	0	0	0	0	0	0	------
St. Louis	2	0	------	0	15	0	7	2	2	0	0	37

[1] In some instances the figures include nonresident cases.

City reports for week ended Aug. 2, 1947—Continued

Division, State, and City	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												
North Dakota:												
Fargo	0	0	------	0	------	0	0	1	0	0	0	------
Nebraska:												
Omaha	1	0	------	0	------	0	0	4	0	0	0	------
Kansas:												
Topeka	1	0	------	0	------	0	0	0	0	0	0	2
Wichita	0	0	------	0	1	0	2	0	0	0	0	11
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	4	0	3	0	0	0	0	12
Maryland:												
Baltimore	2	0	------	0	5	0	6	0	2	0	2	72
Cumberland	0	0	------	0	------	0	0	1	1	0	0	------
Frederick	0	0	------	0	------	0	1	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	3	0	4	0	6	0	0	16
Virginia:												
Lynchburg	0	0	------	0	3	0	0	0	1	0	1	4
Richmond	0	0	------	0	1	0	0	0	0	0	0	1
Roanoke	0	0	------	0	------	0	0	0	0	0	0	------
West Virginia:												
Charleston	0	0	------	0	1	0	0	0	0	0	0	------
Wheeling	0	0	------	0	------	0	1	0	0	0	1	------
North Carolina:												
Raleigh	0	0	------	0	------	0	1	1	0	0	0	------
Wilmington	3	0	------	0	------	0	0	0	0	0	0	------
South Carolina:												
Charleston	0	0	------	0	1	0	0	0	0	0	0	------
Georgia:												
Atlanta	0	0	------	0	------	0	1	0	2	0	1	2
Brunswick	0	0	------	0	------	0	0	0	0	0	0	12
Savannah	0	0	------	0	------	0	1	0	1	0	0	22
Florida:												
Tampa	0	0	1	0	1	1	3	0	0	0	0	1
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	2	0	------	1	1	0	8	0	1	0	1	6
Nashville	0	0	------	0	------	0	0	0	0	0	0	5
Alabama:												
Birmingham	0	0	1	0	------	0	0	1	1	0	0	3
Mobile	0	0	------	0	------	0	1	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	------	0	0	0	0	0	0	4
Louisiana:												
New Orleans	2	0	1	0	2	0	5	0	3	0	0	1
Shreveport	0	0	------	0	------	0	3	1	0	0	1	------
Oklahoma:												
Oklahoma City	0	0	------	0	------	0	2	0	2	0	0	3
Texas:												
Dallas	0	0	------	0	2	0	2	1	1	0	0	17
Galveston	0	0	------	0	------	0	0	0	0	0	0	------
Houston	1	0	------	0	------	0	5	0	0	0	0	1
San Antonio	0	0	------	0	------	0	2	0	0	0	1	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	2	0	0	0	0	0	0	------
Great Falls	0	0	------	0	1	0	0	0	0	0	0	15
Helena	0	0	------	0	------	0	0	0	0	0	0	------
Missoula	0	0	------	0	------	0	0	0	0	0	0	------
Colorado:												
Denver	2	0	------	0	1	0	5	0	3	0	2	24
Pueblo	0	0	------	0	------	0	0	2	0	0	0	15
Utah:												
Salt Lake City	0	0	------	0	2	0	0	0	2	0	0	3

City reports for week ended Aug. 2, 1947—Continued

Division, State, and City	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	1	0	2	1	3	0	0	14
Spokane	0	0	------	0	1	0	0	2	0	0	0	4
Tacoma	0	0	------	0	1	0	0	0	0	0	0	1
California:												
Los Angeles	0	0	1	0	10	2	2	5	13	0	3	58
Sacramento	4	0	------	0	------	0	3	0	0	0	0	1
San Francisco	1	0	1	0	15	0	2	0	2	0	1	------
Total	41	2	7	4	326	13	194	73	146	0	23	1,177
Corresponding week, 1946*	68	------	4	2	412	------	197	------	154	0	21	733
Average 1942–46*	41	------	18	[2] 5	[3] 429	------	[3] 210	------	197	0	26	913

* Exclusive of Oklahoma City.
[2] 3-year average, 1944–46.
[3] 5-year median, 1942–46.

