

PUBLIC HEALTH REPORTS

VOL. 52

JUNE 4, 1937

NO. 23

SOME EXPERIMENTS WITH RATS AND RAT GUARDS¹

By O. E. DENNETY, *Surgeon, United States Public Health Service, Chief Quarantine Officer, The Panama Canal*

The migratory habits of rats for purposes of self preservation and propagation have been recorded in history and fiction, and the two instinctive urges are largely responsible for the presence of rats on shipboard.

The knowledge that rats and their parasites are carriers of disease has led to the practice of attempting to prevent rats from entering ships or from leaving alive once they have gone aboard. Among other means of entrance and egress, the ships' mooring lines are considered important avenues, and efforts have been made to render ships' hawsers impassable for rat traffic.

The barrier commonly accepted in present-day shipping circles as effective is a metal disk or cone fitted around the ship's mooring lines and placed several feet away from the side of the ship. No uniform design of rat guard has been internationally adopted; consequently, in the various ports of the world a variety of rat guards is found, some apparently effective and many obviously useless.

The ports of Cristobal and Balboa, at the Atlantic and Pacific ends of the Panama Canal, through which pass ships from nearly all ports of the globe, have offered opportunity to study many kinds of rat guards used by ships at dock or in fueling berths.

Assuming to be sufficient the dictum that "a rat guard shall be a minimum of 3 feet in diameter, shall fit snugly around the hawser, and shall be of metal sufficiently rigid to maintain the guard at right angles to the hawser", it is interesting to observe in how many ways a well-designed rat guard can be improperly set on a mooring line. A poorly designed or improperly made guard may sometimes be effectively set; more commonly, poorly designed and improperly set guards predominate on certain ships until the inspector presents the port requirements with sufficient emphasis.

Dependent upon the size of the ship, anticipated wind, tide, and current action, cables of various sizes are used; and while some rat guards are adjustable to cables of several sizes, many are not. Rarely

¹ Published with the permission of the Governor, The Panama Canal.

does a ship carry a variety of guards with the appropriate-sized cable holes; the results, therefore, are that a guard intended for a steel cable straddles a large hawser (pl. IV, figs. 1, 2, and 3), or the guard intended for a large hawser fits loosely about a small cable (pl. I, figs. 1-6); common deck practice is to stuff a rag in the opening or to tape the line to the proper size, neither of which expedients is generally satisfactory, as wind and ship movement soon dislodge the rag or the guard (pl. I, fig. 6).

The most frequently used rat guards are not designed effectively to surround two hawsers passing through the same hawse hole and leading to the same or adjacent bitts (pl. II, figs. 1 and 2), and rarely, even when properly set, do they withstand the "seesaw" action which tends to spread and warp the otherwise contacting leaves. Sometimes an effort is made to overcome this difficulty by placing two guards in contact on the lines, a solution which is not generally acceptable, since both guards tend to spread and a rat could easily pass through both of them.

A defect common to many guards is the absence of supporting arms or braces to maintain the guard at right angles to its hawser; the guard thus swinging freely, sooner or later becomes fouled and its axis lies nearly parallel to the cable it is supposed to protect (pl. I, figs. 1 and 2).

The accidents which are common to well-designed rat guards when in storage on ship, or when being installed on the lines, most frequently result in bending the leaves so that they do not properly approximate when on the hawser. The conscientious deck hand will correct the defect or report it to his superior.

While mooring lines are guarded to prevent rat traffic, comparatively few people have reported to have seen rats traveling on ships' lines (the writer has not met a ship's officer who related that he himself had seen a rat enter or leave a ship on a line). The purpose of this paper is to present illustrations of ineffective guards as seen on ships at first inspection in the Canal Zone, and photographic evidence of the behavior of the rat on cables and hawsers under conditions somewhat simulating ship and dock-side environment, omitting, unfortunately, that important, and indeed crucial element of darkness, under cover of which the rat does the most unexpected things.

OBSERVATIONS

Setting.—A ship's hawser was suspended between two trees, at about 5½ feet from the ground. At each end of the hawser was placed a Canal Zone standard 3-foot rat guard, to limit the field of observation. The rat guard under study was placed approximately midway and in the shade, in deference to the rat's alleged dislike for sunlight.

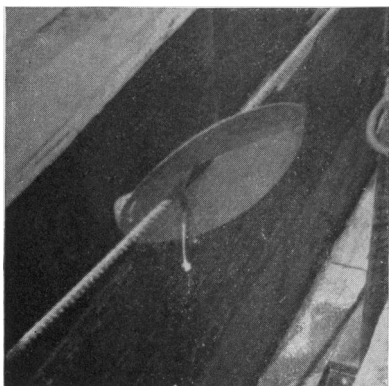


FIGURE 1.

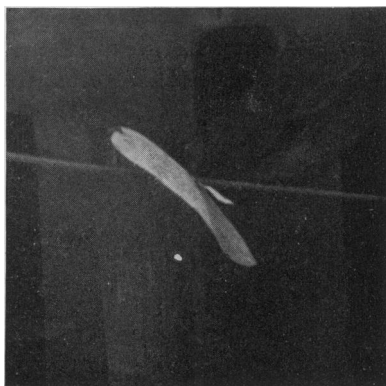


Figure 2.

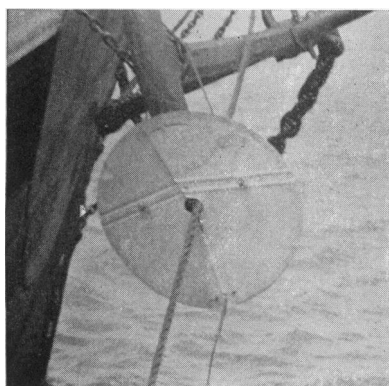


Figure 3.

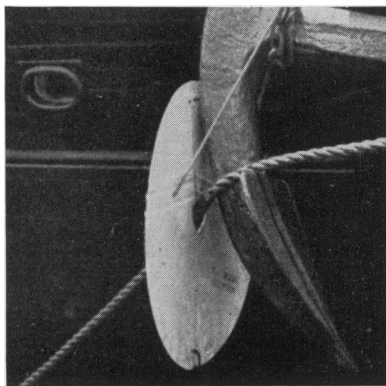


Figure 4.

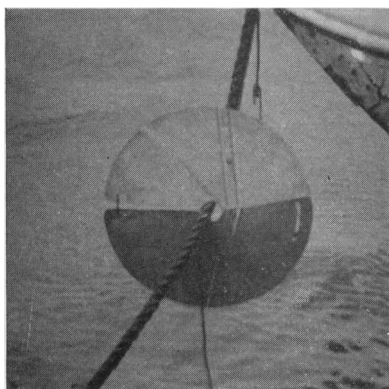


Figure 5.

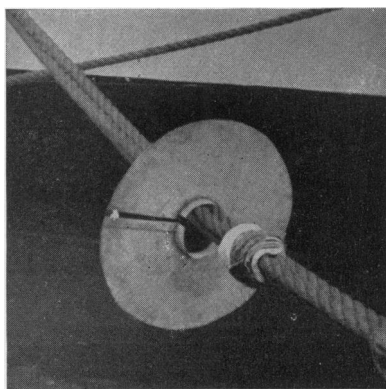


Figure 6.

FIGURE 1. A rat guard on a spring line between ship and dock. The lanyard has fouled, the guard leaves have become separated, and the guard lies upon the hawser almost parallel to it.

FIGURE 2. A rat guard, badly bent, with a 3-inch hawse hole, swinging freely on a steel cable.

FIGURE 3. Rat guard, with 3-inch cable hole, set upon a small hawser. The leaves are not completely closed and the guard is in contact with the anchor.

FIGURE 4. Same guard as shown in figure 3.

FIGURE 5. Guard with cable hole too large for line; leaves incompletely closed and dangling freely on stern line.

FIGURE 6. Large rat guard on three cables; the guard has slipped off the taping, which at first closed the hawse hole.

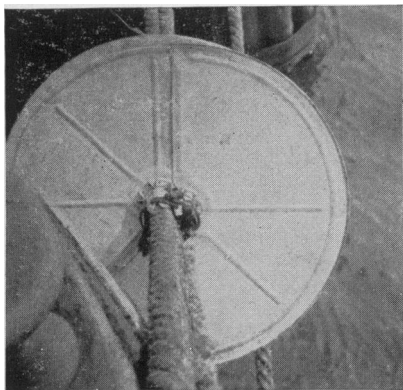


Figure 1.

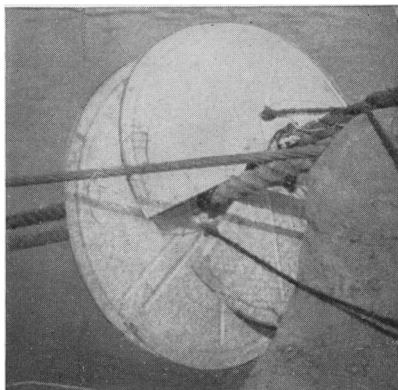


Figure 2.

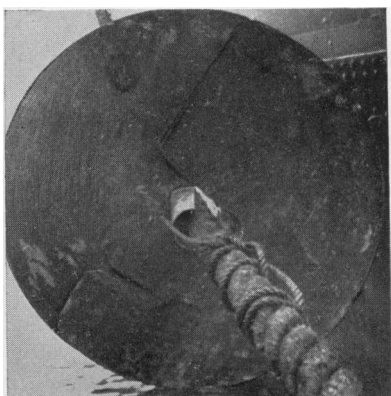


Figure 3.

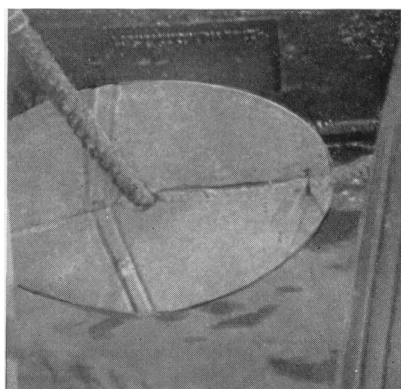


Figure 4.

