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A TECHNIQUE FOR STAINING, DISSECTING, AND MOUNTING THE MALE TERMINALIA OF MOSQUITOES [1]

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The classification of mosquitoes is based to a large extent on the characters of the sexual appendages of the male adult, which are collectively known as the terminalia. In a number of groups, notably the genera *Anopheles* and *Culex*, certain minute though definite differences in these structures have proved so far to be the only available characteristics for the separation of a number of closely related species. From a practical standpoint, the study of the male terminalia has become of prime importance in connection with the anopheline vectors of malaria. With increasing knowledge of the problems involved, it has become evident that the older methods of mounting mosquito terminalia do not yield suitable material for the critical analysis of minute differences, which is now known to be necessary.

Among certain medically important groups in the genus *Anopheles*, for example, the shape of the male generative organ, the mesosome, and of the claspette lobes, which lie behind the mesosome, is of paramount importance in the ultimate identification of species. In the usual whole mount of the male terminalia these parts are covered by the anal lobe, a large hood-like structure, which often obscures the view of the more characteristic parts. In some species only the presence or absence of very small lateral spines on the mesosome, called leaflets, separates one species from another. These leaflets are usually invisible if covered by the anal lobe, and often must be stained to make them visible.

The usual method of preparing the terminalia for study involves maceration of the whole terminalia in weak alkali, dehydration, clearing, and mounting in balsam on a 1 x 3 inch glass slide. This method gives specimens in which many of the characteristic structures are obscured by the parts which lie over them. Some method of staining and dissecting these parts, to render their minute details more easily seen, is required for the recognition and separation of closely related species. It is often desirable to examine both sides of the terminalia under high magnification, but if they are mounted on

[1] From the Gorgas Memorial Laboratory, Panama, Republic of Panama.

the ordinary 1 x 3 inch glass slide only the upper side can be examined, as the working distance of a high-power objective is usually much less than the thickness of the slide. Some method of mounting the terminalia which will permit the examination of both sides of the parts is therefore an advantage.

The technique given below, in part devised by the author and in part adapted from other workers, is a combination of staining, microdissection and special mounting, which renders all parts of the male terminalia visible on both sides and permits accurate drawing or photographing of the component structures.

STAINING

Staining is done as one of the steps in preparing the material for dissection. These steps, including the staining, are as follows:

1. Under the low power of the dissecting microscope, cut off the tip of the abdomen, including the terminalia, with a small needle sharpened at one side to a knife-edge.

2. Place the severed portion in a drop of absolute ethyl alcohol in a small glass cell. The alcohol allows the immediate wetting of the specimen by the alkali used in step 3.

3. Cover with 20 percent sodium hydroxide (NaOH) solution in distilled water and let stand for 12 hours.

4. Remove alkali from cell with capillary pipette and replace with acetic alcohol (3 parts of 50 percent ethyl alcohol, 1 part acetic acid). Leave in acetic alcohol for 15 minutes.

5. Remove acetic alcohol with another capillary pipette and replace with Gage's stain, diluted 1 to 5 with distilled water. Gage's stain (*1*) has the following formula:

Acid fuchsin	0.5 gram
10 percent hydrochloric acid	25.0 cc.
(Add 10 cc. of concentrated HCl (sp. gr. 1.18) to 90 cc. distilled water.)	
Distilled water	300.0 cc.

Place one drop of this stock solution of stain in the glass cell and add five drops of distilled water. Allow to remain for 12 hours.

6. Remove stain from glass cell with capillary pipette and replace with 95 percent ethyl alcohol. Let stand for 5 minutes.

7. Remove 95 percent alcohol and replace with absolute ethyl alcohol. Let stand for 15 minutes.

8. Remove absolute alcohol and replace with clove oil. The specimen may remain in the clove oil until thoroughly cleared, or it may be left for a longer time, as the stain does not fade if the oil is fresh. Long immersion in the oil makes the specimen brittle, which is sometimes an advantage. The specimen is now ready for dissection.

PREPARATION OF DISSECTING NEEDLES

No needles fine enough to dissect the minute structures of the male terminalia are obtainable commercially. Even the small "minuten nadeln" used for double mounts of small insects are much too coarse for the purpose. It has been found impossible to grind needle points to the required fineness by using a flat stone and manual grinding; the point breaks long before such fineness is reached. Mechanical grinding, using a small high-speed motor and a special grinding wheel, will give the necessary fineness.

No. 0 stainless steel insect-pins are the crude stock from which the fine needles are made. A pin is stuck into the tip of an ordinary wooden applicator, a thin stick of wood 6½ inches long and about one-sixteenth of an inch in diameter. The pin is driven well into the wood, using forceps to press it in, and the head end is cut off, leaving about an inch projecting from the end of the applicator. The grinding apparatus is a special stone, mounted on a small high-speed motor. Three coarse stones are sold with this motor, and may be used for the preliminary rough shaping of the needle. The special stone used for the final grinding is made to standard dimensions, of a composition used commercially in grinding safety-razor blades. The motor with the stone is held in the left hand, and the applicator with the needle inserted is held in the right hand. Grinding is done under visual control under the low power of the binocular dissecting microscope (fig. 1). Two opposite sides of the needle are ground first, making a long thin blade; the other two sides are then ground, making a fine point with a cutting edge. Considerable practice is necessary before a good point can be made. However, points half the thickness of a human hair can eventually be made without difficulty. It is well to make a number of needles at the same time so that dissecting need not be interrupted if one needle breaks.

DISSECTION

The stained and cleared terminalia are placed in a very small amount of clove oil in the depression of a hollow-ground slide. It is better to cut off one end of the slide, just beyond the depression, and orient it so that the long end points away from the operator. This is done so that the slide will not be touched and accidentally moved by the mounds of plasticine used to steady the needles during dissection. Two applicators with the prepared needles are imbedded in the tops of two mounds of plasticine (modeling clay). These mounds should weigh about 35 grams each, are roughly pyramidal, and about one inch in height. The applicators are set in the plasticine at an angle of about 30 degrees from the horizontal. The points of the needles are brought close together in the field of the microscope. The left-

hand needle is used to hold the specimen down on the slide, and the right-hand needle cuts and dissects out the parts of the terminalia. The arrangement of applicators and plasticine mounds is shown in figure 2.

Detailed instructions on the dissection procedure cannot be given here, as the procedure varies with the arrangement of the parts of the terminalia of the species being dissected. However, in *Anopheles* it is best to remove the ninth tergite and the anal lobe first, and then the mesosome, leaving the claspette lobes until the last. Considerable practice is required to make a perfect dissection so that all the parts are unbroken. However, no worthwhile technique requiring a considerable degree of muscular coordination can be acquired in a day.

It is well to examine the parts while they are still in clove oil so that various aspects may be brought into view by moving the parts about with a needle. Drawings of the parts in various aspects can now be made, using a compound microscope with a 20× objective and a 10× eyepiece. The part to be studied should be stranded in the edge of the drop of clove oil to avoid motion from currents in the oil.

MOUNTING

After dissection the parts are removed to the slide on which they are to be permanently mounted. The usual 1 x 3 inch glass slide may be used, but this allows only the upper side of the specimen to be viewed with a high-power objective, as the thickness of the glass slide is greater than the working distance of such an objective.

The special slides designed by the writer are a modification of the Cobb slide (*3*). They are made from 1 x 3 inch (25 x 75 mm.) aluminum blanks, 1.5 mm. in thickness, with a central circular hole 13 mm. in diameter; concentric with this hole is a shoulder 17 mm. in diameter and 0.3 mm. deep. An ordinary No. 1 circular cover-glass 15 mm. in diameter is cemented to the shoulder, covering the hole, using any one of a number of commercial cements, such as "Duco." The cement should be thinned with acetone and liberally applied to the shoulder of the slide with a small brush. The cover-glass is set into the cement immediately, before it has a chance to dry.

The various separate parts of the terminalia should be arranged in a systematic order on the slide. It is well to follow the order in which the parts occur in the undissected terminalia; the two side pieces are placed nearest 12 o'clock on the cover-glass; immediately beneath is the mesosome, then the claspette lobes, and, nearest 6 o'clock, the ninth tergite and anal lobe. Small drops of balsam, one for each part to be mounted, are placed on the lower cover-glass which has been affixed to the aluminum slide. These small drops are applied from the point of a capillary pipette which can be made by drawing out in a flame the

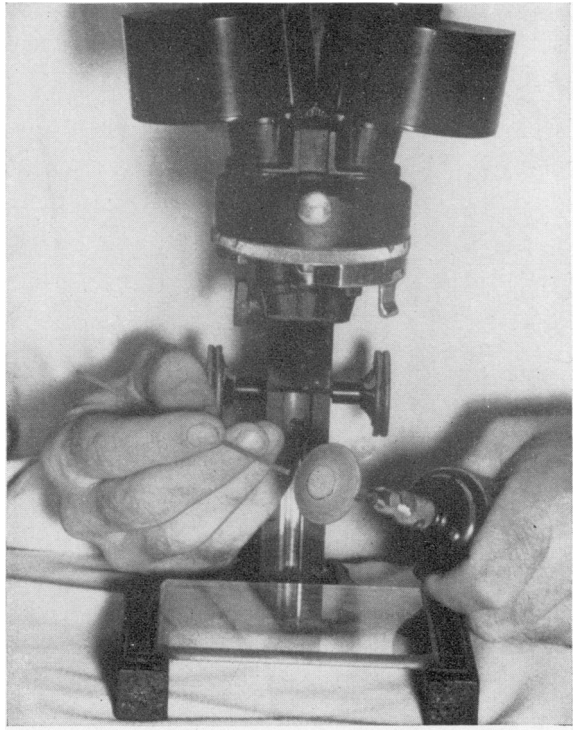

FIGURE 1.—Needle in applicator being sharpened against stone mounted on small electric motor, under visual control.

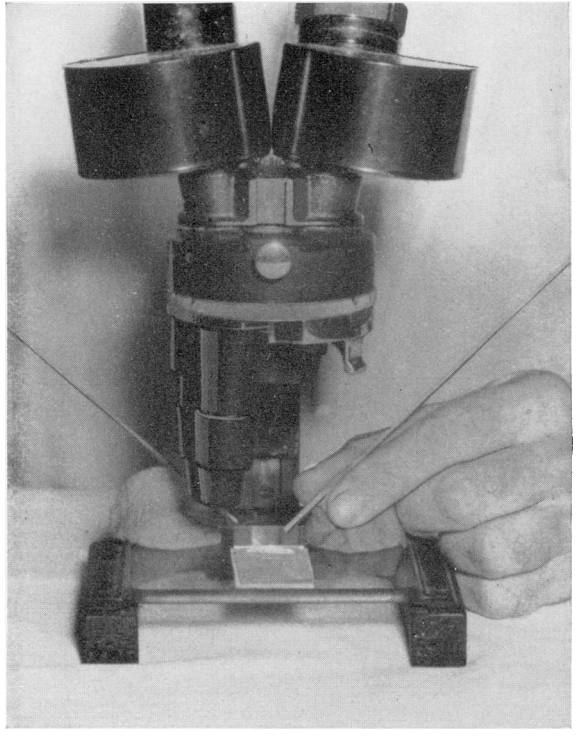

FIGURE 2.—Method of supporting dissecting needles in mounds of modeling clay. Note position of hollow-ground slides.

end of a pipette from a dropping bottle provided with a ground-in pipette. The balsam, which should be rather thin, is kept at a level in the dropping-bottle such that the fine tip of the pipette barely reaches below the surface. Using the rubber bulb of the pipette, the drops are carefully squeezed out onto the lower cover-glass under visual observation under the low power of the dissecting microscope. The separated pieces of the terminalia are picked up on the end of a needle, and each is transferred to one of the balsam drops. All this is done, of course, under the dissecting microscope. To make the transfer easy, the slide containing the parts in clove oil is placed parallel to the slide to which the parts are to be transferred, so that, using the left hand, both may be moved back and forth as a unit under the microscope.