Dysentery, amebic.—Cases: New York 4; Detroit 2; New Orleans 4; Los Angeles 1.
Dysentery, bacillary.—Cases: Providence 1; Syracuse 1; Detroit 2.
Dysentery, unspecified.—Cases: San Antonio 4.
Rocky Mt. spotted fever.—Cases: Philadelphia 1; Richmond 1.
Tularemia.—Cases: Oklahoma City 1.
Typhus fever, endemic.—Cases: Wichita 1; Atlanta 1; Tampa 1; New Orleans 1; Houston 1; Los Angeles 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (latest available estimated population, 34,257,900)

	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	13.1	0.0	0.0	2.6	76	2.6	28.8	31.4	63	0.0	0.0	162
Middle Atlantic	5.6	0.5	0.9	0.9	54	2.8	27.3	6.9	19	0.0	2.8	160
East North Central	1.8	0.6	0.0	0.0	55	1.8	26.1	14.0	18	0.0	1.2	224
West North Central	8.9	0.0	0.0	0.0	71	0.0	40.1	17.8	13	0.0	2.2	185
South Atlantic	8.4	0.0	1.7	0.0	32	1.7	35.1	3.3	22	0.0	8.4	237
East South Central	11.8	0.0	5.9	5.9	6	0.0	53.1	5.9	12	0.0	5.9	83
West South Central	7.6	0.0	2.5	0.0	10	0.0	48.3	5.1	15	0.0	5.1	69
Mountain	16.5	0.0	0.0	0.0	50	0.0	41.3	16.5	41	0.0	16.5	471
Pacific	7.9	0.0	3.2	0.0	44	3.2	14.2	12.7	28	0.0	6.3	123
Total	6.3	0.3	1.1	0.6	50	2.0	29.6	11.1	22	0.0	3.5	180

PLAGUE INFECTION IN PARK COUNTY, COLO.

Plague infection has been reported proved in pools of fleas from prairie dogs, *Cynomys* sp., taken in Park County, Colo., as follows: Proved positive on July 21—pool of 88 fleas from 47 prairie dogs taken from a ranch 20 miles south of Hartsell; proved positive on July 25—pool of 59 fleas from 28 prairie dogs taken 10 miles east and 5 miles south of Hartsell; proved positive on July 28—pool of 56 fleas from 39 prairie dogs taken 10 miles southwest of Hartsell via Highway No. 24, and pool of 14 fleas from 9 prairie dogs taken 5 miles southeast of Fairplay on State Highway No. 9.

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—5 weeks ended August 2, 1947.—During the 5 weeks ended August 2, 1947, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	11	Syphilis	149
Diphtheria	39	Tetanus	14
Dysentery, unspecified	4	Tetanus, infantile	2
Gonorrhea	195	Tuberculosis (all forms)	833
Influenza	274	Typhoid and paratyphoid fever	17
Malaria	221	Typhus fever (murine)	4
Measles	7	Whooping cough	24

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 recent months. 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.

Cholera

India—Lucknow.—For the week ended July 5, 1947, 120 cases of cholera with 21 deaths were reported in Lucknow, India.

Plague

Egypt—Alexandria.—For the week ended July 19, 1947, 3 cases of plague were reported in Alexandria, Egypt.

Korea.—For the month of April 1947, 22 cases of plague were reported in Korea.

Union of South Africa—Transvaal—Johannesburg.—Information dated July 19, 1947, states that 2 cases of pneumonic plague were reported in the municipal area of Johannesburg, Transvaal, Union of South Africa.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended July 19, 1947.—During the week ended July 19, 1947, 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		10	4	59	148	35	31	30	67	384
Diphtheria		5	1	23	1	1			4	35
Dysentery:										
Bacillary				10						10
Unspecified		5								5
German measles		1		5	6		2	1	5	20
Influenza		36			1					37
Measles		16	2	40	96	76	12	17	27	286
Meningitis, meningococcus		1		2	1	1			1	6
Mumps		8	2	10	84	8	6	8	29	155
Poliomyelitis		1	1	1	3	3	10		14	33
Scarlet fever	3		2	16	23	2	1	1	4	52
Tuberculosis (all forms)		6	32	135	18	103	17	51	62	424
Typhoid and paratyphoid fever				4	1	1	1	1	1	9
Undulant fever				2	3				1	6
Venereal diseases:										
Gonorrhea	1	11	19	107	92	34	17	34	62	377
Syphilis	1	6	9	74	67	7	13	11	17	205
Other forms									6	6
Whooping cough		2		34	65	28		16	34	179