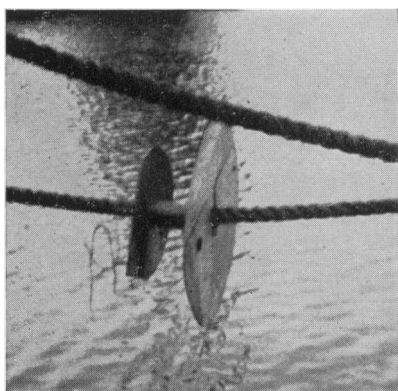


Figure 5.

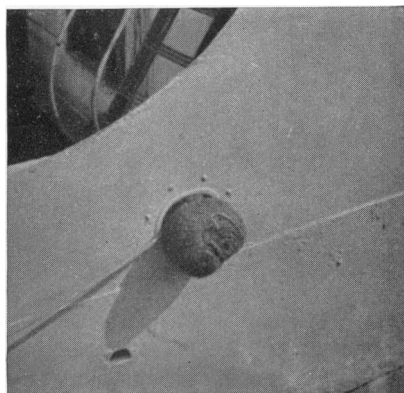


Figure 6.

FIGURE 1. Guard attached to two hawsers; the projecting arms, which would close the hawse hole on a single line, could not be completely closed around the two cables.

FIGURE 2. Two rat guards set upon two parallel hawsers. The hawse hole is not large enough to accommodate both lines, and the leaves cannot be closed.

FIGURE 3. Guard with projecting arms untied, leaving the hawse hole unguarded.

FIGURE 4. Rat guard on spring line between ship and dock. Hawse hole is too large, the leaves are not closed and when swinging in a nearly horizontal position the periphery of the guard contacted the dependent cable.

FIGURE 5. A rejected rat guard (left) and a Canal Zone guard (right) on the same hawser.

FIGURE 6. An improvised rat guard consisting of a lifeboat bumper stuffed in a hawse hole. Movement of the ship and the cable has dislodged the bumper.

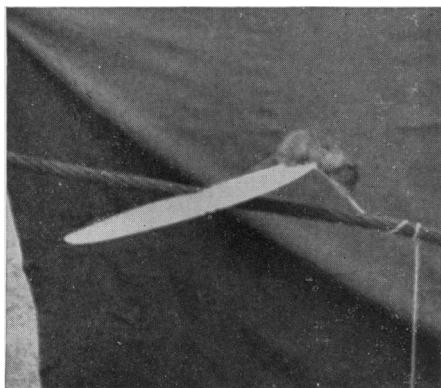


Figure 1.

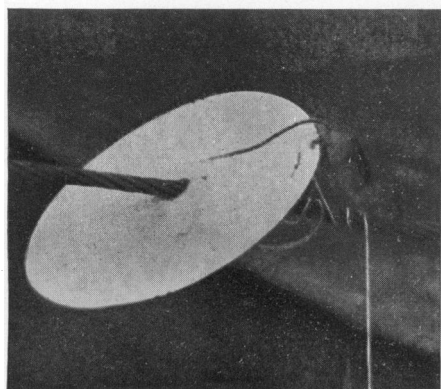


Figure 2.

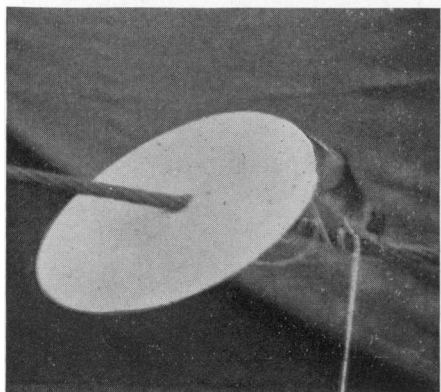


Figure 3.

FIGURES 1, 2, and 3. Rat readily passing across a tilted rat guard. (See pl. I, figs. 1 and 2.)

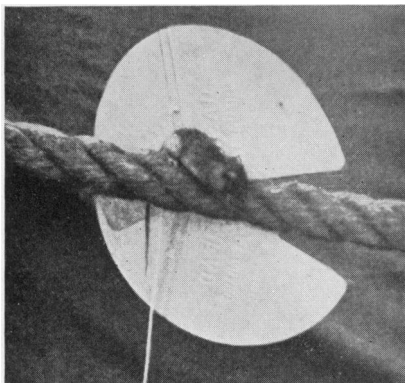


Figure 1.

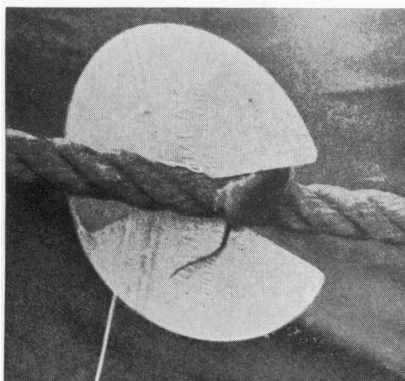


Figure 2.

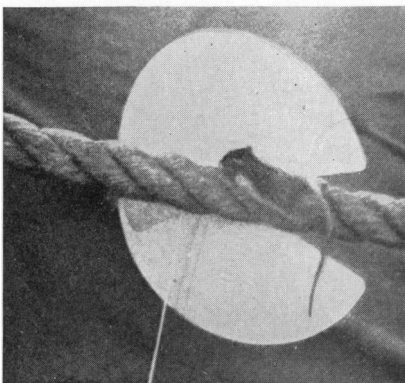


Figure 3.

FIGURES 1, 2, and 3. Rat passing back and forth through opening between leaves of a rat guard with cable hole too small to permit proper adjustment. (See pl. II, fig. 2.)

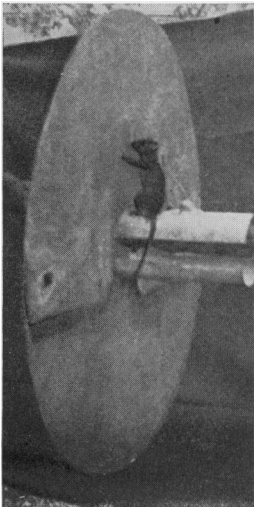


Figure 1.

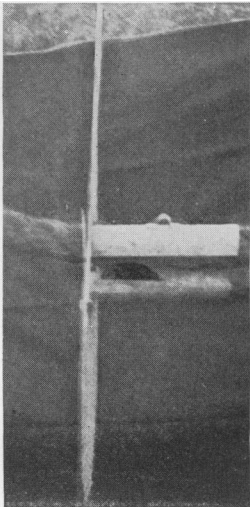


Figure 2.

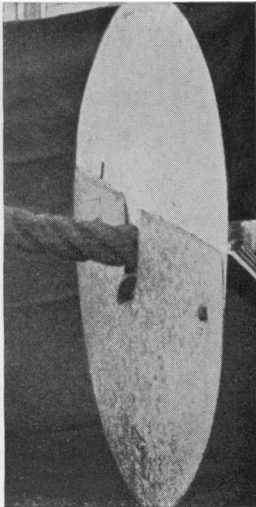


Figure 3.

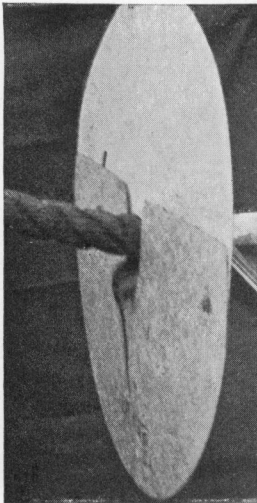


Figure 4.

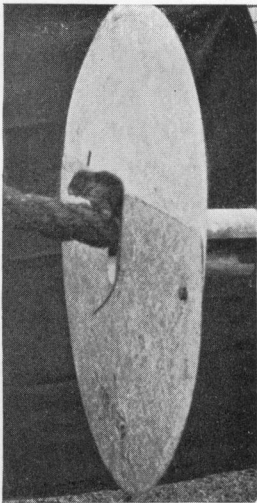


Figure 5.

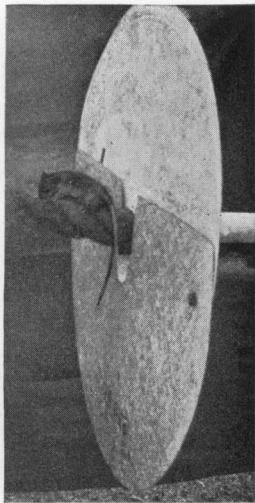


Figure 6.

FIGURES 1-6. Rat passing readily back and forth through a Canal Zone rat guard, with purposely unclosed hawse-hole guides. (See pl. II, fig. 3.)

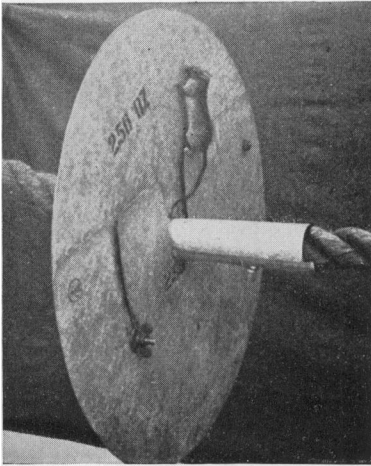


Figure 1.

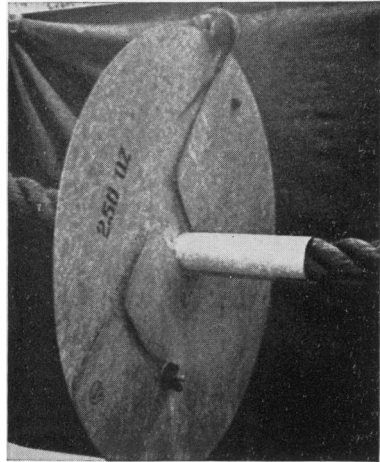


Figure 2.