After the parts have been transferred to the balsam drops and properly oriented, the slide is put away in a dust-proof box for a week or more. This allows the balsam to harden so that the parts imbedded in it cannot move about when the upper cover-glass is placed over them. At the end of this time a small drop of balsam is placed in the middle of a 12 mm. round cover-glass and inverted over the lower cover-glass. Just enough balsam should be used to spread evenly to the edges of the upper cover-glass. Both sides of the specimen may now be examined with the oil-immersion objective, since the material is covered on each side only by the thickness of a cover-glass.

The preparation may be labeled by scratching the data on the aluminum slide with a diamond pencil or the conventional gummed paper label may be used.

ILLUMINATION

The smallness of the parts to be dissected requires high illumination of the microscope field. The writer has used a Spencer Universal Microscope Lamp, No. 358, in his work, and finds it satisfactory if suitably adjusted. The lamp bulb must be drawn back as far as possible in the sleeve, so that the intensely brilliant image of the lamp filament is thrown on the field. The Nicholas Illuminator of Bausch & Lomb can also be used if the tube containing the lower lens is suitably lengthened so that an image of the filament may be obtained. A makeshift lamp, which may be very useful in the field, can be made from a two-cell focusing flashlight, focused so that the light is concentrated on the field, and supported on a stiff bent wire stand.

THE MICROSCOPE

Almost any type of binocular dissecting microscope capable of giving a wide field and a magnification of from 60 to 80 diameters may be used for dissection. The base of the microscope which carries the illuminating mirror must be removable, as the glass plate forming the stage of the microscope must rest on the table on a level with the operator's hands. Some method of changing quickly from low to high

power is convenient, but not absolutely necessary. Eyepieces giving a magnification of 9× and objectives giving a magnification of 6.8×, a total magnification of about 60 diameters, are used for the actual dissection, and a magnification of about 10 diameters is used for grinding the needles and putting the drops of balsam on the slide.

A good binocular compound microscope is a necessity for the examination of the parts of the terminalia after they have been mounted under the cover glass. A useful combination is a 20× objective and a 7.5× or 10× ocular, but to show fine detail higher powers must be used.

Paired eye caps with perforated diaphragms are useful in obtaining a stereoscopic image. A simple expedient, giving the same effect as the eye caps, is to cut from thin black paper a circular disc which has the same diameter as the ocular. This disc is cut in half, and the halves are stuck lightly to the oculars so that the inner halves of each are covered, the straight edges of the half discs being vertical. By moving the lightly adhering half discs toward and away from each other a position will be found where an excellent stereoscopic image is obtained. The half discs are then glued securely to the oculars. A stereoscopic image is very useful in determining whether a certain part is below or above another part when making descriptions or drawings.

APPLICATIONS OF THE METHODS TO OTHER OBJECTS

The methods outlined above are applicable to other objects besides the terminalia of mosquitoes. Anyone working with insect genitalia which require dissection for proper demonstration will find the method of grinding the needles and supporting them during dissection of great assistance.

The methods described here have been taught to two coworkers who now make creditable preparations; the technique apparently does not require any special aptitude, although facility cannot be gained in a day. Dissection requires considerable patience and practice but the results are worth the time and effort expended.

One example of the advantages of dissection as applied to mosquito terminalia is the demonstration of the striking differences between two anopheline species found in the Caribbean region, *A. neivai* and *A. bellator*. Regarding the terminalia of these, Root (*4*) states: "The genitalia of these two species [*bellator* and *hylephilus* (=*neivai*)] agree in every detail with those of *A. neivai*, so far as I could see." The writer (*5*) has shown that the mesosome of *A. neivai* is without leaflets, while that of *A. bellator* has two very large reflexed leaflets, somewhat closely appressed to the mesosome, but easily visible when stained and dissected. The microphotographic illustrations in his article (*5*) are examples of the possibilities of the method in clearing up the specific identities of closely related species and in illustrating these differences by photography, thereby eliminating the personal equation inherent in entomological drawings.

SUMMARY

Methods of staining, dissecting, and mounting the male terminalia of mosquitoes are described. Procedure for preparing the material, a description of the method and apparatus used in grinding needles, the technique of dissecting, and a description of the modified slide-mount used, are given. The methods outlined give preparations which show both sides of the well-stained, dissected specimen, and which permit a thorough study of the parts to be made. Such preparations are superior to mounts made without dissection, in which some of the characteristic structures may be obscured by other parts which overlie them.

ACKNOWLEDGMENTS

The writer is indebted to Dr. Harold Morrison of the Bureau of Entomology, United States Department of Agriculture, Washington, D. C., for calling his attention to Gage's stain; to Dr. Robert Chambers, Professor of Experimental Biology, New York University, for the method of using plasticine for steadying needles while dissecting; and to Mr. Gerald Thorne, Nematologist of the Bureau of Plant Industry, United States Department of Agriculture, Washington, D. C., for acquainting him with the original Cobb slide.

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DATA ON THE CONCURRENCE OF DEATH FROM TUBERCULOSIS, INFLUENZA AND PNEUMONIA, CANCER, AND HEART DISEASES AMONG HUSBANDS AND WIVES [1]

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INTRODUCTION

Recently the writer (*1*, *2*) reported that apparently there is a tendency for husbands and wives to die from the same cause when one of

[1] From the Division of Public Health Methods, National Institute of Health. This is the sixth of a series of papers on the biological factors in public health. Previous articles are:
The trend of the age of marriage in Washington County, Md., from 1897 to 1938. Human Biology, 12: 59–76 (1940).
The trend in the proportional contribution of the socio-economic groups to natality. A report based on the births in Washington County, Md., from 1898 to 1938. Human Biology, 12: 188–202 (1940).
On the mortality in husbands and wives. Human Biology, 12: 508–531 (1940).
Parity order of birth, age of mother, and socio-economic status. Human Biology, 13: 64–81 (1941).
On the mortality in brother-sister and husband-wife pairings. Human Biology, 13: 189–202 (1941).

the spouses has died from tuberculosis, influenza and pneumonia, cancer, or heart disease. These findings resulted from an analysis of the death records of 2,571 white married couples, both the husband and the wife having died in Washington County, Md., between 1898 and 1938. The concurrence of tuberculosis morbidity and mortality among husbands and wives has long been demonstrated. That such a relationship exists also with reference to influenza and pneumonia mortality might have been assumed because of the infectious nature of these diseases. However, with reference to heart diseases and cancer the association was not expected. Many inferences could be drawn from these findings, and if the results are correct it would seem that important leads for future investigations could be uncovered. Therefore, it has appeared worth while to extend the investigation on the mortality of spouses by analysing other and different kinds of data about the causes of death among husbands and wives. The findings obtained from the analysis of a second sample will be presented in this paper and compared with those published.

MATERIAL

The data on which this analysis is based are derived from records collected by Dr. Raymond Pearl [2] shortly before his death. These records consist of (*a*) copies of the death certificates of a sample of white male life insurance policyholders who died between 1937 and 1940, and (*b*) transcriptions of the medical examination and family history obtained on these persons at the time of application for the insurance. From these records, which number over 10,000, those utilized for this study concern the ones wherein at the time of application both parents of the policyholder were stated to be dead and the causes of their deaths were given specifically, i. e.: not expressed in uncertain and vague terms. The records of 2,346 policyholders, referring to 2,346 parental couples, satisfy these criteria and form the material for this analysis.

It is obvious that, because of its origin and the method of selection, this sample of couples has characteristics which differentiate it from the general population. These characteristics have been described in some detail elsewhere by the writer (*3*). Here it is pertinent to note how this sample differs from that originating from the mortality records certified in Washington County, Md. For the sake of convenience the latter will be called the W. C. D. C. (Washington County death certificates) series and the former the I. A. (insurance applications) series. The major differences between the two samples are:

1. The W. C. D. C. series originates from one small section of the country; the I. A. series originates from all parts of the country.

[2] The author wishes here to express his thanks to Prof. L. J. Reed, of the Johns Hopkins School of Hygiene and Public Health, for the privilege of making this use of the records, and to Mr. J. F. Kish for the assistance generously given.

2. In collecting the W. C. D. C. sample, the reproductive history of the couples or the status of the offspring were not considered. These elements were, however, important in the selection of the I. A. series, where couples are represented because they had at least one male offspring and this offspring was of age (after the death of the parents) to be financially and physically able to obtain life insurance.

3. In the case of the W. C. D. C. series the cause of death was stated by a physician; for the I. A. series the information on the cause of death was acquired through the offspring.

These differences between the two samples are here emphasized to bring out how divergent in kind they are. Thus, if the association between husbands and wives with reference to the causes of death mentioned is due to some condition inherent in sampling it would seem improbable that the same condition should be present in two series of such a dissimilar nature.

The divergences in the sampling are reflected in the age at death and cause of death of the individuals of the two series. The mean age at death of the husbands of the W. C. D. C. series is 68.8 ± 0.26 years; of the wives it is 68.1 ± 0.29 years. For the husbands of the I. A. series the mean age at death is 61.9 ± 0.18 years, while for the wives it is 57.4 ± 0.20 years. On the average the I. A. series is younger than the W. C. D. C. series, a finding which is explainable by the selective procedure employed.

The frequency of deaths from the four groups of causes in the two series is presented in table 1.

TABLE 1.—*Frequency of stated causes of death in two series of white husbands and wives*

Cause of death	International list numbers (1929 revision)[1]	W. C. D. C. series				I. A. series			
		Husbands		Wives		Husbands		Wives	
		Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Tuberculosis (all forms)	23–32	117	4.55	163	6.34	78	3.32	105	4.48
Influenza and pneumonia (all forms)	11, 107–109	180	7.00	222	8.63	418	17.82	413	17.60
Heart diseases	90–95	614	23.88	681	26.49	273	11.64	266	11.34
Cancer and other malignant tumors	45–53	187	7.27	274	10.66	105	4.48	178	7.59
Other causes		1,473	57.30	1,231	47.88	1,472	62.74	1,384	58.99
All deaths		2,571	100.00	2,571	100.00	2,346	100.00	2,346	100.00

[1] In coding the causes of death for the I. A. series the 1938 revision was actually employed.

In table 1 the dissimilarity of the two samples is brought out in a striking manner. In particular, one notes that among the husbands and wives of the I. A. series the percentage of deaths due to influenza and pneumonia is higher while the frequency of heart diseases as a cause of death is lower than in the other series. The younger age of the I. A. subjects may account for some of the observed dissimilarity, but

other factors may also be postulated. For example, it is known that tuberculosis and rheumatic heart disease are familial conditions and consequently offspring of parents dying from these causes are probably not represented among the insurance applicants as often as would be expected in the general population. In any event, whatever the final explanation of the differences between the two series may be, it is desired at the moment only to point out that such differences exist.