JAMAICA

Notifiable diseases—4 weeks ended June 28, 1947.—During the 4 weeks ended June 28, 1947, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	14	8	Puerperal sepsis		1
Diphtheria	2	1	Tuberculosis (pulmonary)	43	72
Dysentery, unspecified	164	3	Typhoid fever	6	80
Leprosy	1	3	Typhus fever (murine)	3	1

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January-May 1947	June 1947	July 1947—week ended—			
				5	12	19	26
ASIA							
Burma	C	199	35	3		10	
Moulmein	C	53	11				
Rangoon	C		3				
China:							
Formosa (Island of)	C	14					
Hong kong	C		6				
India	C	39,722	9,028				
Bombay	C	[1] 1	[1] 1		4	13	29
Calcutta	C	3,023	720	112		44	46
Cawnpore	C	16	2	1	2		5
Chittagong	C	[2] 9	[2] 5		7		5
Lucknow	C	5	20	120	12	13	
Madras	C	2	1				
India (French)	C	51					1
Indochina (French):							
Cambodia	C	361	233		[3] 79		
Cochinchina	C	368	35		[3] 2		
Bien Hoa	C	6	1				
Cholon	C	31	2				
Giadinh	C	11					
Longxuyen	C	6					
Mytho	C	4	1				
Rachgia	C	19					
Saigon	C	128	5				
Vinh-long	C	7	1				
Laos	C		3				
Tonkin	C	1	1				
Siam (Thailand)	C	2,229	264				
Bangkok	C	698	28	8	18	7	

[1] Imported.
[2] Includes imported cases.
[3] For the period July 1-10, 1947.

PLAGUE

[C indicates cases]

Place		January-May 1947	June 1947	July 5	July 12	July 19	July 26
AFRICA							
Belgian Congo	C	[1] 12					
British East Africa:							
Kenya	C	29	10	1	2		
Uganda	C	1					
Egypt: **Alexandria**	C	2	2	2		3	3
Madagascar	C	[2] 155	10				
Union of South Africa	C	19		1	1	[3] 3	
ASIA							
Burma	C	1,155	19	7	3	9	
Bassein	C	[4] 2					
Mandalay	C	17					
Rangoon	C	12	2				
China:							
Chekiang Province	C	96					
Fukien Province	C	464	33				
Amoy	C	7	5				
Foochow	C	2					
Kiangsi Province	C	104	5				
Nanchang	C	30	5				
Kiangsu Province: **Shanghai**	C	28					
Kwangtung Province	C	49					
Yunnan Province	C	16					

See footnotes at end of table.

Place		January–May 1947	June 1947	July 1947—week ended— 5	12	19	26
ASIA—continued							
India	C	66,102	162				
Indochina (French):							
Annam	C	30	4		[5] 9		
Cochinchina	C	20	6				
Java	C	[6] 36	1				
Korea	C	22					
Palestine	C	1	1	10		4	3
Siam (Thailand)	C	31					
Syria	C	6					
Turkey: Akcakale	C	19					
EUROPE							
Germany: East Prussia.[7]							
Portugal: Azores	C	1				1	
Turkey (see Turkey in Asia).							
SOUTH AMERICA							
Argentina:							
Cordoba Province	C		1				
Santa Fe Province	C	2					
Brazil:							
Ceara State	C	2					
Minas Geraes State	C	7					
Pernambuco State	C	1					
Ecuador:							
Chimborazo Province	C	2					
Loja Province	C	2	3				
Peru:							
Lambayeque Department	C	4					
Libertad Department	C	8					
Lima Department	C	17	1				
Piura Department	C	78					
OCEANIA							
Hawaii Territory: Plague infected rats [8]		1					