Figure 3.

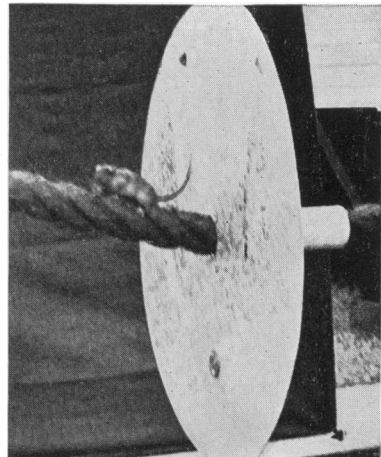


Figure 4.

FIGURE 1. Rat scaling a Canal Zone rat guard by climbing up the leaf edge.
FIGURE 2. Rat perched on the rim of the guard preparatory to leaping to the cable.
FIGURE 3. Rat in mid-air, in act of leaping.
FIGURE 4. Rat landing on cable, at instant of impact.

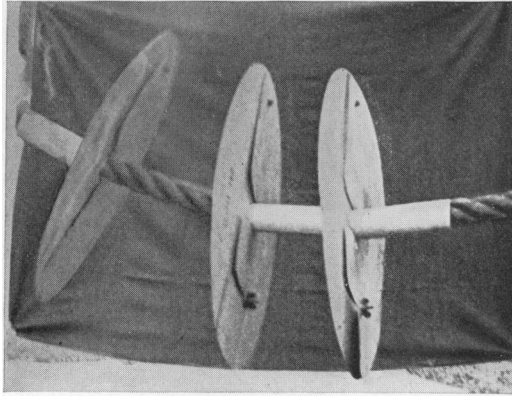


FIGURE 1. Three Canal Zone guards placed close together. The rat, when placed between the two right-hand guards, scaled the middle one and leaped 9 inches to the guard on the left.

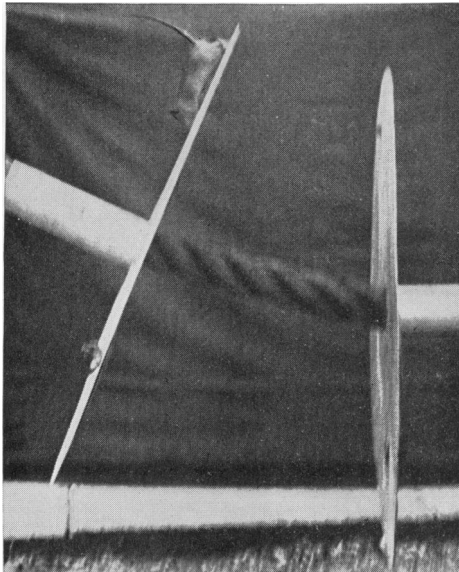


FIGURE 2. On the first leap, the rat jumped completely over the left guard, touched the cable, and fell to the ground. On a second trial, here shown, he slightly overjumped and slid safely to the cable. On the third and subsequent trials he landed on the rim of the guard, striking on his belly, checked his momentum with his hind legs, completed the descent at his leisure.

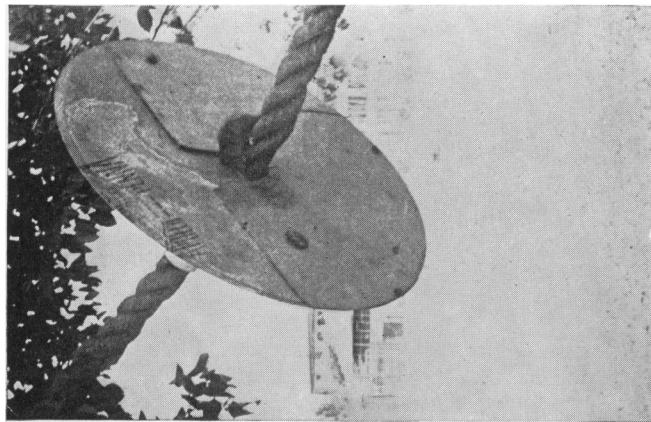


Figure 1.

FIGURE 1. Having learned to circumvent the 3-foot guards, the rat staged his temporary escape by scaling the guard after circling the cable several times in search for an opening around the cable.

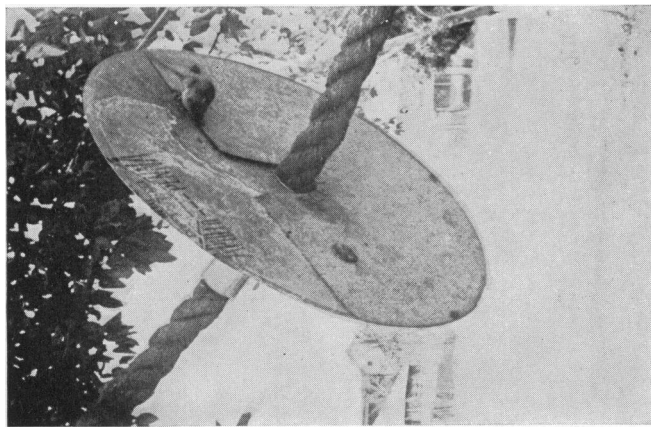


Figure 2.

FIGURE 2. Running back and forth on the edge of the guard leaf.

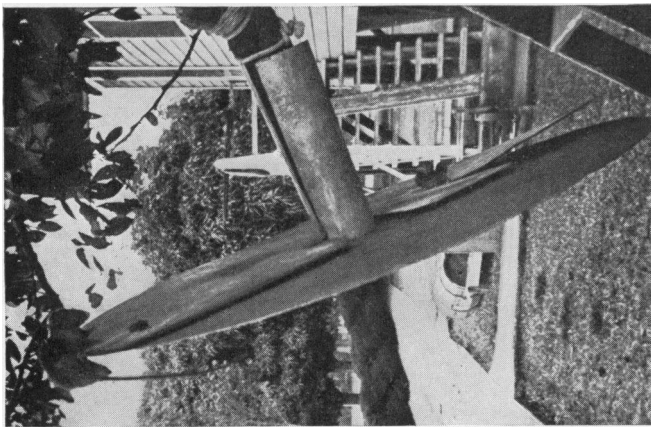


Figure 3.

FIGURE 3. Perched on the top of guard rim preparatory to a successful leap into the tree above, the nearest leaf of which was 6 inches over his head.

The rat was placed on the hawser, and performance was stimulated when necessary by tapping on one of the terminal rat guards with a stick; the noise was sufficiently alarming to cause the rat to make efforts to escape.

Observation No. 1 (pl. III, figs. 1, 2, and 3).—A rat guard with a large hawser hole was placed on a 1-inch steel cable, the lanyard was snarled and the guard was tilted to about the same angle as seen in plate I, figures 1 and 2. An adult, male, *Rattus alexandrinus*, when placed on the cable, unconcernedly passed back and forth over the rat guard, balancing himself appropriately as the guard tilted under his shifting weight.

Observation No. 2 (pl. IV, figs. 1, 2, and 3).—A rat guard with a small hawser hole ($1\frac{1}{2}$ inch) was placed on a $3\frac{1}{2}$ -inch hawser, leaving a triangular opening at the side, resembling the situation shown in plate II, figure 2. The rat passed through the guard repeatedly and without reference to the location of the triangular opening.

Observation No. 3 (pl. V, figs. 1 to 6).—A Canal Zone standard guard was placed on a $3\frac{1}{2}$ -inch hawser, and the adjustable hawser hole arms were purposely left partly open. The rat, after a rapid survey of the situation, entered the space below the cable and passed readily through the hawser hole.

Observation No. 4 (pl. VI, figs. 1 to 4).—A Canal Zone standard guard was properly set on the $3\frac{1}{2}$ -inch cable and the rat, after encircling the cable several times, apparently searching for the hawser hole through which he had previously passed, proceeded to climb the guard, and perched himself on top. After carefully washing his paws, he crouched and leaped from the rim of the guard to the hawser, making a perfect landing and proceeding to the next guard. Once the journey had been accomplished, the rat repeated the scaling of the guard, paying little attention to the position of the overlaps of the metal leaves, without which he could not have made the perpendicular climb.

Observation No. 5 (pl. VII, figs. 1 and 2).—Three Canal Zone standard guards were placed almost in apposition, and the rat was placed between two of them. He quickly scaled the middle guard and perched upon the rim. After a brief survey of the situation, and considerable paw washing, he made a leap for the outer guard, overshot his mark and fell to the ground. After a pause to permit himself to recover his poise, he was again placed between the same guards, and without hesitation again climbed to the rim of the middle guard; then, again, after repeating the circus performer's maneuvers, he made the leap—9 inches in the clear—and landed neatly on the rim of the outer guard, his momentum causing him to slide forward on his abdomen until checked by his hind legs. The descent from the rim to the cable was, as usual, a short, clean leap.

While the observers were discussing means of inducing the rat to jump two guards, the performer became his own director and proceeded to scale the last guard (pl. VIII, figs. 1 and 2); and then, with very little preliminary clowning (pl. VIII, fig. 3), he leaped to the branches of the tree (6 inches in the clear) and disported himself for a time unmolested.

SUMMARY AND COMMENT

For many years ships' mooring lines were protected from rat traffic by smearing tar on the hawsers. In more recent years some degree of protection has no doubt been obtained from metal disks or cones placed upon the hawsers, the theoretical efficiency of such guards obviously depending, to some extent, upon the manner in which the guard is set and maintained. The writer has seen improperly set and poorly designed and constructed rat guards in many ports, and submits photographs of some seen in routine port inspection in the Canal Zone.