TUBERCULOSIS MORTALITY AMONG HUSBANDS AND WIVES

TABLE 2.—*Concurrence of tuberculosis mortality among spouses*

Cause of death	Number		Percent of spouses who died from tuberculosis	
	W. C. D. C. series	I. A. series	W. C. D. C. series	I. A. series
Husbands:				
Tuberculosis	117	78	17.1±3.6	24.4±4.9
Other causes	2,454	2,268	5.8± .5	3.8± .4
Wives:				
Tuberculosis	163	105	12.3±2.6	18.1±3.8
Other causes	2,408	2,241	4.0± .4	2.6± .4

In table 2 are presented the figures relative to the frequency of tuberculosis as a cause of death among the spouses of persons who died and of persons who did not die from this disease. The essential feature of the data given in the table is the high rate of tuberculosis mortality among the spouses of persons who died from the disease in comparison with the rate among the spouses of the persons who died from other causes. In the W. C. D. C. series 17.1 percent of the wives of men who died from tuberculosis also died from this cause; in the I. A. series this percentage is 24.4. Among the wives of men who died from causes other than tuberculosis the percentage that died from tuberculosis is 5.8 in the W. C. D. C. series and 3.8 in the I. A. series. With reference to the tuberculosis mortality among the husbands of women who died from tuberculosis and among the husbands of women who died from other causes, a picture similar to the above is obtained. Thus, for the W. C. D. C. series it appears that when wives died from tuberculosis the frequency of tuberculosis mortality of their husbands was three times as high as the rate of tuberculosis mortality among the spouses of women who died from causes other than tuberculosis. For the I. A. series it was about six times as high. In both series this concurrence of tuberculosis mortality among the spouses is statistically significant whether measured by the chi-square test or by the differences between the percentages. The findings in the two samples are therefore in accordance and agree with many observations reported in the literature. In view of this

agreement some assurance is acquired that the characteristics of the two samples are not of a nature to alter results that long experience has shown to be expected.

INFLUENZA AND PNEUMONIA MORTALITY AMONG HUSBANDS AND WIVES

TABLE 3.—*Concurrence of mortality from influenza and pneumonia among spouses*

Cause of death	Number		Percent of spouses who died from influenza and pneumonia	
	W. C. D. C. series	I. A. series	W. C. D. C. series	I. A. series
Husbands:				
Influenza and pneumonia	180	418	15.0±2.7	22.5±2.0
Other causes	2,391	1,928	8.2± .6	16.6± .8
Wives:				
Influenza and pneumonia	222	413	12.2±2.2	22.8±2.1
Other causes	2,349	1,933	6.5± .5	16.8± .9

For influenza and pneumonia mortality, the data of table 3 indicate that the same relations are to be observed for the I. A. series as were noted for the W. C. D. C. series, even though the actual prevalence of deaths from these diseases differs considerably in the two samples. Among the wives of men of the I. A. series who died from influenza and pneumonia 22.5 percent also died from the same cause but only 16.6 percent of the wives of men who died from other causes died from influenza and pneumonia. The difference between the two percentages is statistically significant in terms of its standard error. The same is true when the rate of influenza and pneumonia mortality among the husbands of women who died from these diseases is compared with that of the husbands of women who died from other causes; the percentages being, respectively, 22.8 and 16.8. Hence, among the spouses of persons who died from the diseases under discussion the frequency of mortality from the same diseases is 1.4 times as high as the frequency of mortality from influenza and pneumonia among the spouses of persons who died from other causes. This ratio is only slightly lower than that noted for the W. C. D. C. series, which is 1.8. No information is available for the I. A. series regarding the time elapsed between the death of the two marital partners both of whom died from influenza and pneumonia; however, for the W. C. D. C. series the average interval is about 9 years. Therefore, while it might have been expected that influenza and pneumonia occur with higher frequency in marital partners because of direct contagion, the findings reported here are somewhat unusual, at least for the W. C. D. C. series, in view of the long interval of time between the deaths of the husband and wife.

CANCER MORTALITY AMONG HUSBANDS AND WIVES

TABLE 4.—*Concurrence of cancer mortality among spouses*

Cause of death	Number		Percent of spouses who died from cancer	
	W. C. D. C. series	I. A. series	W. C. D. C. series	I. A. series
Husbands:				
Cancer	187	105	15.5±2.7	14.3±3.4
Other causes	2,384	2,241	10.3± .6	7.3± .6
Wives:				
Cancer	274	178	10.6±1.9	8.4±2.1
Other causes	2,297	2,166	6.9± .5	4.2± .4

The findings from the W. C. D. C. series with reference to the concurrence of cancer mortality among husbands and wives are very interesting. As the data of table 4 clearly show, a similar association is present for the I. A. series. In the latter series, among the wives of men who died from cancer 14.3 percent died from the same cause, while among the wives of men who died from diseases other than cancer only 7.8 percent died from cancer. For husbands of women who died from cancer and husbands of women who died from other causes the relative frequency of cancer mortality is 8.4 and 4.2 percent, respectively. For each sex the difference in the relative frequency of cancer between the spouses of persons who died from this cause and of persons who died from other causes is probably significant from a statistical standpoint. Moreover, a chi-square test indicates that more couples are observed both of whom died from cancer than would be expected on the basis of chance assortment of men and women who died from cancer in the sample. According to the findings from the W. C. D. C. series, the chances of a spouse dying from cancer are 1.5 times greater if the other spouse has died from cancer than if the other spouse has died from other causes. Almost the same ratio, 1.8, is revealed by the I. A. series. From the results observed in these two series there would be some justification to conclude that when one spouse dies from cancer the other is more likely to die from the same cause than the spouse of a person who dies from causes other than cancer.

HEART DISEASES MORTALITY AMONG HUSBANDS AND WIVES

The data in table 5 show that the situation with regard to heart disease mortality differs in the two series. In the I. A. series, among the spouses of persons who died from heart diseases the percentage of those who died from the same diseases is slightly, although insignificantly, lower than that of the spouses of persons who died from other causes. Without other information about the kind of heart involvement that caused the deaths of the individuals in the two samples, it

is difficult to explain the reason for the dissimilarity between the series. In discussing the findings of the W. C. D. C. series the writer pointed out that if it is assumed that rheumatic heart disease has an infectious origin the concurrence of mortality from heart diseases among husbands and wives might be explained on those grounds. If this were so, and if it were assumed that the low prevalence of heart disease mortality in the I. A. sample is also due to a selection against rheumatic heart disease, the negative results of the I. A. sample with respect to heart diseases could be understood. However, other factors may enter into the picture and it seems unwise to speculate without more pertinent knowledge.

TABLE 5.—*Concurrence of heart diseases mortality among spouses*

Cause of death	Number		Percent of spouses who died from heart diseases	
	W. C. D. C. series	I. A. series	W. C. D. C. series	I. A. series
Husbands:				
Heart diseases	614	273	30.0±1.8	10.6±1.9
Other causes	1,957	2,173	25.4± .1	11.4± .7
Wives:				
Heart diseases	681	266	27.0±1.7	10.9±1.9
Other causes	1,890	2,080	22.8± .1	11.7± .7

DISCUSSION

The main finding which emerges from this study is that two samples of independent and noticeably different kinds of records on the causes of death of husbands and wives indicate a marital concurrence of mortality from tuberculosis, influenza and pneumonia, and cancer. The two series, however, disagree with regard to the prevalence of deaths from heart diseases among husbands and wives. For the latter diseases the unexpected association found in the first sample is not present in the second. A satisfactory explanation of this discrepancy cannot be advanced without more complete information about the clinical types of heart involvement that caused the deaths. So, for the time being, the question of marital concurrence of heart diseases remains uncertain, although it may be remarked that in the second series an abnormally low percentage of deaths from heart diseases was observed, besides the absence of any association between husbands and wives.

As has been repeatedly stated, the results concerning the marital concurrence of tuberculosis mortality are in agreement with the findings reported by other investigators. The majority of these infer that the association is a consequence of contagion from one to the other partner. Although other factors may also be postulated it seems safe to accept this inference. So far as the present results are concerned, it is particularly gratifying to be able to point out that,

although the two series of records which constitute the material of this inquiry differ not only from each other but also from the data on which the investigations of others have been based, all lead to the same conclusion.

The findings with respect to influenza and pneumonia cannot be explained as easily as those on tuberculosis. The acute nature of the diseases and the long interval between the deaths of the two marital partners (known for one series and suspected for the other) seems to preclude the element of direct contagion from one to the other partner. Other conditions must play a part in the association observed, such as source of infection, persistence of parasites, immediate environment, or assortative mating with reference to biological constitution.

It is, however, with respect to cancer that the observations reported assume special interest. Although the possibility of some hidden statistical artefact cannot be entirely excluded, it is noted that two sizable and independent samples differing in many characteristics lead to almost identical results. A possible inference that could be drawn is that some condition of the particular environment shared by a husband and wife probably is important in the etiology of the disease.

The findings of this and the previous study justify certain general considerations pertinent to a delineation of public health methodology. In the first place, the utility of studying morbidity or mortality in terms of the familial aggregate becomes clearly apparent, as it has been to both geneticists and epidemiologists. Even though this approach to the study of public health problems has not yet been specifically formulated, nevertheless in practice it is followed, and probably a good deal of credit for the reduction of tuberculosis mortality must be given to the procedure of directing observations on the families of tuberculous individuals. How necessary such a procedure is may be inferred from the data reported in these and other inquiries on tuberculosis among husbands and wives. But, if the findings reported here describe a true phenomenon, it would seem that for other conditions besides tuberculosis further reduction in the prevalence or incidence rate could be expected if attention were focussed not only on the sick person but on his family as well. By studying the familial aggregate it will also be possible to identify more precisely those pathologic conditions for which the variations in the innate biological constitution are an important factor. In this way it will also become possible to identify those pathologic conditions in the etiology of which the innate biological constitution is important. For example, evidence has recently been presented (*3*) showing that the chances of death from cardiovascular diseases increase in order according to whether none, one, or both of the parents have died from these diseases. From the standpoint of public health

this means that a positive family history in an apparently healthy person is a sign demanding the provision of whatever preventive measures are appropriate.

The study of morbidity and mortality among husbands and wives, since it concerns persons who live in intimate contact but generally are not related, constitutes an important phase of the investigation of diseases from the standpoint of the family group. It is apparent, as has been pointed out (*4*), that data on marital couples serve for purposes of comparison with similar data on siblings. Through such comparison an evaluation may be made of the action of the same genetic background and childhood environment but a different adult environment, on the one hand, with that of the same adult environment but a different genetic background and childhood environment on the other hand. Furthermore, the study of husbands and wives offers the special opportunity of distinguishing the elements of the immediate environment which enter into the etiology of disease and, when the prime etiologic factor is obscure, of clarifying it. This value of the method has been appreciated by a few, noteworthy being Moore and Kemp (*5*), who sought to determine by this the existence of a neurotropic strain of *Spirochaeta pallida*. The possibilities of this method of approach are far reaching. When one considers the results of the analysis discussed here with respect to influenza and pneumonia and cancer there seems to be good evidence that, if the marital concurrence noted is found to be universal, then a thorough inquiry into the modalities by which it comes about would contribute greatly toward further knowledge of the epidemiology of the diseases.