[1] Includes 5 cases of pneumonic plague.
[2] Includes 50 cases of pneumonic plague.
[3] Includes 2 cases of pneumonic plague.
[4] Imported.
[5] For the period July 1–10, 1947.
[6] Includes imported cases.
[7] During the month of June 1947, an outbreak of plague with a high mortality occurred in Kon gsburg, East Prussia, Germany.
[8] Plague infection was also reported in Hawaii Territory as follows: On Jan. 9, 1947, in a pool of 31 rats; on Mar. 20, 1947, in a pool of 32 fleas collected from 59 rats.

YELLOW FEVER

[C indicates cases; D, deaths]

SOUTH AMERICA							
Colombia:							
Antioquia Department	C	[1] 3					
Boyaca Department	D	1					
Caldas Department	D	3					
Cundinamarca Department	D	2					
Intendencia of Meta	D	2	2				
Santander Department	D	26	1				
Tolima Department	D	2	1				

[1] Includes 1 fatal case.

SMALLPOX

[C indicates cases; P, present]

Place		January–May 1947	June 1947	July 1947—week ended— 5	12	19	26
AFRICA							
Algeria	C	85					
Angola	C	[1] 13					
Basutoland	C	1					
Bechuanaland	C	17					
Belgian Congo	C	[1] 738	86	52			
British East Africa:							
Kenya	C	289	13	7			
Nyasaland	C	463	98	51	14	41	
Tanganyika	C	915	240	73	[2] 282		
Uganda	C	159	32	7			
Cameroon (French)	C	45	2				
Dahomey	C	73	59				
Egypt	C	404	13	9			
Ethiopia	C	26					
French Equatorial Africa	C	5					
French Guinea	C	266	42				
Gambia	C	5		1			
Gold Coast	C	525	23				
Ivory Coast	C	1,127	450				
Liberia	C	37					
Libya	C	1,762	170	30		21	
Mauritania	C	22					
Morocco (French)	C	54	2				
Morocco (Int. Zone)	C	12					
Morocco (Spanish)	C	26					
Mozambique	C	1					
Nigeria	C	2,424					
Niger Territory	C	1,846					
Portuguese Guinea	C	3					
Rhodesia:							
Northern	C	6	8		6		
Southern	C	296					
Senegal	C	14	1				
Sierra Leone	C	141	2				
Sudan (Anglo-Egyptian)	C	[1] 103	39	18	16	3	
Sudan (French)	C	331	26				
Swaziland	C	10					
Togo (French)	C	85					
Tunisia	C	524	3				
Union of South Africa	C	267	P		P		P
ASIA							
Burma	C	2,453	127	37	17	12	
Ceylon	C	1					
China	C	2,461	221	48	18	18	12
India	C	38,005	4,189				
India (French)	C	10					
India (Portuguese)	C	3					
Indochina (French)	C	1,652	278	64			
Iran	C	44	1			4	
Iraq	C	9	5				
Japan	C	332	34	1	1	4	
Korea	C	125					
Malay States (Federated)	C	2,758	165			38	
Manchuria	C	4					
Siam (Thailand)	C	1,046	42	1			
Straits Settlements	C	97	1				
Syria	C	2					
Turkey (see Turkey in Europe).							
EUROPE							
Belgium	C	[1] 22	[1] 1				
France	C	36	6		3		
Germany	C	12					
Great Britain: England and Wales	C	59	13	2	3		
Greece	C		10				
Italy	C	53					
Luxemburg	C	[1] 1					
Portugal	C	19	4	3			
Spain	C	18					
Turkey	C	3					
NORTH AMERICA							
Guatemala	C	9					
Mexico	C	119					
Panama (Republic)	C			[3] 1			

See footnotes at end of table.

Pace		January–May 1947	June 1947	July 1947—week ended—			
				5	12	19	26
SOUTH AMERICA							
Argentina	C	2					
Brazil	C	[1] 229					
Colombia	C	1,704	533				
Ecuador	C	114	[1] 61				
Paraguay	C	[1] 100					
Peru	C	118	4		5		
Uruguay	C	183					
Venezuela	C	[1] 2,289	[1] 56	[1] 29		[1] 43	[1] 9

[1] Includes alastrim.
[2] Includes delayed reports.
[3] Imported.