That rats board ship by way of the mooring lines is difficult to demonstrate because the excursions are believed to be made under cover of darkness; but the fact has been accepted almost universally for centuries.

To determine the capacity of the rat to circumvent obstacles on hawsers, and to record his methods of approach, a photographic study was made. A male adult black rat was selected, as notoriously the best climber. The rat was introduced to his tasks by gradually making them more difficult; and it cannot be denied that he gained in experience as the observations continued. The ease, however, with which he crossed over a standard, rigid, 3-foot rat guard, caused, to say the least, considerable concern in the mind of the observer, and stimulated thought regarding the resourcefulness of this animal and the design and efficiency of rat guards.

CONCLUSION

A poor rat guard will not deter a rat, and the usually accepted type of guard probably will not deter a determined rat in the presence of an active migratory urge.

A NEW SPECIES OF THRASSIS (Siphonaptera)*

By WILLIAM L. JELLISON, *Assistant Parasitologist, United States Public Health Service*

A species of Siphonaptera represented by a large series of specimens from ground squirrels, *Citellus* spp., indigenous to several Western States, appears to be new and is described below.

* Contribution from the Division of Infectious Diseases, National Institute of Health, Rocky Mountain Laboratory, Hamilton, Mont.

*Thrassis pandorae*¹ n.sp.

Holotype, male, *allotype*, female, from *Citellus elegans*, P. & O. Ranch, Beaverhead County, Mont., deposited in the collection of the Division of Infectious Diseases of the National Institute of Health, Rocky Mountain Laboratory, Hamilton, Mont. There are numerous paratypes of both sexes collected by the writer from *C. elegans* in Beaverhead and Madison Counties and from *C. armatus* in Beaverhead County, Mont., and others collected by field crews of the San Francisco Plague Laboratory of the United States Public Health Service from *C. oregonus* in Grant and Wallowa Counties, Oreg., and by Laboratory Assistant E. W. Malone, of the Rocky Mountain Laboratory, from *Citellus* sp., in Natrona County, Wyo. Paratypes of both sexes have been deposited at the National Museum and the National Institute of Health, Washington, D. C., Stanford University, and the University of Minnesota.

Male and female.—Close to *Th. petiolatus* (Baker) 1904, but best distinguished by modified abdominal segments.

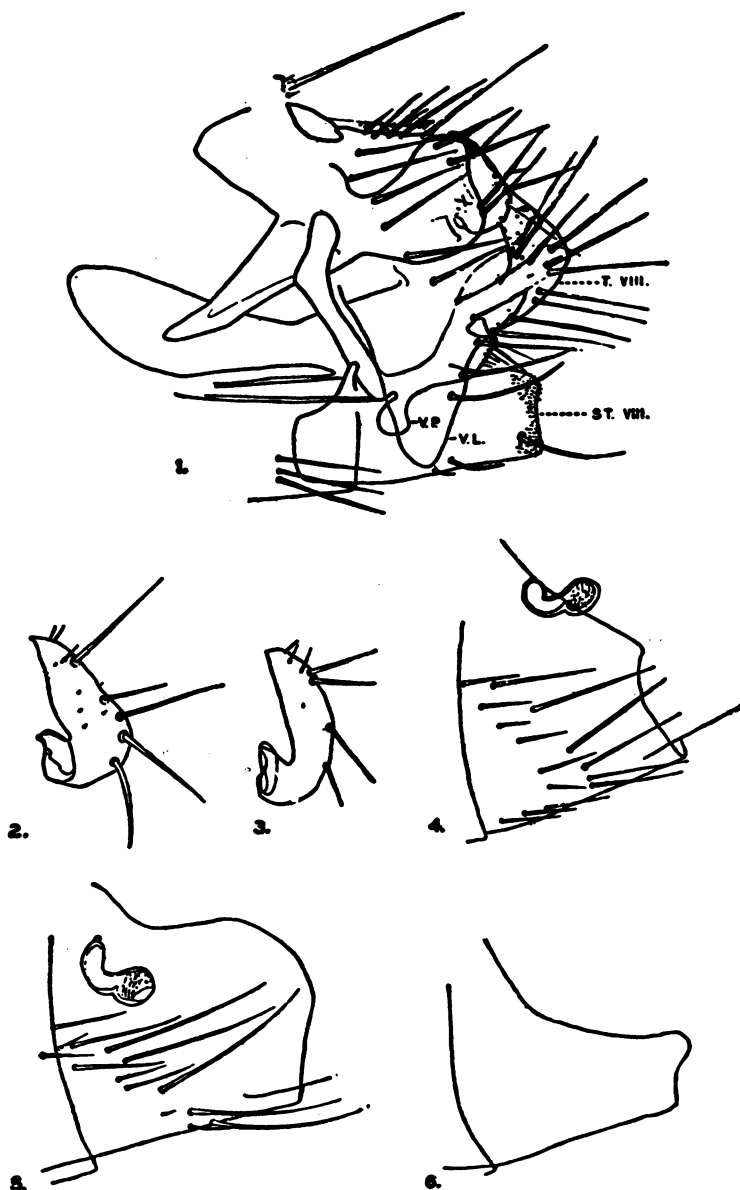
Head.—Frontal tubercle present, not prominent. Three bristles in oral row, middle one reduced and closest to upper bristle. Dorsal and ventral margins of antennal groove bordered with a row of minute setae. Row of long bristles on second segment of antenna. Rostrum 5 segmented and extending slightly beyond forecoxae.

Thorax.—Pronotal ctenidia of 15 spines. Outer surface of forefemur with fine lateral bristles, thin bristles on inside of mid and hind coxae from base to apex. Longest apical spine of segment 2 of hind tarsus reaching middle of segment 5. Five pairs of plantar bristles, all marginal.

Abdomen.—Typical abdominal tergites with two rows of bristles. One or two apical spinelets on tergites 1 to 4.

Male.—Antennal groove reaching to vertex of the head. The modified abdominal segments are illustrated in figure 1. Eighth tergite large, extending posteriorly beyond other modified segments, ventral lobe extending below eighth sternite in many specimens, narrower than in *petiolatus*. Bears a dorsal row of 7 to 9, a posterior marginal row of 10 to 12, submarginal group of 3 to 5, and anterior row of about 8 long bristles. Eighth sternite rectangular, three times longer than wide. Distal portion membranous and finely spiculate as found only in *petiolatus* of this genus. Posterior ventral corner distinctly angular and not rounded or dilated as in *petiolatus*. Posterior bristle on eighth sternite larger than in *petiolatus* and with two or more pairs of fine ventral bristles anterior to it in some specimens, especially in those from Oregon. The ninth sternite bears near its proximal

¹ The name is from classical mythology but is also appropriate as a contraction of P(oinDEXter) and O(r)r(igin) Ra(nch) the type locality of the species and locality where sylvatic plague was first discovered in Montana, July 12, 1935.



Explanation of Figures

FIGURE 1.—Genitalia of *T. pandorae* n. sp., male. T. VIII, eighth tergite; St. VIII, eighth sternite; V. L., ventral lobe of eighth sternite; V. P., ventral process of ninth sternite.

FIGURE 2.—Movable process of *T. pandorae* n. sp., male.

FIGURE 3.—Movable process of *T. petiolatus*, male.

FIGURE 4.—Seventh sternite of *T. pandorae* n. sp., female.

FIGURES 5 AND 6.—Dimorphic forms of seventh sternite of *T. petiolatus*, females.

ventral angle a ventral, obovate process which is present in *petiolatus* but more developed and rounded in this species. Movable process of clasper (fig. 2) with distal and proximal sides straight, apex acute,

inclined frontad, ventral margin rounded, distal margin bears several small and 5 medium bristles, lower two largest. Movable process in *petiolatus* (fig. 3) is longer, more crescentic, and narrower at base.

Female.—Head of receptaculum seminis ovate, tail one-half longer than head, with proximal half curved dorsally, bearing a small terminal appendage. Receptaculum is not distinguishable from that of *petiolatus*. The dorsal lobe of the seventh sternite (fig. 4) is angular, that of *petiolatus* is well rounded. Females of *petiolatus* are dimorphic in this respect as illustrated by Jordan.² Both types are redrawn (figs. 5 and 6) for convenient reference.

Although the type host of *T. petiolatus* is *Lynx canadensis*, the usual host is quite certainly *Citellus columbianus*, judged by several collections from the type area. In areas in Beaverhead County, where there is a mixed population of *C. elegans* and *C. columbianus*, these two closely related species of *Thrassis* occur on their respective hosts.

The Montana specimens were collected during 1935 and 1936, incident to sylvatic plague studies in the southwestern part of the State. *T. pandorae* was found to be the most abundant of the four species of fleas commonly found on Wyoming ground squirrels in the epizootic area. The Oregon specimens were also collected in epizootic areas. This species, therefore, is of interest as a possible vector of *Bacillus pestis*.

This flea was recognized as a new species by Mr. B. J. Collins, of the Division of Zoology, National Institute of Health, and through his courtesy is being described by the writer.