SUMMARY

The frequency with which the spouses of persons who died from either tuberculosis, influenza and pneumonia, cancer, or heart diseases have died from the same cause has been examined for 2,346 white married couples, the parents of an equal number of male life insurance policyholders. A comparison has also been made between the findings on this series and those reported previously from the study of 2,571 couples who died in Washington County, Md.

The results of this inquiry reveal:

1. In both series the relative number of persons who died from the same cause as the spouse is significantly higher when the spouses died from tuberculosis, influenza and pneumonia, and cancer, respectively, than when the spouses died from other causes.

2. In the case of tuberculosis the percentage that died from this cause is three to six times as high among the spouses of persons who died from tuberculosis as among the spouses of persons who died from other causes.

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3. With respect to influenza and pneumonia the relative number of deaths from these causes is 1.4 to 1.8 times as high among the spouses of persons who died from these diseases as among the spouses of persons who died from other causes.

4. The percentage of cancer deaths is 1.5 to 1.8 times as high among the spouses of persons who died from cancer as among the spouses of persons who died from causes other than cancer.

5. The new series of data does not corroborate the marital association regarding mortality from heart diseases as observed previously for the series based on the death records of Washington County, Md.

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ADDITIONAL HIGHLY VIRULENT STRAINS OF ROCKY MOUNTAIN SPOTTED FEVER VIRUS ISOLATED IN GEORGIA [1]

By GEORGE D. BRIGHAM, *Associate Bacteriologist*, and JAMES WATT, *Passed Assistant Surgeon, United States Public Health Service*

Highly virulent strains of Rocky Mountain spotted fever virus were recovered in the East in 1939 by Topping and Dyer (*1*) and Brigham and Watt (*2*).

We can now report the recovery in Georgia of four more highly virulent strains of Rocky Mountain spotted fever virus.

During the summer of 1940, we were advised of a case of spotted fever which terminated in the death of the patient, a 9-year-old boy, on the thirteenth day of illness. Blood taken the day before death agglutinated Proteus OX–19 in 1:1280 dilution. The child had a history of tick bite a few days prior to onset. Ticks were collected from various animals present on the farm and two strains of the infectious agent were isolated. One strain, 308, was recovered from a pool of 20 partially engorged female ticks (*D. variabilis*). The other strain, maintained for a few transfers only, was recovered from a pool of 27 male ticks (*D. variabilis*).

One human strain (249) was isolated from the blood of a 3-year-old child. It was obtained on the tenth day of illness and the Weil-

[1] From the Typhus Research Laboratory, Savannah, Ga., Division of Infectious Diseases, National Institute of Health.

Felix reaction at this time gave complete agglutination with Proteus OX–19 in the 640 dilution.

The other human strain (393) was recovered from the blood of a 10½-month-old girl on approximately the thirteenth day of illness. The date of onset could not be definitely determined in this case. The Weil-Felix reaction on this date was negative and a test made 21 days later was also negative. The child recovered completely.

Only the three strains T308, H249, and H393 were maintained and studied; they were compared with the previously isolated highly virulent tick strain T125. The involvement of the scrotum was noted in one of the guinea pigs originally inoculated with the tick strains, while scrotum reactions developed in the second passage guinea pigs inoculated with the human strains. The scrotal reaction has been observed in all subsequent passages.

The strains were shown to be Rocky Mountain spotted fever virus by the clinical picture in guinea pigs and by cross immunity tests with the tick strain T125. Typical lesions associated with Rocky Mountain spotted fever were found in the brains of several guinea pigs by Senior Surgeon R. D. Lillie.

The clinical picture of the routine passage animals used in the maintenance of the 1939 highly virulent tick strain T125 and the 1940 isolations is summarized in table 1.

TABLE 1

Strain	Isolated	Number of guinea pigs	Average incubation period (days)	Scrotal reactions	Fatality	
					Number	Percent
Human 393	Georgia 1940	42	2.00	39	31	73.8
Human 249	do	83	2.27	76	58	69.9
Tick 308	do	49	1.94	47	35	71.4
Tick 125	Georgia 1939	132	2.09	122	93	70.4

SUMMARY

Strains of Rocky Mountain spotted fever virus were isolated from ticks (*D. variabilis*) and humans in Georgia in 1940. They were found to be as highly virulent as previously isolated tick strains.

ACKNOWLEDGMENT

We are indebted to the following physicians of Georgia for assistance in procuring the blood specimens: Drs. E. A. Goldman and J. J. Lott, Dr. Frank Thomas, and Dr. C. A. Colson.

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DISABLING MORBIDITY AMONG MALE AND FEMALE INDUSTRIAL WORKERS DURING 1941, AND AMONG MALES DURING THE FIRST QUARTER OF 1942 [1]

By WILLIAM M. GAFAFER, *Senior Statistician, United States Public Health Service.*

The quarterly reports for the year 1941 on the frequency of sickness and nonindustrial injuries causing disability for 8 consecutive calendar days or longer among a group of over 220,000 male members of 26 industrial sick-benefit organizations have appeared (*1–4*), the organizations including sick-benefit associations, group-insurance plans, and company relief departments. The present report records the experience among both males and females for the year 1941, and among males for the first quarter of 1942. The last report of the series referring to the experience among females appeared in 1941 (*1*).

The year 1941.—Table 1 shows by cause and sex the frequency of cases per 1,000 industrial workers for the year 1941 and earlier years. A comparison of the frequencies for males during 1941 with the corresponding frequencies covering the 5-year period, 1936–40, shows the following noteworthy differences: The 22 percent increase in bronchitis, the 28 percent increase in pneumonia, and the 20 percent increase in appendicitis.

The corresponding comparison for the females reveals a 30 percent increase in appendicitis, a 38 percent increase in diseases of the heart and other circulatory diseases, and a 41 percent increase in infectious and parasitic diseases. Thus each sex shows an increase in appendicitis.

It is noteworthy that while the total frequency for 1941, 1936–40, and 1940, respectively, is approximately 60 percent greater among the females than among the males, there are certain causes and cause groups that show for each of the 3 time periods lower rates among the females; these are pneumonia, diseases of the stomach except cancer, hernia, diseases of the heart, cancer all sites, and the rheumatic group.[2] For each of the 3 time periods striking excesses in rate are shown by the females when compared with the males by influenza and grippe,

[1] From the Division of Industrial Hygiene, National Institute of Health.

[2] Summation of neuralgia, neuritis, and sciatica; rheumatism, acute and chronic; and diseases of the organs of locomotion except diseases of the joints.

TABLE 1.—*Frequency of cases of sickness and nonindustrial injuries lasting 8 consecutive calendar days or longer among male and female employees in various industries, by cause, experience of 1941 and 1940, and the 5 years, 1936–40*

Cause (numbers in parentheses are disease title numbers from the International List of Causes of Death, 1939)	Annual number of cases per 1,000 persons					
	Males			Females		
	1941	1936–40 [1]	1940	1941	1936–40 [1]	1940
Sickness and nonindustrial injuries [2]	101.3	91.6	96.4	163.3	145.9	153.3
Percent of female rate	*62*	*63*	*63*			
Percent of male rate				*161*	*159*	*159*
Nonindustrial injuries (169–195)	12.0	11.3	11.8	13.9	13.0	14.0
Sickness [3]	89.3	80.3	84.6	149.4	132.9	139.3
Respiratory diseases	40.8	34.5	37.7	63.1	60.3	63.5
Influenza and grippe (33)	18.9	16.1	17.5	28.0	27.1	27.7
Bronchitis, acute and chronic (106)	5.6	4.6	5.2	7.1	7.6	8.2
Diseases of the pharynx and tonsils (115b, 115c)	5.5	4.8	4.9	12.0	12.3	12.7
Pneumonia, all forms (107–109)	3.7	2.9	3.6	.7	1.7	1.8
Tuberculosis of the respiratory system (13)	.7	.8	.7	.7	.7	.6
Other respiratory diseases (104, 105, 110–114)	6.4	5.3	5.8	14.6	10.9	12.5
Nonrespiratory diseases	45.6	43.4	44.8	81.8	68.2	71.8
Digestive diseases	15.4	13.7	14.4	26.9	22.4	21.7
Diseases of the stomach except cancer (117, 118)	4.2	3.8	3.9	2.7	2.2	1.2
Diarrhea and enteritis (120)	1.5	1.2	1.4	2.9	2.2	2.4
Appendicitis (121)	5.3	4.4	5.0	15.6	12.0	12.1
Hernia (122a)	1.5	1.6	1.5	.2	.4	.3
Other digestive diseases (115a, 115d, 116, 122b–129)	2.9	2.7	2.6	5.5	5.6	5.7
Nondigestive diseases	30.2	29.7	30.4	54.9	45.8	50.1
Diseases of the heart (90–95)	2.5	2.7	2.9	1.8	1.4	1.7
Other circulatory diseases (96–103)	3.6	3.3	3.7	4.7	3.3	3.6
Nephritis, acute and chronic (130–132)	.4	.4	.4	.5	.4	.6
Other genitourinary diseases (133–139)	2.4	2.4	2.7	10.6	9.3	10.2
Neuralgia, neuritis, sciatica (87b)	2.0	2.2	2.3	2.5	2.1	2.6
Neurasthenia and the like (part of 84d)	1.0	1.0	1.1	6.2	5.7	5.4
Other diseases of the nervous system (80–85, 87, except part of 84d, and 87b)	1.3	1.1	1.0	1.3	1.0	1.5
Rheumatism, acute and chronic (58, 59)	3.7	3.9	4.0	3.3	3.1	3.1
Diseases of the organs of locomotion except diseases of the joints (156b)	2.8	2.9	2.8	2.4	1.6	2.2
Diseases of the skin (151–153)	2.7	2.9	2.8	3.9	3.1	3.4
Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44) [3]	2.5	2.2	1.8	4.1	2.9	2.6
Cancer, all sites (45–55)	.5	.5	.6	.3	.4	.5
All other diseases (56, 57, 60–79, 88, 89, 140–150, 154, 155, 156a, 157, 162)	4.8	4.2	4.3	13.3	11.5	12.7
Ill-defined and unknown causes (200)	2.9	2.4	2.1	4.5	4.4	4.0
Number of person-years, all reporting organizations	257,726	955,268	216,621	18,008	78,966	16,318
Number of organizations	29		29	24		24

[1] Average of the 5 annual rates.
[2] Industrial injuries, venereal diseases, and a few numerically unimportant causes of disability are not reported.
[3] Except influenza, respiratory tuberculosis, and the venereal diseases.

diseases of the pharynx and tonsils, diarrhea and enteritis, appendicitis, and neurasthenia and the like.