TYPHUS FEVER*

[C indicates cases; P, present]

AFRICA							
Algeria	C	113					
Basutoland	C	4	1				
Bechuanaland	C	1					
Belgian Congo	C	206	8	14			
British East Africa:							
Kenya	C	7		1			
Uganda	C	1					
Egypt	C	62	14	4			
Eritrea	C	415	5				
Ethiopia	C	87			9		
French West Africa [1]	C	2					
Gold Coast	C	5					
Libya	C	102	31		4	1	
Morocco (French)	C	95	11		7		
Morocco (International Zone)	C	12	1				
Morocco (Spanish)	C	54					
Nigeria	C	3					
Rhodesia, Southern	C	1					
Sierra Leone	C	1	1				
Tunisia	C	512	104				
Union of South Africa	C	129	P		P		P
ASIA							
Arabia	C	1					
Burma	C	3					
China [2]	C	51	3	2		1	
India	C	7					
Indochina (French)	C	19	8		5		
Iran	C	171	23				
Iraq	C	129	38	14	19	7	
Japan	C	743	126	16	34	18	
Java	C	1					
Korea	C	1,261					
Malay States (Federated) [2]	C	9	33				
Palestine [2]	C	59	4				
Straits Settlements	C	2					
Syria	C	28					
Trans-Jordan	C	12	2	2	1		
Turkey (see Turkey in Europe).							
EUROPE							
Austria [2]	C	5		1			
Bulgaria	C	608	97				
Czechoslovakia	C	24					
France	C	3	1				
Germany	C	16	2		1		
Great Britain: Malta and Gozo [1]	C	5		1			
Greece [2]	C	123	24	5	13		
Hungary	C	522	33	4	3	1	
Italy	C	23					
Sicily	C	19					
Netherlands	C	1					
Poland	C	351	21				
Portugal	C	2					
Rumania	C	13,996	[3] 759				
Spain	C	60	5				
Switzerland [1]	C	4	2				
Turkey	C	378	24	3	1	11	7
Yugoslavia	C	108	24				

See footnotes at end of table.

Place		January–May 1947	Jene 1947	July 1947—week ended—			
				5	12	19	20
NORTH AMERICA							
Costa Rica [1]	C	98	9	1	2	1	
Cuba [1]	C	4					
Guatemala	C	179					
Jamaica [1]	C	15	3			2	
Mexico	C	818					
Panama Canal Zone	C	9					
Panama (Republic)	C	[4] 16					
Puerto Rico [1]	C	20	7		1	2	
SOUTH AMERICA							
Argentina	C	13					
Brazil	C	5					
Chile [3]	C	249					
Colombia	C	792	228				
Ecuador [2]	C	226	36				
Peru	C	380					
Venezuela [2]	C	49					
OCEANIA							
Australia [1]	C	64	8				
Hawaii Territory [1]	C	10	4		2	1	1

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.
[1] Murine type.
[2] Includes murine type.
[3] For the period June 1–7, 1947.
[4] Includes imported cases.

ATOMIC RADIATIONS UNIT

Formation of an Atomic Radiations Unit in the Chemical Section of the Industrial Hygiene Division, United States Public Health Service, was announced by Dr. J. G. Townsend, Chief of the Division. Duncan Holaday, Engineer (R), is in charge of the new unit.

The new unit will advise and assist State industrial hygiene units in detecting and evaluating health hazards produced by the use of radioactive isotopes and high energy machines such as x-ray machines and betatrons.

Radioactive isotopes are used primarily in scientific research. X-rays are increasingly used in industry for the inspection of finished products. Fluoroscopes are fairly commonly used in the citrus fruit, tobacco, and retail shoe industries.

It is believed that institutions and industries are handicapped in their desire to use radioactive isotopes and high energy machines by their lack of information about the safe handling of dangerous quantities of radioactive materials. The new Atomic Radiations Unit, working through industrial units in the States will help institutions and industries evaluate their hazards and establish safe working conditions.