REPORT ON MARKET-MILK SUPPLIES OF URBAN COMMUNITIES

Compliance of the Market-Milk Supplies of Urban Communities With the Grade A Pasteurized and Grade A Raw Milk Requirements of the Public Health Service Milk Ordinance and Code (as Shown by Ratings of 90 Percent or More Reported During the Period Jan. 1–Apr. 30, 1937)

Following is a supplemental list of urban communities in which the pasteurized market milk is both produced and pasteurized in accordance with the Grade A pasteurized-milk requirements of the Public Health Service Milk Ordinance and Code, and in which the raw market milk sold to the final consumer is produced in accordance with the Grade A raw-milk requirements of said ordinance and code,

² Jordan, K.: On some problems of distribution, variability, and variation in North American Siphonaptera. Trans. Fourth International Congress of Entomology, Ithaca, N. Y., August 1928, vol. II, p. 489.

as shown by ratings of 90 percent or more reported during the period January 1, 1937, to April 30, 1937:

TABLE 1.—*Communities in which some market milk is pasteurized. In these communities the pasteurized market milk complies with the Grade A pasteurized milk requirements and the raw market milk complies with the Grade A raw-milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by pasteurized and raw milk ratings, respectively, of 90 percent or more*

[NOTE.—All milk should be pasteurized or boiled, either commercially or at home, before it is consumed]

Community	Percentage of milk pasteurized	Date of rating
Chicago, Ill.....	99.7	Jan. 22, 1937
Bryson City, N. C.....	50	Jan. 19, 1937
Durham, N. C.....	89	Apr. 3, 1937
Franklin, N. C.....	68	Jan. 20, 1937

TABLE 2.—*Communities in which no market milk is pasteurized, but in which the raw market milk complies with the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by raw milk ratings of 90 percent or more*

[NOTE.—All milk should be pasteurized or boiled, either commercially or at home, before it is consumed]

Community	Date of rating
North Wilkesboro, N. C.....	Nov. 11, 1936
Wilkesboro, N. C.....	Do.

For a detailed discussion of the significance of the milk sanitation ratings see Public Health Reports, vol. 52, no. 5, January 29, 1937 (pp. 130-133).

AGE OF GAINFUL FEMALE WORKERS IN DIFFERENT GEOGRAPHIC REGIONS OF THE UNITED STATES, 1920 AND 1930¹

Studies on the Age of Gainful Workers No. 3

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

INTRODUCTION

The previous paper of the series (1, 2) considered the age of gainful male workers in different geographic regions of the United States by occupational group for the census years 1920 and 1930. Regional differences with respect to the number of workers in specific occupational groups were found only in certain age groups; an ordering of the regions with respect to occupational group was, therefore, not possible. The picture for 1920 was, with a few exceptions, similar to that for 1930. The nine occupational groups, generally regardless of region, were observed to be classifiable into four categories depending upon

¹ From the Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service, Washington, D. C.

the particular age groups associated with excesses or dearths of workers, thus: (a) Agriculture, forestry, and animal husbandry showed an excess of workers in the early and late age groups and a dearth intervening; (b) extraction of minerals, manufacturing and mechanical industries, transportation and communication, and trade showed a dearth in the early and late age groups with an excess intervening; (c) public service, professional service, and domestic and personal service showed a dearth in the earlier age groups that gradually reached an excessive number in the late ages; and (d) the clerical occupations showed excesses in the early ages that were gradually replaced by a dearth in the older ages.

It is purposed in the present paper to investigate the relation of geographic location of the gainful female worker in different occupational groups to her age, and the effect upon this relation of the passage of 10 years.

The term *gainful worker* as used in this series of papers includes, according to the Bureau of the Census (§), " * * * all persons 10 years old and over who usually follow a gainful occupation even though they may not have been actually employed at the time the census was taken. It does not include women doing housework in their own homes without wages and having no other employment, nor children working at home, merely on general household work, on chores, or at odd times on other work."

As in the previous paper the 48 States and the District of Columbia have been divided into four broad groups, each group constituting a geographic region, as follows: Northeastern (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey and Pennsylvania), Southern (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma and Texas), North Central (Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska and Kansas), and Western (Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Nevada, Utah, Washington, Oregon and California).²

The present inquiry, like the previous ones, makes use of basic data published by the Bureau of the Census in its reports of 1920 and 1930.

FEMALE WORKERS IN DIFFERENT GEOGRAPHIC REGIONS BY OCCUPATIONAL GROUP

The number of gainful female workers in each geographic region and their distribution among nine occupational groups are shown for

² The four groups of States correspond to the nine groups used in the publications of the Bureau of the Census, thus: Northeastern—New England+Middle Atlantic, Southern—South Atlantic+East South Central+West South Central, North Central—East North Central+West North Central, and Western—Mountain+Pacific.

TABLE 1.—*Gainful female workers 10 years of age and over in different geographic regions of the United States, specific for occupational group, 1980 and 1950*

Occupational group	1980				1950			
	Number		Percent		Number		Percent	
	Northeastern	Southern	North Central	Western	Northeastern	Southern	North Central	Western
All groups.....	2,988,532	2,613,364	2,336,356	611,259	3,577,190	3,162,925	3,011,579	1,000,422
Agriculture, forestry, animal husbandry.....	29,088	631,811	93,347	29,882	22,614	771,500	82,743	23,411
Extraction of minerals.....	1,065,035	304,802	483,908	76,696	922,745	394,442	480,262	98,638
Manufacturing and mechanical industries.....	74,373	39,324	77,841	21,516	101,236	53,736	95,874	30,258
Transportation and communication.....	229,821	125,926	239,928	72,117	302,087	198,411	327,731	134,451
Trade.....	4,409	6,545	7,327	3,513	4,367	4,310	6,068	2,883
Public services (n. e. c.) ¹	316,913	224,673	358,693	116,219	481,359	355,079	494,803	194,963
Professional services.....	663,165	758,624	593,234	171,901	917,619	1,087,189	878,441	297,092
Domestic and personal service.....	604,824	220,745	481,331	119,206	824,935	306,070	645,392	256,423
Clerical occupations.....								
All groups.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture, forestry, animal husbandry.....	(¹)	35.7	4.0	4.9	(¹)	24.4	2.7	2.3
Extraction of minerals.....	36.6	11.7	20.7	12.5	25.8	12.2	16.0	9.9
Manufacturing and mechanical industries.....	2.6	1.5	3.3	3.5	2.8	1.7	3.2	3.0
Transportation and communication.....	7.7	4.8	10.3	11.8	8.4	6.3	10.9	12.4
Trade.....	.2	.3	.3	.6	.1	.1	.2	.3
Public services (n. e. c.) ¹	10.6	8.6	15.4	19.0	13.5	11.2	16.4	19.5
Professional services.....	22.2	28.0	25.4	28.1	25.7	34.4	29.2	29.7
Domestic and personal service.....	20.2	8.4	20.6	19.5	23.1	9.7	21.4	20.9
Clerical occupations.....								

¹ N. e. c.—not elsewhere classified.² Less than 1/10 of 1 percent.

1920 and 1930 in table 1. In 1920 the number of workers in the Northeastern, Southern, and North Central regions ranged between 2 and 3 millions, while in the Western region there were approximately 600,000. In 1930 the order of the regions is undisturbed, each region with the exception of the Western increasing to over 3 millions, and the Western reaching approximately a million.

When the occupational groups of each region are arranged in decreasing order of magnitude with respect to the percentages of workers engaged in the different groups, it will be seen that in 1920 the manufacturing and mechanical industries easily ranked first in the Northeastern region, claiming 35.6 percent of all the gainful female workers of that region; agriculture, forestry, and animal husbandry ranked first in the Southern region with 35.7 percent, a percentage well above the corresponding percentages for the other regions; and domestic and personal service ranked first in the North Central and Western regions with 25.4 and 28.1 percent, respectively. The lapse of 10 years effected small increases in domestic and personal service, this group of occupations ranking first in all regions in 1930, with the exception of the Northeastern, where the manufacturing and mechanical industries decreased sufficiently to become practically tied with domestic and personal service. In 1920 the percentages associated with domestic and personal service ranged from 22 to 29 percent; in 1930, from 26 to 34 percent.

Furthermore, in each region and for both census years the lowest ranking occupational groups were public service and extraction of minerals, the former ranking eighth and the latter last, in ninth place. The percentages for public service in 1930 were consistently less than the corresponding percentages for 1920; for both years the percentages for extraction of minerals were all 0.1 percent or less. It is of interest also to note that the clerical occupations approximated 20 percent in the Northeastern, North Central, and Western regions, respectively, while the same occupations accounted for 8 percent of the female workers in the Southern region; 10 years later there was a slight increase in these percentages.

FEMALE WORKERS IN DIFFERENT GEOGRAPHIC REGIONS BY AGE AND OCCUPATIONAL GROUP

The percentage age distribution of the gainful female workers in different geographic regions for 1920 and 1930 according to all occupational groups and for particular occupational groups, respectively, is shown in table 2.

Age distribution regardless of occupational group.—When the percentages constituting the age distributions of workers in all occupational groups, specific for region and census year, are arranged in decreasing order of magnitude certain notable facts are disclosed.

TABLE 2.—Age distribution of gainful female workers in different geographic regions of the United States, specific for occupational group, 1920 and 1930