The years 1932–41.—A review of the sex-specific frequency rates for the 10 years, 1932–41, discloses that the year 1941 has recorded for it some unusually high rates. For the males the frequency of sickness and nonindustrial injuries begins with 97.5 in 1932, drops to 78.1 in 1934, rises to 99.5 in 1937, decreases to 82.3 in 1938 and gradually rises to 101.3 in 1941, the last rate being 12 percent greater than the 10-year mean of 90.2. For the females, on the other hand, the corresponding rate begins with 158.4, passes through 2 low values of 131.3

TABLE 2.—*Frequency of cases of sickness and nonindustrial injuries lasting 8 consecutive calendar days or longer among* MALE *employees in various industries, by cause, the first quarter of 1942 compared with the first quarters of 1941 and 1940* [1]

Cause (numbers in parentheses are disease title numbers from the International List of Causes of Death, 1939)	Annual number of cases per 1,000 males for the first quarter		
	1942	1941	1940
Sickness and nonindustrial injuries [2]	121.3	139.7	134.8
Nonindustrial injuries (169-195)	11.9	11.6	12.6
Sickness [2]	109.4	128.1	122.2
Respiratory diseases	57.1	79.7	69.9
Influenza and grippe (33)	24.5	51.1	39.4
Bronchitis, acute and chronic (106)	9.2	7.9	8.7
Diseases of the pharynx and tonsils (115b, 115c)	5.8	5.6	6.1
Pneumonia, all forms (107-109)	7.2	5.9	6.2
Tuberculosis of the respiratory system (13)	.6	.5	.7
Other respiratory diseases (104, 105, 110-114)	9.8	8.7	8.8
Nonrespiratory diseases	50.1	45.3	50.1
Digestive diseases	15.7	14.5	15.4
Diseases of the stomach except cancer (117,118)	4.3	3.9	4.1
Diarrhea and enteritis (120)	1.5	1.2	1.4
Appendicitis (121)	5.2	5.0	5.5
Hernia (122a)	1.7	1.6	1.4
Other digestive diseases (115a, 115d, 116, 122b-129)	3.0	2.8	3.0
Nondigestive diseases	34.4	30.8	34.7
Diseases of the heart and arteries, and nephritis (90-99, 102, 130-132)	4.6	4.7	5.2
Other genitourinary diseases (133-138)	2.4	2.1	3.0
Neuralgia, neuritis, sciatica (87b)	2.2	2.1	2.9
Neurasthenia and the like (part of 84d)	.9	.8	1.1
Other diseases of the nervous system (80-85, 87, except part of 84d, and 87b)	1.2	1.2	1.2
Rheumatism, acute and chronic (58, 59)	3.9	4.7	4.6
Diseases of the organs of locomotion except diseases of the joints (156b)	3.4	3.0	3.4
Diseases of the skin (151-153)	2.3	2.3	3.2
Infectious and parasitic diseases [3] (1-12, 14-24, 26-29, 31, 32, 34-44)	3.4	2.4	2.2
All other diseases (45-57, 60-79, 88, 89, 100, 101, 103, 154, 155, 156a, 157, 162)	10.1	7.5	7.9
Ill-defined and unknown causes (200)	2.2	3.1	2.2
Average number of males covered in the record	253,500	218,021	196,766
Number of organizations	22	22	26

[1] The same 22 organizations are included in 1942 and 1941.
[2] Industrial injuries, venereal diseases, and a few numerically unimportant causes of disability are not reported.
[3] Except influenza, respiratory tuberculosis, and the venereal diseases.

(1933) and 130.4 (1938), and rises to its highest value, 163.3, in 1941, this rate being 11 percent in excess of the 10-year mean of 147.1. Rates for males for 1941 that have never been equalled or exceeded in the 10-year period are those for bronchitis (5.6), pneumonia (3.7), and appendicitis (5.3); these rates exceed the corresponding 10-year means by 33 percent, 42 percent, and 26 percent, respectively. The frequency of interest for the females is that for appendicitis which in 1941 reached the value of 15.6; during the 10-year period this value was never equalled or exceeded and is 37 percent in excess of the 10-year mean of 11.4.

Case duration.—The inclusion of sex-specific data on individual case duration in the reports from most of the industrial sick benefit organizations makes possible the examination of the frequency of cases disabling for a specified number of days or more. A comparison of these frequencies for sickness and nonindustrial injuries, and specific

cause groups, with the corresponding frequencies published for the year 1940 (*1*) shows no striking differences.

First quarter of the year 1942.—The morbidity experience among males for the first quarter of 1942 as compared with the corresponding quarter for 1941 and 1940 is shown in table 2. Attention is directed to the relatively low rate for influenza and grippe for 1942 (24.5), which represents a decrease of 52 percent when compared with the epidemic rate for 1941 (51.1), and a difference of 30 percent below the corresponding mean for the first quarters of the 10 years 1933–42. Bronchitis and pneumonia, however, show increases of 16 percent and 22 percent, respectively, when compared with the preceding year. In fact, an inspection of the first quarter rates for the past 10 years shows that the 1942 rates for bronchitis (9.2) and pneumonia (7.2) have never been exceeded or equaled, bronchitis showing an excess of 37 percent and pneumonia one of 57 percent when related to their respective 10-year means, 6.7 and 4.6.

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PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

July 19–August 15, 1942

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from health departments. The reports from each State 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-week period ended August 15, the number reported for the corresponding period in 1941, and the median number for the years 1937–41.

DISEASES ABOVE MEDIAN PREVALENCE

Influenza.—The number of cases (1,396) of influenza reported for the 4 weeks ended August 15 was only about one-half of the number reported during the corresponding week in 1941, but it represented a slight increase over the 1937–41 median incidence. Each region

except the South Atlantic and West South Central contributed to the increase. The relatively high incidence of this disease in 1941 was largely due to an excess of cases in the State of Texas; the number of cases reported from that State during the current period was 315, as compared with 1,294 last year.

Meningococcus meningitis.—For the current period there were 210 cases of meningococcus meningitis reported, as compared with 116 for the corresponding period in 1941 and an average of 122 cases in the years 1937–41. The relatively high incidence was due to an excess of cases in the Atlantic Coast and Pacific regions. In other regions the number of cases either closely approximated the seasonal expectancy or fell considerably below. For the country as a whole the incidence was the highest recorded for this period since 1937 when 250 cases were reported.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—The favorable record of diphtheria continued during the 4 weeks ended August 15. There were 600 cases reported, which marks a new low for this season of the year. The New England and West South Central regions reported a slight increase over the normal seasonal expectancy, but in all other regions the number of cases was relatively low.

Measles.—For the current 4-week period there were 6,928 cases of measles reported, as compared with 12,170 for the corresponding period in 1941 and an average of approximately 8,600 cases in the years 1937–41. The incidence was unusually high in the Pacific region, with minor increases over the expected seasonal incidence in the West North Central and Mountain regions; all other regions reported fewer cases than have normally been recorded for this season of the year.

Poliomyelitis.—The number of cases of poliomyelitis rose from 237 during the 4 weeks ended July 18 to 570 during the 4 weeks ended August 15. Of the total number of cases, Illinois reported 73; Tennessee, 57; Kentucky, 50; New Jersey, 44; Arkansas, 37; Michigan, 26; and New York, 25—more than one-half of the reported cases occurred in those 7 States. For the country as a whole the rate of increase was about normal for this season of the year, but the number of cases was slightly below normal, compared with the experience of preceding years.

Considering the situation in geographic regions, the number of cases (131) reported in the East South Central region was more than 3

times the 1937–41 median figure for that region; the number in the West South Central was one and one-half times the seasonal expectancy, and the North Atlantic regions reported an excess of approximately 20 percent over the normal incidence. In the South Atlantic region where the disease was unusually prevalent at this time last year, the incidence was considerably below the average of preceding years and the number of cases was comparatively low in the West North Central, Mountain, and Pacific regions.

Scarlet fever.—This disease continues at a favorable level. The number of cases (2,582) reported for the current period represents the lowest incidence on record for this period. The number of cases reported from the New England, South Atlantic and South Central regions represented excesses over the 1937–41 median figures, but in other regions the incidence was relatively low.

Smallpox.—The number of cases of smallpox was the lowest on record for this period. The reported cases (16) dropped considerably below even the previous year during which 29 cases were reported.

Typhoid and paratyphoid fever.—The number of cases (995) of typhoid and paratyphoid fever reported was also the lowest incidence of this disease on record for this period. A few more cases than might be expected were reported from the Mountain region, but in all other regions the number of cases was considerably below the average seasonal incidence.

Whooping cough.—The incidence of whooping cough was relatively low, 13,584 cases being reported for the current period, as compared with approximately 16,000 cases for the corresponding period in 1941, an average of approximately 15,000 cases in the years 1938–41. An excess over the seasonal average was reported from the New England and East North Central regions, but in all other regions the disease was considerably less prevalent than in preceding years.

MORTALITY, ALL CAUSES

The average mortality rate from all causes in large cities for the 4 weeks ended August 15, based on data received from the Bureau of the Census, was 10.5 per 1,000 inhabitants (annual basis). The rate was slightly below that for the corresponding period in the two preceding years, but it was a little higher than the 1937–41 average rate (10.2 per 1,000).

Number of reported cases of 9 communicable diseases in the United States during the 4-week period July 19–August 15, 1942, the number for the corresponding period in 1941, and the median number of cases reported for the corresponding period, 1937–41

Division	Current period	1941	5-year median	Current period	1941	5-year median	Current period	1941	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	600	609	1,030	1,396	2,715	1,322	6,928	12,170	8,591
New England	21	17	17	5	3	3	877	1,297	899
Middle Atlantic	52	68	129	18	13	13	1,181	3,336	3,152
East North Central	90	99	136	106	73	91	1,246	2,607	2,571
West North Central	30	51	63	31	26	26	387	467	373
South Atlantic	145	123	219	517	707	526	374	2,269	677
East South Central	85	50	126	85	72	72	89	411	352
West South Central	119	105	107	392	1,370	492	297	605	317
Mountain	14	56	56	161	161	79	693	407	407
Pacific	44	40	73	81	290	55	1,784	771	771
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	210	116	122	570	1,296	783	2,582	2,714	3,117
New England	28	6	6	28	27	16	300	274	200
Middle Atlantic	67	31	31	81	130	71	493	533	637
East North Central	15	13	13	135	146	183	656	779	939
West North Central	8	8	8	40	40	69	307	289	359
South Atlantic	35	22	22	63	490	102	268	228	249
East South Central	13	20	24	131	389	42	172	169	158
West South Central	14	7	16	63	32	42	135	103	112
Mountain	4	5	5	14	12	22	78	80	135
Pacific	26	4	7	15	30	130	173	204	243
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [3]		
United States	16	29	178	995	1,199	2,001	13,584	16,099	[3] 15,357
New England	0	0	0	24	23	33	1,414	1,123	937
Middle Atlantic	0	0	0	87	164	164	3,505	2,611	3,825
East North Central	5	10	60	95	136	220	4,311	4,155	4,289
West North Central	6	9	57	52	62	118	682	1,169	859
South Atlantic	0	2	1	222	264	493	1,238	2,351	1,969
East South Central	2	0	4	185	187	337	539	503	567
West South Central	0	3	6	241	264	541	625	1,037	1,027
Mountain	3	4	20	64	53	53	431	1,171	683
Pacific	0	1	31	25	46	66	839	1,979	1,290

[1] Mississippi, New York, and Pennsylvania excluded; New York City included.
[2] Mississippi excluded.
[3] 4-year (1938–41) average.

DEATHS DURING WEEK ENDED AUGUST 22, 1942

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

	Week ended Aug. 22, 1942	Corresponding week, 1941
Data from 85 large cities of the United States:		
Total deaths	7,309	6,977
Average for 3 prior years	6,853	
Total deaths, first 33 weeks of year	272,408	276,203
Deaths per 1,000 population, first 33 weeks, annual rate	11.8	12.0
Deaths under 1 year of age	569	456
Average for 3 prior years	456	
Deaths under 1 year of age, first 33 weeks of year	18,181	16,868
Data from industrial insurance companies:		
Policies in force	64,962,563	64,428,243
Number of death claims	9,750	10,800
Death claims per 1,000 policies in force, annual rate	7.8	8.7
Death claims per 1,000 policies, first 33 weeks, annual rate	9.4	9.8

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 AUGUST 29, 1942

Summary

For the country as a whole, the incidence of practically all of the communicable diseases for which weekly telegraphic reports are received remained low during the current week. Meningococcus meningitis, however, continues persistently above the 5-year (1937–41) median expectancy and above the incidence in any prior year since 1937. A total of 58 cases was reported, as compared with 42 for the preceding week and with 63 cases for the corresponding week in 1937. The largest numbers of cases are still being reported from the Middle and South Atlantic States.

A total of 202 cases of poliomyelitis was reported as compared with 183 for the preceding week and a 5-year median of 606 cases. The current incidence and the total cases to date this year are below the figures for the corresponding periods of any prior year since 1938. The largest numbers of cases were reported in the Middle Atlantic and East North Central States. Only 4 States reported more than 10 cases—New Jersey 26, Illinois 23, New York 19, and Michigan 11. Tennessee (10) and Kentucky (9) were the only southern States reporting more than 5 cases.

Influenza is slightly above the 5-year median. Of the 472 cases reported currently, 128 occurred in Texas, 117 in South Carolina, and 58 in Virginia—64 percent of the total cases occurring in these three States.

Only 2 cases of smallpox were reported (1 in Arkansas and 1 in Idaho). A total of 614 cases has been reported this year to date, as compared with 1,155 last year and a 5-year median of 8,046 cases.

Other reports for the week include 1 case of anthrax in Pennsylvania, 19 cases of infectious encephalitis (8 of equine type in Washington State), 21 cases of amebic dysentery, 249 cases of bacillary (125 in Texas), 224 cases of unspecified dysentery (181 in Virginia), 11 cases of Rocky Mountain spotted fever, 18 cases of tularemia, and 152 cases of endemic typhus fever (54 in Georgia and 45 in Texas). One case of Weil's disease was reported in Maryland and 3 cases of undulant fever were reported in Mississippi.

The death rate for the current week for 88 large cities in the United States is 10.3 per 1,000 population, as compared with 10.4 last week and a 3-year (1939–41) average of 10.0.

Telegraphic morbidity reports from State health officers for the week ended August 29, 1942, and comparison with corresponding week of 1941 and 5-year median

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

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended		Median 1937–41	Week ended		Median 1937–41	Week ended		Median 1937–41	Week ended		Median 1937–41
	Aug. 29, 1942	Aug. 30, 1941		Aug. 29, 1942	Aug. 30, 1941		Aug. 29, 1942	Aug. 30, 1941		Aug. 29, 1942	Aug. 30, 1941	
NEW ENG.												
Maine	0	2	0				6	15	6	0	0	0
New Hampshire	0	0	0				3	0	0	0	0	0
Vermont	1	0	0				24	4	2	0	0	0
Massachusetts	2	1	1				44	38	36	6	1	0
Rhode Island	0	1	0				4	3	4	0	0	0
Connecticut	0	0	0	6			8	13	8	0	0	
MID. ATL.												
New York	9	10	9	[1] 1		[1] 2	52	57	84	6	2	2
New Jersey	1	3	3	5	3	3	36	20	20	5	0	1
Pennsylvania	2	7	13		1		20	69	39	6	2	2
E. NO. CEN.												
Ohio	6	3	8	3	8	2	18	24	20	1	1	1
Indiana	4	8	7	4	3	4	4	5	5	1	1	0
Illinois	9	10	14	8	2	4	13	9	22	1	1	2
Michigan [2]	3	6	6	3			35	9	24	2	2	1
Wisconsin	6	0	1		6	20	44	43	39	1	0	0
W. NO. CEN.												
Minnesota	1	2	2			1	6	1	2	0	0	0
Iowa	5	2	2		1		4	4	8	0	0	1
Missouri	0	6	6		1	1	8	6	2	2	0	1
North Dakota	0	0	2	5			1	6	1	0	0	0
South Dakota	4	9	0				2	3	1	0	0	0
Nebraska	0	0	0	7			10	2	3	0	0	0
Kansas	1	3	2	2		1	9	17	11	0	0	0
SO. ATL.												
Delaware	0	0	0				0	0	0	1	0	0
Maryland [2]	1	1	1	3	2	2	11	16	10	7	1	1
Dist. of Col.	2	0	2				1	6	3	1	0	0
Virginia	9	5	18	58	8	8	3	4	10	1	5	1
West Virginia	5	5	5	1		8	0	21	2	1	2	1
North Carolina	26	32	32				6	12	12	0	1	1
South Carolina	16	10	10	117	43	90	2	10	10	0	2	1
Georgia	8	18	20	1	19	1	0	28	2	0	0	0
Florida	0	1	3	10	6	3	2	4	2	0	0	0
E. SO. CEN.												
Kentucky	6	7	9	1	1	3	0	8	8	1	1	0
Tennessee	8	9	9	8	2	9	3	2	7	1	1	1
Alabama	14	18	17	12	6	6	6	16	17	3	1	1
Mississippi [2]	5	11	12							3	0	0
W. SO. CEN.												
Arkansas	10	7	8	12	2	5	0	14	5	0	0	0
Louisiana	2	0	5	8		5	1	3	1	0	1	1
Oklahoma	1	7	7	6	6	10	4	2	3	0	0	0
Texas	11	27	23	128	329	98	33	48	16	3	1	1
MOUNTAIN												
Montana	3	2	2				9	3	6	0	0	0
Idaho	0	0	0				17	3	1	0	0	0
Wyoming	5	0	0	8	4		6	0	0	0	0	0
Colorado	2	1	4	13	20		8	14	14	0	1	1
New Mexico	1	0	2				3	5	5	0	0	1
Arizona	0	1	1	26	30	18	6	10	3	0	0	0
Utah [2]	0	0	0		1		21	3	6	1	0	0
Nevada	0	0					0	0		0	0	
PACIFIC												
Washington	1	2	2				42	6	6	0	1	0
Oregon	0	1	1	3	4	5	53	16	9	1	1	0
California	7	5	12	13	16	11	101	90	49	3	0	0
Total	197	243	339	472	524	383	689	692	692	58	29	25
34 weeks	7,623	7,773	12,310	81,270	490,369	160,359	467,273	824,395	348,906	2,454	1,439	1,439

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended August 29, 1942, and comparison with corresponding week of 1941 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended		Median 1937–41	Week ended		Median 1937–41	Week ended		Median 1937–41	Week ended		Median 1937–41
	Aug. 29, 1942	Aug. 30, 1941		Aug. 29, 1942	Aug. 30, 1941		Aug. 29, 1942	Aug. 30, 1941		Aug. 29, 1942	Aug. 30, 1941	
NEW ENG.												
Maine	1	4	1	6	1	2	0	0	0	2	1	2
New Hampshire	0	2	0	0	0	0	0	0	0	0	1	0
Vermont	1	3	1	1	4	2	0	0	0	0	6	0
Massachusetts	2	21	4	35	52	20	0	0	0	5	3	4
Rhode Island	0	5	1	3	3	2	0	0	0	0	0	0
Connecticut	3	5	0	4	5	6	0	0	0	0	5	4
MID. ATL.												
New York	19	69	60	46	62	54	0	0	0	7	26	17
New Jersey	26	29	8	15	21	17	0	0	0	4	4	4
Pennsylvania	3	65	13	23	32	42	0	0	0	18	23	23
E. NO. CEN.												
Ohio	9	36	21	67	34	35		0	0	5	12	15
Indiana	5	6	6	11	7	21	0	0	0	2	0	6
Illinois	23	31	20	37	43	51	0	0	1	9	10	20
Michigan [3]	11	26	31	23	31	40	0	0	0	3	11	11
Wisconsin	4	3	8	32	24	24	0	0	0	0	4	2
W. NO. CEN.												
Minnesota	3	21	14	9	15	16	0	0	0	1	0	1
Iowa	7	0	4	9	7	13	0	0	0	2	2	3
Missouri	5	5	5	8	14	15	0	0	0	10	9	17
North Dakota	2	0	0	1	2	4	0	0	0	1	0	2
South Dakota		3	3	2	11	8	0	0	0	0	0	0
Nebraska	7	0	2	5	3	3	0	0	0	2	1	1
Kansas	2	3	3	13	29	19	0	0	0	3	4	7
SO. ATL.												
Delaware	1	0	0	3	3	0	0	0	0	0	0	0
Maryland [2]	3	32	1	6	9	7	0	0	0	6	6	7
Dist. of Col	1	8	2	5	6	5	0	0	0	1	1	2
Virginia	1	5	4	9	7	7	0	0	0	12	6	19
West Virginia	2	2	2	15	8	11	0	0	0	6	9	9
North Carolina	4	10	4	22	17	21	0	0	0	15	11	20
South Carolina	4	8	1	2	3	5	0	0	0	5	9	8
Georgia	1	50	4	7	5	8	0	0	0	15	32	28
Florida	0	16	2	5	2	2	0	0	0	6	7	3
E. SO. CEN.												
Kentucky	9	15	4	17	17	17	0	0	0	11	20	30
Tennessee	10	29	4	14	8	12	0	0	0	5	20	17
Alabama	5	65	4	26	11	11	0	0	0	13	6	14
Mississippi [2]	2	12	1	9	6	4	0	0	0	5	18	13
W. SO. CEN.												
Arkansas	5	3	1	1	8	8	1	0	0	12	9	33
Louisiana	2	3	3	2	2	3	0	1	0	6	13	23
Oklahoma	0	2	2	4	3	8	0	0	0	10	14	24
Texas	2	3	8	18	18	18	0	0	0	19	26	40
MOUNTAIN												
Montana	0	3	3	9	6	6	0	0	0	1	2	2
Idaho	1	1	0	0	5	3	1	0	1	1	0	1
Wyoming	1	0	0	2	0	1	0	0	0	0	1	1
Colorado	0	0	3	6	11	8	0	0	0	4	0	5
New Mexico	1	0	1	2	0	1	0	0	0	8	0	4
Arizona	1	2	2	0	0	1	0	0	0	1	1	3
Utah [2]	3	3	2	2	2	4	0	0	0	2	1	2
Nevada	0	0		0	0		0	0		0	1	
PACIFIC												
Washington	1	0	1	4	8	9	0	0	0	0	3	4
Oregon	0	5	1	5	14	4	0	1	2	1	0	3
California	9	6	13	41	27	44	0	0	1	3	7	7
Total	202	620	606	586	606	666	2	2	34	242	345	479
34 weeks	1,707	4,021	3,258	89,759	90,342	117,179	614	1,155	8,046	4,267	5,105	7,584

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended August 29, 1942—Continued