Occupational group	Age group, 1920						Age group, 1930							
	10-17	18-19	20-24	25-44	45-64	65 and over	10-17	18-19	20-24	25-44	45-64	65 and over		
	Number	Percent					Number	Percent						
Northeastern														
All groups.....	2,988,532	10,961	9,977	22,041	39,571	15,417	2,033	3,577,190	6,827	9,974	23,092	41,144	16,674	2,289
Agriculture, forestry, animal husbandry.....	29,098	4,878	2,248	4,095	24,110	44,121	20,548	22,614	5,351	3,277	5,209	24,122	43,747	18,294
Extraction of minerals.....	21,029	10,840	13,647	35,704	15,884	2,796	2,796	22,278	13,158	11,842	14,035	34,211	22,807	3,947
Manufacturing and mechanical industries.....	1,045,035	17,017	11,380	29,916	36,538	12,944	1,225	922,745	12,365	12,854	21,488	37,659	14,370	1,755
Transportation and communication.....	74,373	13,761	18,372	33,069	29,283	3,286	1,277	101,236	9,365	15,760	31,822	38,149	5,012	1,392
Trade.....	229,821	11,814	10,065	20,452	41,777	14,556	1,316	302,087	6,659	9,748	19,785	43,193	18,919	1,693
Public service (n. e. c.) ¹	4,409	.658	2,019	10,887	52,075	31,438	2,903	4,367	.252	.641	7,076	48,532	41,012	5,198
Professional service.....	316,913	.974	4,618	25,196	52,069	16,810	1,333	491,369	7,723	4,675	24,863	48,532	18,429	1,748
Domestic and personal service.....	683,165	4,389	3,843	11,792	44,962	30,031	4,983	917,619	5,203	6,116	14,540	41,849	27,375	4,917
Clerical occupations.....	604,834	12,417	16,429	33,580	33,522	3,865	.187	829,935	8,824	14,269	34,126	39,425	6,080	.276
Southern														
All groups.....	2,613,364	15,021	8,103	18,519	39,636	15,982	2,739	3,162,978	10,014	7,542	19,772	42,318	17,827	2,527
Agriculture, forestry, animal husbandry.....	931,811	27,782	7,126	13,013	31,849	16,724	3,506	771,500	24,733	8,175	13,606	29,621	19,710	4,155
Extraction of minerals.....	914	12,910	8,972	19,475	44,838	12,144	1,641	1,188	18,085	10,106	14,894	43,617	12,768	.532
Manufacturing and mechanical industries.....	304,802	16,411	10,431	18,368	40,055	14,129	1,608	384,442	11,994	10,825	20,594	40,440	17,649	1,498
Transportation and communication.....	39,324	16,667	19,652	21,243	28,013	3,906	1,336	63,736	7,747	13,863	31,968	40,235	10,342	.540
Trade.....	128,926	9,785	9,861	21,243	45,006	22,980	1,155	196,411	6,137	8,064	19,168	46,770	19,313	1,550
Public service (n. e. c.) ¹	6,545	1,253	3,392	15,447	55,569	22,108	2,231	4,310	.557	.766	10,626	56,798	28,684	2,999
Professional service.....	224,673	1,778	8,792	33,923	44,728	9,857	9,922	355,079	5,445	4,937	31,792	48,705	12,867	1,184
Domestic and personal service.....	758,624	6,320	5,949	15,407	46,667	21,889	3,868	1,087,189	6,212	5,892	16,061	47,513	22,241	3,081
Clerical occupations.....	220,745	7,125	13,134	33,216	41,096	5,042	.387	308,070	2,552	9,342	31,875	48,064	7,817	.860

Thus, in each region and for both census years, the three ranking age groups are the same and have the same order. These age groups, together with their lower and upper limits irrespective of region and census year, are 25-44 (40 to 47 percent), 20-24 (19 to 23 percent), and 45-64 (middle-aged, 15 to 23 percent); in each instance the upper limit is yielded by the year 1930. The remaining age groups, with the exception of the Southern child group (10-17) for 1920, have less than 11 percent. In 1920 the Southern child group yielded 15 percent, decreasing in 1930 to 10 percent; the corresponding percentages for the Northeastern region read 11 and 7 percent, respectively; the North Central, 9 and 5, and the Western, 5 and 2. It is noteworthy that the old-aged group (65 and over), generally ranking last among the different age groups, was represented by between 2 and 3 percent of the workers regardless of region and census year.

Age distribution by occupational group.—It is now pertinent to ask what the order is of the various occupational groups in each age group, how the regions compare, and what the effect is of the passage of 10 years. The questions are asked primarily with respect to the child, middle- and old-aged groups, respectively.

In 1920, according to table 2, all of the occupational groups of the Western region yielded fewer than 10 percent of their numbers to the child group, transportation and communication furnishing almost 10 percent of its workers; 10 years later all of the percentages were less than 8 percent, transportation and communication declining to less than 2 percent, with agriculture, forestry, and animal husbandry holding first place (7.9 percent). In 1920 the Northeastern region yielded five occupational groups, each with more than 10 percent in the child group, while the Southern and North Central regions each showed four groups with more than 10 percent. Ten years later the Northeastern region showed only two occupational groups with more than 10 percent in the child group, the Southern showing three and the North Central none. The largest percentage in the child group was 28 percent associated with agriculture, forestry, and animal husbandry of the Southern region in 1920. The lowest percentages (less than 2 percent) in each region and census year were given by professional service and public service, respectively. In general, the percentages in the child group of 1930 for each region were less than the corresponding ones of 1920; the largest decrease was approximately 10 points, which was associated with transportation and communication in the Southern and North Central regions, respectively.

In 1920 the middle-aged group, 45-64 years, showed, with the exception of the Southern region, agriculture, forestry, and animal husbandry to hold first place, ranging from 39 to 44 percent, depending upon the geographic location of the worker; in the Southern region public service claimed first place with 22 percent. In 1930

these percentages, in general, increased slightly without any change in their relative order. It is noteworthy that domestic service held second place or a position very close to second in all regions and in both census years, while clerical occupations and transportation and communication claimed the lowest places. In general, the percentages in the middle-aged group of 1930 for all regions were greater than the corresponding ones of 1920; the largest increases, approximately 10 points, were connected with public service in the Northeastern and North Central regions, and with extraction of minerals and trade in the Western region.

With respect to the old-aged group, 65 years and over, agriculture, forestry, and animal husbandry generally ranked first among the occupational groups in each region and for both census years. With the exception of the Southern region, the percentages for this group (9 to 20 percent) ranked well above the percentages for the groups in second place. Moreover the percentages for 1930 for all occupational groups were generally slightly higher than the corresponding ones for 1920. With the exception of agriculture, forestry, and animal husbandry, all percentages, regardless of region and census year, were 6 percent or less, with the clerical occupations and transportation and communication generally ranking lowest.

**RATIO OF OBSERVED PERCENTAGE OF GAINFUL FEMALE WORKERS IN
EACH OCCUPATIONAL GROUP TO THE EXPECTED OR NORMAL PER-
CENTAGE**

The percentage age distribution of all gainful female workers, regardless of occupation but specific for region and census year, may be assumed to be the "expected" or "normal" percentage age distribution for each occupational group specific for region and census year. As a consequence of this assumption eight expected or normal age distributions emerge, each corresponding to a particular region and census year, and the ratios of the observed percentages to their corresponding expected percentages will disclose whether there is a relatively large, a relatively small, or a normal percentage of workers of a particular occupational group in a specific age group of a particular region and census year.

Reference to the expected or normal percentages has already been made in the previous section. Table 3 presents the calculated ratios, and figures 1 and 2 show them graphically. The broken line in each figure drawn through 1.00 indicates the normal or expected level of gainful workers. When the percentage of persons actually observed in a particular age and occupational group for a region is the same as the expected percentage, the bar will reach the broken line. Obviously when the height of a bar is below (or above) the normal level the

TABLE 3.—Ratio by age and geographic region of the United States of percentage of gainful female workers in a specified occupational group to the percentage for all groups 1920 and 1930 (percentages shown in table 2)

Occupational group	Age group, 1920					Age group, 1930						
	10-17	18-19	20-24	25-44	45-64	65 and over	10-17	18-19	20-24	25-44	45-64	65 and over
	Northeastern						Northeastern					
Agriculture, forestry, animal husbandry.....	0.45	0.23	0.19	0.61	2.86	10.11	0.78	0.33	0.23	0.59	2.62	7.99
Extraction of minerals.....	1.92	1.09	.62	.90	1.03	1.38	1.93	1.19	.61	.83	1.37	1.72
Manufacturing and mechanical industries.....	1.55	1.14	.95	.92	.84	.60	1.81	1.24	.93	.92	.86	.77
Transportation and communication.....	1.26	1.84	1.59	.74	.21	.11	1.37	1.98	1.36	1.05	.30	.17
Trade.....	1.08	1.01	.93	1.06	.65	.65	.98	.98	.86	1.05	1.13	.74
Public service (n. e. c.).....	.06	.20	.49	1.32	2.04	1.43	.04	.06	.31	1.11	2.46	2.27
Professional service.....	.09	.46	1.14	1.32	1.03	.66	.11	.47	1.08	1.20	1.11	.76
Domestic and personal service.....	.40	.39	.54	1.14	1.95	2.45	.76	.61	.63	1.02	1.64	2.15
Clerical occupations.....	1.13	1.65	1.52	.85	.25	.09	.85	1.43	1.48	.96	.36	.12
	Southern						Southern					
Agriculture, forestry, animal husbandry.....	1.85	0.88	0.70	0.80	1.05	1.28	2.47	1.08	0.69	0.70	1.11	1.64
Extraction of minerals.....	.86	1.11	1.05	1.13	.76	.60	1.81	1.34	1.03	.75	.72	.21
Manufacturing and mechanical industries.....	1.03	1.29	.99	1.01	.88	.69	1.20	1.44	1.04	.96	.82	.59
Transportation and communication.....	1.11	2.43	1.70	.71	.24	.12	.67	1.84	1.60	.95	.45	.21
Trade.....	.65	1.22	1.15	1.14	.81	.42	.61	1.07	.97	1.11	1.08	.61
Public service (n. e. c.).....	.08	.42	.83	1.40	1.38	.81	.06	.10	1.10	1.15	1.61	1.03
Professional service.....	.12	1.09	1.83	1.13	.62	.34	.05	.65	1.61	1.16	1.45	.45
Domestic and personal service.....	.42	.72	.83	1.18	1.37	1.41	.52	.78	.81	1.12	.72	1.22
Clerical occupations.....	.47	1.62	1.79	1.04	.32	.14	.25	1.24	1.61	1.14	.44	.14

	North Central					North Central				
	Western					Western				
Agriculture, forestry, animal husbandry.....	1.48	0.38	0.30	0.64	2.78	6.34	1.28	0.38	0.24	0.83
Extraction of minerals.....	1.83	1.33	.92	.84	.74	.68	2.08	1.27	1.24	.67
Manufacturing and mechanical industries.....	1.61	1.10	.83	.87	.67	.69	1.56	1.26	.95	.93
Transportation and communication.....	1.72	1.77	1.38	.76	.25	.12	1.37	1.62	1.87	.43
Trade.....	1.19	1.01	.82	1.10	.84	.85	1.11	1.00	.82	.71
Public service (n. e. c.).....	.04	.24	.62	1.42	1.57	.85	.04	.04	.42	2.01
Professional service.....	.13	.79	1.48	1.16	1.73	.41	.12	.89	1.26	.84
Domestic and personal service.....	.78	.64	1.63	1.03	1.99	1.69	1.27	.81	.96	1.68
Clerical occupations.....	1.12	1.51	1.47	.91	.22	.07	.79	1.88	1.47	.83
Agriculture, forestry, animal husbandry.....	1.48	0.38	0.32	0.76	2.04	4.18	3.30	0.57	0.31	0.83
Extraction of minerals.....	1.83	.94	.81	1.07	1.15	1.48	1.71	1.30	.54	.82
Manufacturing and mechanical industries.....	1.61	2.60	.64	.99	1.28	1.04	1.28	1.70	.77	.95
Transportation and communication.....	1.98	1.77	1.77	.71	.17	.08	.71	1.03	1.61	.36
Trade.....	1.30	1.20	.95	1.05	.82	.64	.68	1.04	.83	.75
Public service (n. e. c.).....	.01	.20	.54	1.27	1.43	.78	.34	.07	.38	1.19
Professional service.....	.21	.67	1.24	1.15	1.81	.69	.23	.97	1.13	1.52
Domestic and personal service.....	.65	.47	1.49	.99	1.81	1.66	1.47	.91	.68	.89
Clerical occupations.....	1.67	1.66	1.67	.96	.25	.10	.61	1.45	1.59	.36

1 N. e. c.=not elsewhere classified.

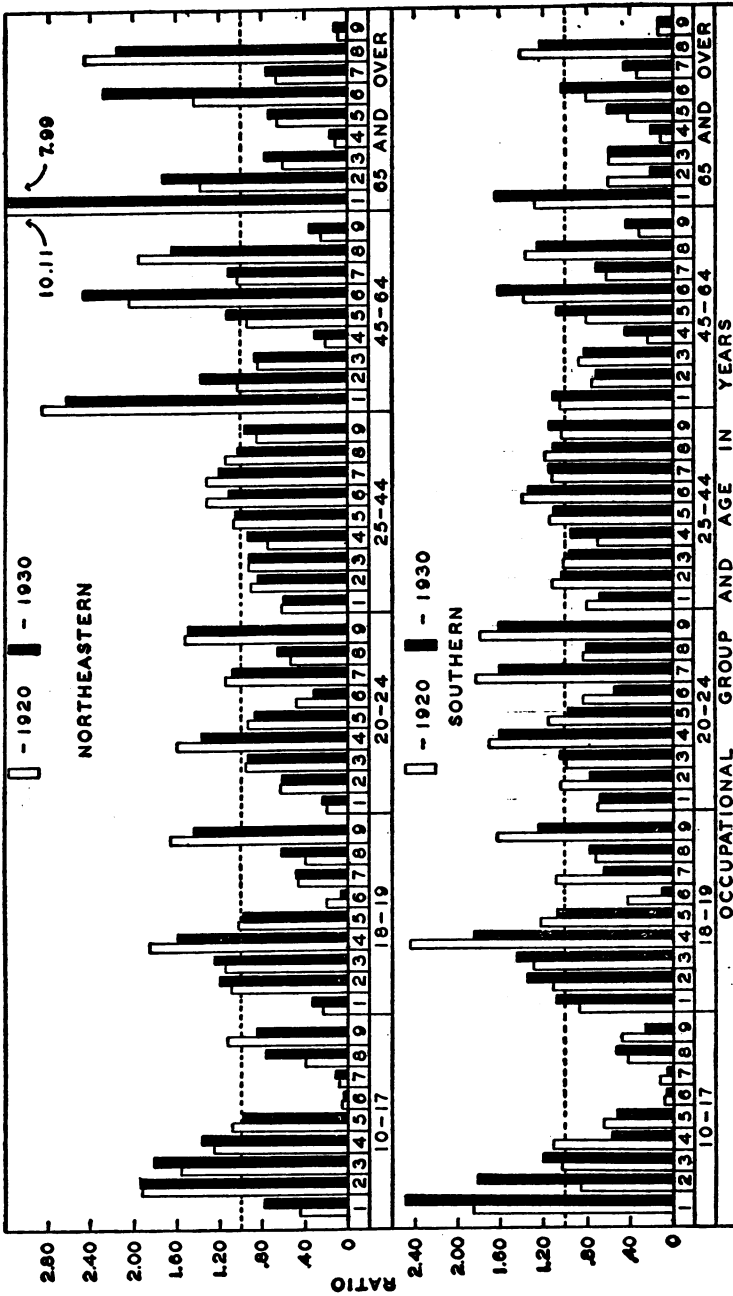


FIGURE 1.—Age-specific ratios of the percentages of gainful female workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930. The numbers 1-9 are defined thus: 1, agriculture, forestry and animal husbandry; 2, extraction of minerals; 3, manufacturing and mechanical industries; 4, transportation and communication; 5, trade; 6, public service (not elsewhere classified); 7, professional service; 8, domestic and personal service; and 9, clerical occupations.

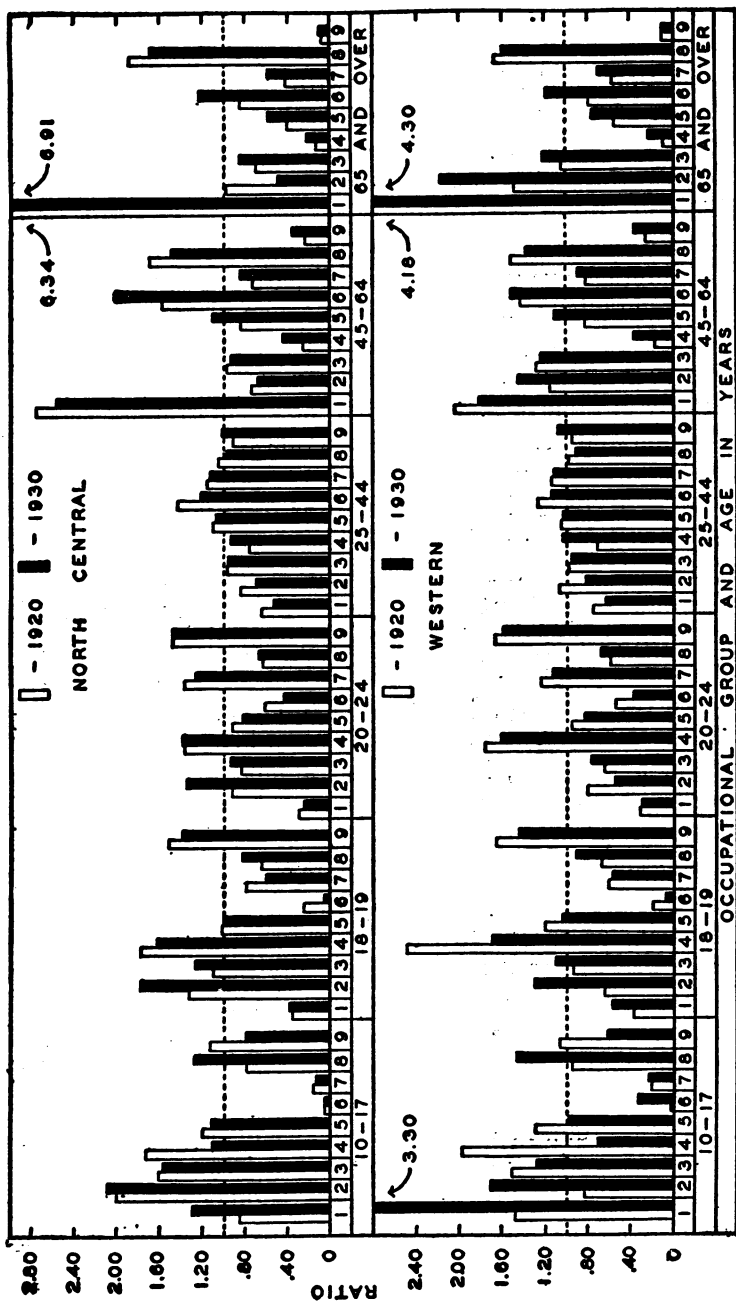


FIGURE 2.—Age-specific ratios of the percentages of gainful female workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930. The numbers 1-9 are defined thus: 1, agriculture, forestry and animal husbandry; 2, extraction of minerals; 3, manufacturing and mechanical industries; 4, transportation and communication; 5, trade; 6, public service (not elsewhere classified); 7, professional service; 8, domestic and personal service; and 9, clerical occupations.

percentage of persons for the age group and group of occupations represented by the bar is less (or greater) than the percentage expected.

An examination of the matter of normality will throw light on the important question of whether there is, with respect to occupational group, a dearth of workers in the middle-aged and old-aged groups, and an excess in the child group, and how the regions and census years compare in these respects.

Variability of the ratios in the different age groups.—An inspection of figures 1 and 2 discloses an extraordinary lack of stability among the ratios in the different age groups when compared with the male data presented in the previous paper, the phenomenon varying from region to region and from census year to census year. Of interest is the order of the different age groups, specific for region and census year, in this regard. A study of table 3, together with the use of graphs ³ showing, specific for region and census year, the fluctuations of the ratios with age, reveals the age group 25-44 to be least variable; the range of variability for 1920, regardless of region, was from 0.6 to 1.4, and for 1930, from 0.5 to 1.6, the regional differences being slight. In each region and in both years the age group 20-24 followed 25-44. The Northeastern and North Central regions are the only regions showing the same order; in both years this order was 25-44, 20-24, 18-19, 10-17, 45-64, and 65 and over. With the exception of the Southern, the regions showed the age group 65 and over to have the greatest variability and in both years, the great variability being effected by the contribution of agriculture, forestry, and animal husbandry; in the Southern region the greatest variability was shown by the age group 18-19 in 1920 and by the age group 10-17 a decade later. In no region as in the instance of the males is it possible to order the age-distributed occupational groups with respect to the magnitude of the ratios.