Division and State	Whooping cough		Anthrax	Week ended August 29, 1942							
	Week ended			Dysentery			Encephalitis	Leprosy	Rocky Mountain spotted fever	Tularemia	Typhus fever
	Aug. 29, 1942	Aug. 30, 1941		Amebic	Bacillary	Unspecified					
NEW ENG.											
Maine	23	19	0	0	0	0	0	0	0	0	0
New Hampshire	0	8	0	0	0	0	0	0	0	0	0
Vermont	57	16	0	0	0	0	0	0	0	0	0
Massachusetts	133	110	0	0	2	0	0	0	0	0	0
Rhode Island	23	12	0	0	0	0	0	0	0	0	0
Connecticut	52	38	0	0	0	0	0	0	0	0	0
MID. ATL.											
New York	305	299	0	1	19	0	2	0	0	0	0
New Jersey	240	88	0	1	0	0	0	0	0	0	0
Pennsylvania	199	192	1	0	0	0	1	0	0	0	1
E. NO. CEN.											
Ohio	179	257	0	0	0	8	0	0	1	1	0
Indiana	30	17	0	0	0	0	0	0	0	0	0
Illinois	261	201	0	0	28	0	0	0	0	1	0
Michigan [2]	231	305	0	0	24	0	0	0	0	0	0
Wisconsin	228	271	0	1	0	0	0	0	0	0	0
W. NO. CEN.											
Minnesota	61	35	0	2	0	0	0	0	0	0	0
Iowa	13	40	0	0	0	0	0	0	1	0	0
Missouri	7	0	0	0	0	2	0	0	0	0	0
North Dakota	6	13	0	0	0	0	0	0	0	2	0
South Dakota	0	2	0	0	0	0	0	0	0	0	0
Nebraska	7	3	0	0	0	0	0	0	0	0	0
Kansas	45	63	0	0	0	0	1	0	0	0	0
SO. ATL.											
Delaware	0	1	0	0	0	0	0	0	0	0	0
Maryland [2]	48	56	0	0	0	9	1	0	1	0	0
Dist. of Col	11	15	0	0	0	0	0	0	0	0	0
Virginia	17	10	0	0	0	181	0	0	3	2	0
West Virginia	13	16	0	0	0	0	0	0	0	0	0
North Carolina	41	122	0	0	0	0	0	0	2	2	2
South Carolina	25	61	0	0	0	0	0	0	0	0	6
Georgia	19	19	0	1	5	0	0	0	0	0	54
Florida	4	23	0	0	0	0	0	0	0	0	12
E. SO. CEN.											
Kentucky	35	47	0	1	3	0	0	0	0	0	1
Tennessee	37	30	0	1	0	13	0	0	1	1	2
Alabama	21	25	0	0	0	0	0	0	0	0	23
Mississippi [2]	-------	-------	0	0	0	0	0	0	0	0	1
W. SO. CEN.											
Arkansas	4	13	0	11	9	0	0	0	0	2	1
Louisiana	5	1	0	1	3	0	0	0	0	0	4
Oklahoma	4	11	0	0	0	0	0	0	0	0	0
Texas	111	149	0	1	125	0	0	0	1	1	45
MOUNTAIN											
Montana	30	32	0	0	0	0	2	0	0	0	0
Idaho	0	27	0	0	0	0	0	0	0	0	0
Wyoming	1	35	0	0	0	0	0	0	0	2	0
Colorado	29	93	0	0	19	0	1	0	0	0	0
New Mexico	17	8	0	0	4	0	1	0	1	0	0
Arizona	12	7	0	0	0	11	0	0	0	0	0
Utah [2]	26	49	0	0	0	0	0	0	0	3	0
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	12	65	0	1	0	0	8	0	0	1	0
Oregon	16	19	0	0	0	0	0	0	0	0	0
California	129	194	0	1	6	0	2	0	0	0	0
Total	2,767	3,117	1	23	247	224	19	0	11	18	152
34 weeks	125,149	149,416	-------	-------	-------	-------	-------	-------	-------	-------	-------

[1] New York City only.
[2] Period ended earlier than Saturday.

WEEKLY REPORTS FROM CITIES

City reports for week ended August 15, 1942

This table lists the reports from 89 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								
Atlanta, Ga	2	0	3	0	1	0	2	0	0	0	1	1
Baltimore, Md	0	0	------	0	4	1	8	0	3	0	0	24
Barre, Vt	0	0	------	0	0	0	0	0	0	0	0	0
Billings, Mont	0	0	------	0	0	0	1	0	0	0	0	7
Birmingham, Ala	0	0	2	0	0	0	1	0	1	0	1	7
Boise, Idaho	0	0	------	0	0	0	0	0	0	0	0	0
Boston, Mass	1	0	------	0	19	1	5	1	20	0	0	33
Bridgeport, Conn	0	0	------	0	0	0	0	0	2	0	0	1
Brunswick, Ga	0	0	------	0	0	0	0	0	0	0	0	0
Buffalo, N. Y	0	0	------	0	5	1	7	0	4	0	0	18
Camden, N. J	0	0	------	0	0	0	1	0	3	0	0	1
Charleston, S. C	0	0	------	0	0	0	0	1	0	0	0	0
Charleston, W. Va	0	0	------	0	0	0	0	0	0	0	0	0
Chicago, Ill	7	0	------	1	6	0	16	8	18	0	1	180
Cincinnati, Ohio	0	0	1	0	0	0	0	2	3	0	0	19
Cleveland, Ohio	2	0	------	0	1	0	5	1	6	0	0	46
Columbus, Ohio	0	0	------	0	1	0	0	0	4	0	0	10
Concord, N. H	0	0	------	0	0	0	1	0	0	0	0	0
Cumberland, Md	0	0	------	0	0	0	0	0	0	0	0	0
Dallas, Tex	0	0	------	0	1	0	2	0	2	0	0	7
Denver, Colo	2	0	4	0	3	0	3	0	4	0	0	13
Detroit, Mich	2	0	------	0	5	1	2	8	11	0	0	102
Duluth, Minn	0	0	------	0	0	0	0	0	0	0	0	7
Fall River, Mass	0	0	------	0	2	0	0	0	1	0	0	3
Fargo, N. Dak	0	0	------	0	2	0	0	0	0	0	0	0
Flint, Mich	0	0	------	0	0	0	1	0	0	0	0	6
Fort Wayne, Ind	0	0	------	0	0	0	2	0	0	0	0	7
Frederick, Md	1	0	------	0	0	0	0	0	0	0	0	0
Galveston, Tex	0	0	------	0	0	0	0	0	1	0	0	0
Grand Rapids, Mich	0	0	------	0	0	0	0	0	2	0	0	4
Great Falls, Mont	0	0	------	0	1	0	0	0	1	0	0	4
Hartford, Conn	0	0	------	0	1	0	0	1	0	0	0	12
Helena, Mont	1	0	------	0	0	0	0	0	0	0	0	0
Houston, Tex	1	0	------	0	0	0	4	0	1	0	1	10
Indianapolis, Ind	0	0	------	0	2	0	5	2	4	0	0	34
Kansas City, Mo	0	0	------	0	0	0	4	0	7	0	0	0
Kenosha, Wisc	0	0	------	0	0	0	0	0	0	0	0	11
Little Rock, Ark	0	0	4	0	0	0	2	0	0	0	0	0
Los Angeles, Calif	2	0	9	0	9	2	3	5	4	0	2	17
Lynchburg, Va	0	0	------	0	1	0	0	0	1	0	0	6
Memphis, Tenn	0	0	------	0	1	0	1	2	0	0	0	33
Milwaukee, Wis	0	1	------	0	29	0	2	0	3	0	0	42
Minneapolis, Minn	0	0	------	0	0	1	0	2	6	0	0	2
Missoula, Mont	0	0	------	0	0	0	1	0	0	0	0	2
Mobile, Ala	0	0	1	0	0	0	1	0	1	0	0	0
Nashville, Tenn	0	0	------	1	0	0	0	2	5	0	0	3
Newark, N. J	0	0	2	0	5	1	4	5	1	0	0	36
New Haven, Conn	0	0	------	0	0	0	0	0	1	0	0	0
New Orleans, La	0	0	3	1	0	4	9	2	2	0	1	0
New York, N. Y	7	2	1	0	8	4	33	3	14	0	9	130
Omaha, Nebr	0	0	------	0	0	0	1	0	0	0	0	2
Philadelphia, Pa	1	1	------	0	11	1	11	0	12	0	4	118
Pittsburgh, Pa	0	0	1	0	1	0	3	0	2	0	0	16
Portland, Maine	0	0	------	0	11	0	2	0	0	0	0	10
Providence, R. I	0	1	------	0	4	0	2	0	1	0	0	13
Pueblo, Colo	0	0	------	0	0	0	1	1	0	0	0	0
Racine, Wis	0	0	------	0	2	0	0	0	1	0	0	5
Reading, Pa	0	0	------	0	0	0	0	0	0	0	1	19
Richmond, Va	0	0	------	0	0	0	2	0	1	0	0	5

City reports for week ended August 15, 1942—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								
Roanoke, Va	0	0	------	0	0	0	0	0	0	0	1	0
Rochester, N. Y	0	0	------	0	0	0	4	1	2	0	1	15
Sacramento, Calif	0	0	------	0	0	0	1	0	0	0	0	0
Saint Joseph, Mo	0	0	------	0	0	0	1	0	0	0	0	0
Saint Louis, Mo	2	1	------	0	1	0	6	1	4	0	1	8
Saint Paul, Minn	0	0	------	0	1	0	3	1	0	0	0	27
Salt Lake City, Utah	0	0	------	0	16	0	0	1	1	0	1	11
San Antonio, Tex	1	0	------	0	2	0	1	0	0	0	1	3
San Francisco, Calif	1	0	------	0	8	0	2	0	0	0	1	7
Savannah, Ga	0	0	6	0	0	0	0	1	0	0	0	3
Seattle, Wash	0	0	------	0	17	0	2	0	1	0	0	12
Shreveport, La	1	0	------	0	0	0	4	0	0	0	0	0
South Bend, Ind	0	0	------	0	0	0	0	0	0	0	0	10
Spokane, Wash	0	0	------	0	3	0	2	0	0	0	0	2
Springfield, Ill	0	0	------	0	0	0	0	0	0	0	1	0
Springfield, Mass	0	0	------	0	3	0	3	0	3	0	0	2
Superior, Wis	0	0	------	0	1	0	0	0	0	0	0	6
Syracuse, N. Y	0	0	------	0	13	0	0	2	0	0	0	18
Tacoma, Wash	0	0	------	0	2	0	1	0	0	0	0	0
Tampa, Fla	0	0	------	0	0	0	1	0	0	0	0	0
Terre Haute, Ind	2	0	------	0	0	0	0	0	0	0	0	0
Topeka, Kans	0	0	------	0	0	0	0	0	0	0	0	4
Trenton, N. J	0	0	------	0	0	0	3	0	1	0	0	1
Washington, D. C	0	0	------	0	1	1	5	1	3	0	1	12
Wheeling, W. Va	0	0	------	0	0	0	2	0	1	0	1	9
Wichita, Kans	0	------	------	0	2	0	1	0	0	0	0	1
Wilmington, Del	0	0	------	0	0	0	1	0	0	0	0	3
Wilmington, N. C	0	0	------	0	0	0	0	0	0	0	1	5
Winston-Salem, N. C	2	0	------	0	0	0	2	0	0	0	0	0
Worcester, Mass	0	0	------	0	0	0	8	0	1	0	2	38

Dysentery, amebic.—Cases: Baltimore, 1; Los Angeles, 2.
Dysentery, bacillary.—Cases: Atlanta, 1; Baltimore, 3; Columbus, 1; Dallas, 1; New York, 9; Philadelphia, 1; Richmond, 2; St. Louis, 8; Detroit, 3.
Dysentery, unspecified.—Cases: San Antonio, 14.
Rocky Mountain spotted fever.—Cases: Baltimore, 1; Lynchburg, 1.
Typhus fever.—Cases: Atlanta, 1; Charleston, South Carolina, 3; Dallas, 1; Houston, 3; New Orleans, 1; San Antonio, 3; Savannah, 1; Winston-Salem, 1.

Rates (annual basis) per 100,000 population, for the group of 89 cities in the preceding table (estimated population, 1942, 34,085,159)

Period	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
		Cases	Deaths						
Week ended Aug. 15, 1942	5.81	5.66	0.31	31.82	30.60	25.70	0.00	5.20	158.79
Average, 1937–41	9.43	4.02	1.39	[1] 50.40	38.19	32.31	0.31	9.12	207.62

[1] Median.

PLAGUE INFECTION IN CALIFORNIA

Plague infection has been reported proved in specimens collected in California as follows:

Los Angeles County: July 21, 1942, in a pool of 59 fleas from 11 ground squirrels, *C. fisheri*, taken from the Camp of the Owls in Big Pines Park, and in a pool of 131 fleas from 26 ground squirrels, same species, taken on the premises of Jackson Stables in Big Pine Park.

Monterey County: In pools of fleas, tissue and ticks from ground squirrels, *C. beecheyi*, as follows: July 22, tissue from 1 squirrel taken 5½ miles south and 2½ miles west of Salinas; July 21 and 22, respectively, tissue from 4 squirrels and 16 ticks and 122 fleas from 39 squirrels taken 16 miles south of Salinas.

San Bernardino County: July 16, in a pool of 76 fleas from 18 ground squirrels, *C. fisheri*, taken ½ mile east of Wrightwood.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—During the week ended August 1, 1942, 2 plague infected rats were reported in Honokaa, Paauhau area, Island of Hawaii, T. H., 43.4 and 41.6 miles from the port of Hilo.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 1, 1942.—During the week ended August 1, 1942, 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
Cerebrospinal meningitis			1	3	1		1	1		7
Chickenpox	2	13	1	43	105	13	1	22	51	251
Diphtheria	1	12	2	13	3	1	10		1	43
Dysentery				33						33
Encephalomyelitis							1			1
German measles				4	11		4	2	3	24
Influenza		1			1	3	1		2	8
Lethargic encephalitis						3				3
Measles				18	38	4	14	2	5	81
Mumps		13	2	19	47	17	29	18	100	245
Pneumonia		3			5	1			3	12
Poliomyelitis		4	10	12	1	1				28
Scarlet fever		5	3	33	42	8	10	27	14	142
Trachoma						1				1
Tuberculosis	2	4	4	119	42		16	16		203
Typhoid and paratyphoid fever			8	20	7		2	1		33
Undulant fever				1	2					3
Whooping cough		1		219	65	8	3	3	28	327
Other communicable diseases		5		6	207	26		2	3	249

Province of Alberta—Plague and tularemia infection in fleas.—Under date of August 19, 1942, plague and tularemia infection in fleas, presumably from ground squirrels, was reported as follows: July 22 and August 18, plague infection in flea specimens collected near Suffield.[1] On August 18, tularemia infection was found in a flea specimen collected 35 to 40 miles south of Suffield.

BRITISH WEST INDIES

Trinidad—Port of Spain—Poliomyelitis.—During the period March 1–April 15, 1942, 5 cases of poliomyelitis, with 2 deaths, were reported in Port of Spain, Trinidad.

[1] For recent previous report of plague infection in Alberta Province, see PUBLIC HEALTH REPORTS for July 24, 1942, p. 1112.

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

NOTE.—Except in cases of unusual prevalence, 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 cumulative table showing the reported prevalence of 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.)

Typhus Fever

Algeria.—During the period July 11–20, 1942, 567 cases of typhus fever were reported in Algeria.

Mexico.—During May 1942, six cities in Mexico reported 52 cases of typhus fever, with 12 deaths.

Morocco.—During the week ended August 1, 1942, 134 cases of typhus fever were reported in Morocco.

Rumania.—During the week ended August 8, 1942, 11 cases of typhus fever were reported in Rumania.

Tunisia.—During the period July 11–20, 208 cases of typhus fever were reported in Tunisia (8 cases in Tunis).

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COURT DECISIONS ON PUBLIC HEALTH

City water supply—licensing by State health department of person in charge.—(New Jersey Court of Chancery; *State ex rel. Department of Health of New Jersey* v. *City of Hoboken*, 23 A.2d 587; decided January 9, 1942.) A statute of New Jersey provided that no municipality should appoint any person to be in direct general charge of a water-supply system unless he held a license issued by the State department of health. The term "water-supply system" was not defined in the statute but the State department of health had adopted a resolution defining it as "a system comprising structures which operating alone or with other structures result in the derivation, conveyance (or transmission) or distribution of water for potable or domestic purposes." The regulations of the said department establishing a classification of licenses required in the operation of water-supply systems divided water systems into 4 groups and required licenses for the operation of those systems only which employed purification and treatment. The city of Hoboken obtained its water primarily from the city of Jersey City which supplied it under a contract. Hoboken owned all the water mains and appurtenances within the city and controlled their operation. The process of treatment and purification of the water supplied by Jersey City to Hoboken was completed by Jersey City before the water was delivered to the water mains of Hoboken at the city line dividing the two municipalities. In other words Jersey City supplied water to Hoboken and the latter city merely

distributed it, performing no other function in the premises. The city of Hoboken was governed by an elected board of commissioners and the powers and duties relating to the city's potable water were assigned by the board to the department of revenue and finance of which one of the members of the board was director.

In a suit brought by the State at the relation of the State department of health it was alleged that the city of Hoboken owned a water-supply system and had appointed a superintendent in direct general charge thereof who was not licensed by the department. It was sought to enjoin the city from operating the alleged water-supply system under the supervision of the commissioner until he obtained a license from the department.

The Court of Chancery of New Jersey took the view that the bill of complaint should be dismissed. The city of Hoboken, said the court, was not amenable to the regulations of the State department of health regarding classification of licenses because the evidence showed that the city neither derived its supply of water from any of the sources specified in any of the 4 groups nor did it employ any of the methods of purification or treatment mentioned. It was also pointed out that the State statutes recognized the distinction between a "water-supply" system and a "water-distribution" system and that in the instant case Hoboken merely distributed the water supplied it by Jersey City.

Regarding the city of Hoboken's challenge of the State department of health's right to define what the legislature's term "water-supply system" implied, the court said that the challenge was justified. "Such right to define resides in the courts. When the legislature fails to clarify a term of doubtful meaning, then the courts, if called upon, will define, interpret, or construe the statutory enactment."

According to the court no evidence was offered by the complainant to show that the city of Hoboken had a water-supply system within the intendment and meaning of the statute upon which the suit was based; neither did the legislature ordain that an elected official occupyiug the status which the city commissioner held was required to take out such a license as was mentioned in the said statute.

Ice cream—sale—name and address of manufacturer on wrappers—local board of health regulation upheld.—(Pennsylvania Supreme Court; *Simco Sales Service of Pennsylvania, Inc.*, v. *Brackin et al., Board of Health of Borough of Lansdowne*, 26 A.2d 323; decided May 11, 1942, rehearing denied May 26, 1942.) The regulations of a borough board of health relative to ice cream prohibited false labels, required the name and address of the manufacturer to appear on all wrappers, and provided that no license should issue until the board was satisfied that all State laws and regulations had been complied with and that all permits and licenses required under State laws and regulations had

been obtained. The plaintiff, a corporation engaged in the retail sale of ice cream, applied for a license to sell in the borough ice cream manufactured solely by a particular corporation. The wrappers for the ice cream, however, would not have had the name of the actual manufacturer inscribed thereon but instead would have been so labeled as to make it appear that the ice cream was manufactured by another concern at a stated address. The name of the latter concern was not the name of a corporation or of any individual person doing business under a fictitious name but was one that had been "assumed" or "adopted" by the actual manufacturer as a trade name in the sale of the particular ice cream which was proposed to be retailed by the plaintiff in the borough. In an action of mandamus brought by the plaintiff against the borough board of health to compel the issuance of a license, the board took the position that to issue a license under the circumstances mentioned would result in violations of the board's regulations.

The Supreme Court of Pennsylvania said that, specifically, the narrow question was whether or not the label intended to be used stated the name and address of the manufacturer of the ice cream and answered it by saying that it was clear that the assumed name did not name the manufacturer of the ice cream. "The use of this ficticious name is undoubtedly for the purpose of preventing the public from knowing the name of the real manufacturer, * * *. This is the very thing which the regulation of the board is intended to prevent. If such a practice were permitted it would defeat the purpose of the regulation, which is to prevent fraud or deception in the sale, by giving notice to purchasers of the identity of the manufacturer. Certainly this cannot be accomplished by a label or marker, which conceals the real name of the manufacturer, and gives in its place an assumed, fictitious name."

Passing on to what the appellate court said was the real question for determination, namely, whether the regulation was a reasonable and valid health measure, the court stated that it was of opinion that the regulation was neither arbitrary nor capricious and that it was a reasonable health measure designed to protect the public. In this connection it was said, among other things, that the rule was a common device to insure wholesomeness of a given product and was not peculiar to the board of health of the borough. The reasons for such a regulation were apparent as it was an impossibility to have every package of ice cream inspected before it was sold and, by having this type of regulation, the task of discovering the origin of defective products was made easier. Also it tended to make a manufacturer more careful in guarding against contamination if he knew that his name must appear on each product he offered to the public for consumption.

The fictitious concern had been licensed under a State statute as an ice cream plant operator by the State department of agriculture. This statute prohibited the sale of any ice cream which was falsely labeled as to the name and address of the manufacturer or which failed to disclose such name and address. The supreme court did not concede that the action of the department in granting the license was proper under the circumstances. After stating the statutory provisions the court said that "This makes it appear that the issue of the license to the plaintiff by the department of agriculture was a mistake, being in violation of" the statute. There was also pointed out another statute which prohibited the sale of ice cream, among other milk products, not bearing prominently the name and address of the manufacturer and the name and location of the milk plant in which manufactured.

Finally the court held that there was no merit in the plaintiff's contention that the license should be issued regardless of the validity of the board of health regulation inasmuch as the ice cream proposed to be sold would be identical with other ice cream sold by the actual manufacturer. According to the court the reason for the use of the proposed label, though a business one, was to conceal from the public the name of the manufacturer rather than to disclose it, and "Were such a practice permitted, there would be nothing to prevent irresponsible persons from engaging in the same type of fraud on the public with most serious consequences apt to follow. There is no compelling reason why a license should be granted to a seller of ice cream whose product is falsely labeled."

Swine—keeping—permit from local board of health.—(New Jersey Supreme Court; *Lichtman* v. *Board of Health of Deptford Township et al.*, 26 A.2d 503; decided June 3, 1942.) In a mandamus proceeding to compel a township board of health to issue a permit to the relator to keep swine on his farm it appeared that his application was refused because he had previously been convicted of keeping swine without a permit and because the board of health did not intend to issue more permits. These grounds were held by the Supreme Court of New Jersey to be without merit because the conviction involved no moral turpitude and because all the adjoining farms were operated as piggeries, there being 85,000 pigs in the township. The exclusion of relator, said the court, from this prevailing business was arbitrary and could in no way promote the public health, safety, and welfare.

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