Age changes in the ratios; specific occupational groups of different regions compared.—Figure 3 shows graphically how the age changes in the ratios for each of three occupational groups compare with respect to region; figure 4 shows the same for the six remaining groups. In both figures the points corresponding to successive ratios have been joined to facilitate reading. The figures reveal that, first, the ratios of no occupational group lie consistently above or below the expected or normal level of workers; second, the regional ratios for a specific occupational group are in many instances similar for specific age groups; third, the trends of the ratios for 1930 are similar to the trends of the corresponding ratios of a decade earlier, with the exception of extraction of minerals (Southern and Western regions); and, finally, the regions cannot be ordered with respect to the ratios of any occupational group. The trends of the regional ratios will be examined

³ The graphs are omitted.

subsequently; attention will be directed to exceptional deviations from a trend laid down for a specific occupational group, and to any striking regional differences in specific occupational and age groups.

A particular regional-specific occupational group may be generally assigned to any one of four categories depending upon the movement of the trend of the group with age. These categories are based upon the early, intermediate, or late appearance on the age scale of excesses and dearths of workers. Thus, (1) an excess may be early and late with a dearth intervening, (2) a dearth may be early and late with an excess intervening, (3) a dearth may gradually become an excess, or (4) an excess may gradually become a dearth. The curve associated with the first category is U-shaped; with the second, inverted U-shaped with the third, a line with an ascending slope; and with the fourth, a line with a descending slope. A particular occupational group may be assigned to a specific category when each of its four regional curves is assignable to that category. A study of figures 3 and 4, however, discloses that the majority of the occupational groups behave differently in the different regions and, hence, when the geographic location of the worker is disregarded, these particular groups fail to lend themselves to the simple process of classification as described. This condition contrasts remarkably with that of the males whose occupational groups were more amenable to the indicated process of classification.⁴

With the exception of the Northeastern region in 1920 and in 1930, and the North Central in 1920, agriculture, forestry, and animal husbandry may be assigned to the U-shaped category as in the instance of the males. The striking feature of this set of curves is, in general, the unusually large excess of workers in the older age groups.

Extraction of minerals, engaging a relatively small number of females, is represented by a set of curves very unlike the corresponding ones for the males. Both years are heterogeneous, 1930 showing more regularity. Thus in 1930 the Northeastern and Western regions are definitely U-shaped, while the North Central and Southern regions show declining trends.

The manufacturing and mechanical industries, with the exception of the Western region, shows a declining trend in both years. The Western region may be represented by a U-shaped curve with excesses in the child and older age groups and dearths intervening.

Transportation and communication for both years shows excessive numbers in the early ages, particularly in the age group 18 to 19, the excesses gradually becoming more and more subnormal. In general this occupational group may be assigned to the category represented by a line with a declining slope. The exceptions occur in 1930, when the Southern and Western regions disclose a subnormal number of children.

⁴ See introduction to this paper.

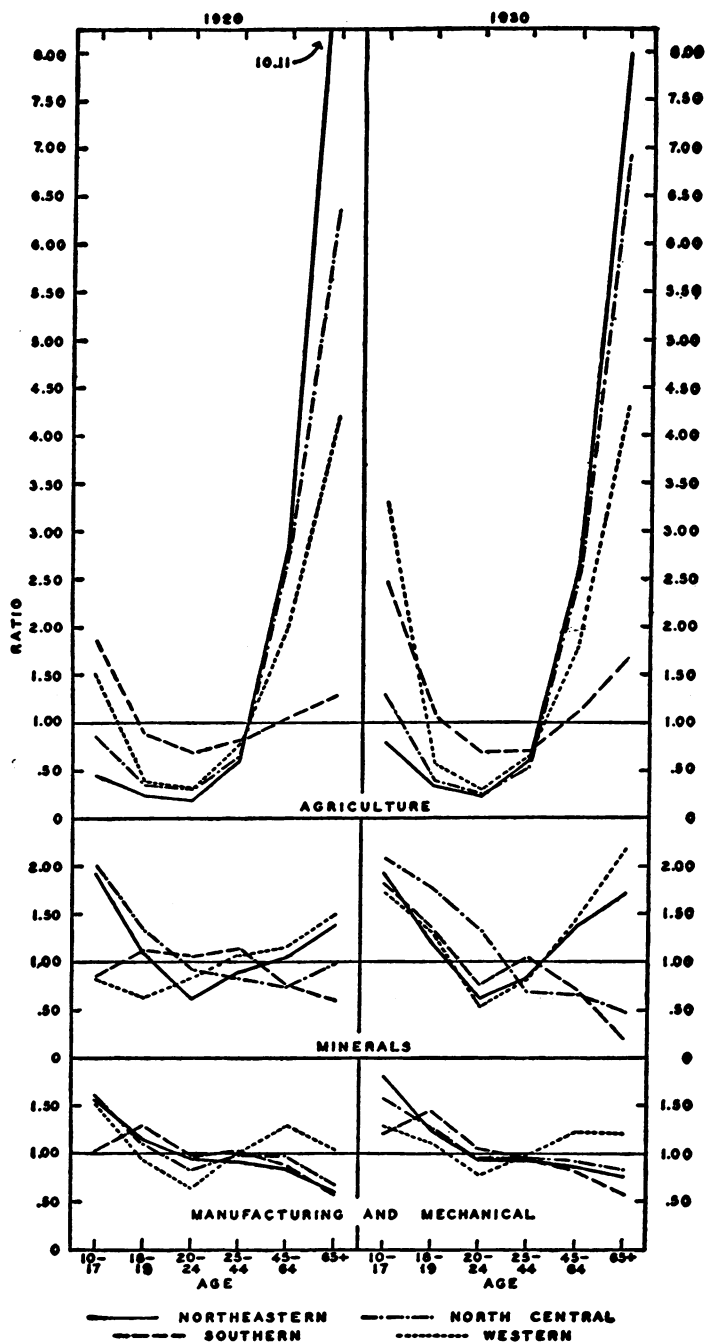


FIGURE 3.—Age-specific ratios of the percentages of gainful female workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930; specific occupational groups of different regions compared. (Agriculture, forestry and animal husbandry is abbreviated agriculture, while extraction of minerals reads minerals. Points representing ratios specific for region are joined by straight lines to facilitate reading.)

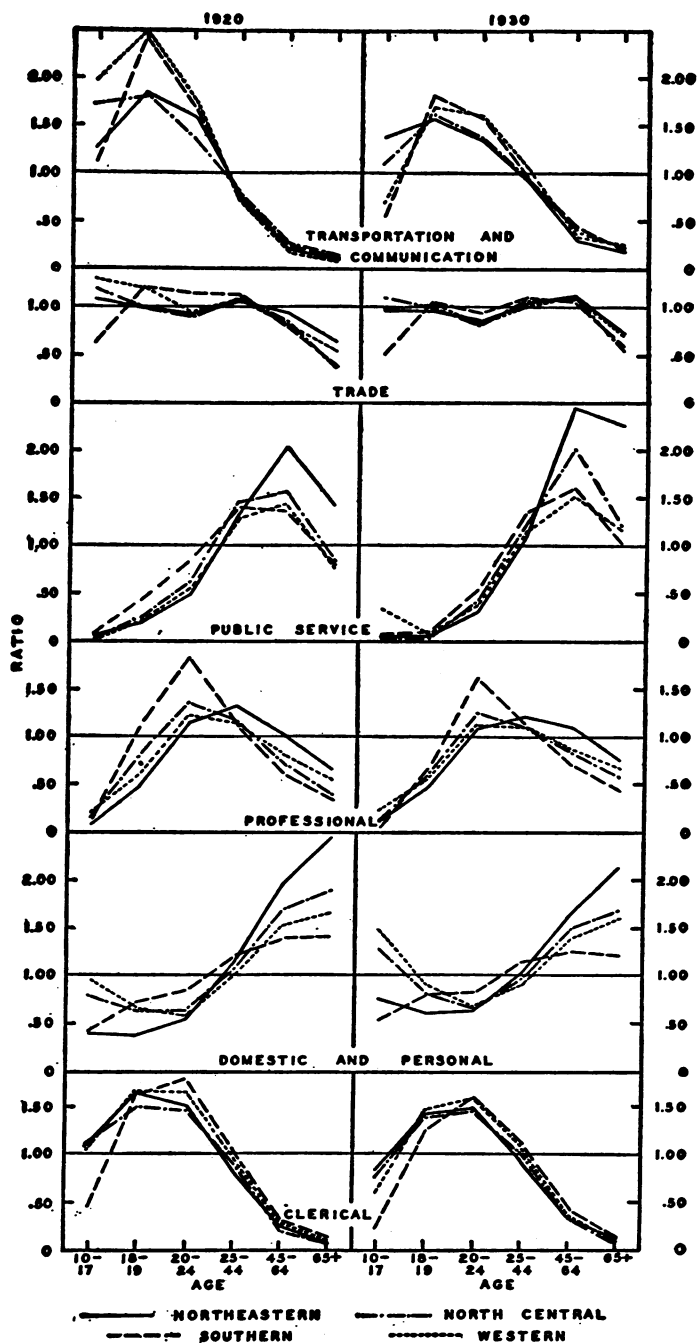


FIGURE 4.—Age-specific ratios of the percentages of gainful female workers in different occupational groups to the percentages for all groups, by geographic region, 1920 and 1930; specific occupational groups of different regions compared. (Points representing ratios specific for region are joined to facilitate reading.)

Trade generally shows a declining trend in both years, with the exception of the Southern region, which shows a subnormal number of children and a dearth in the older ages.

Public service behaves similarly in both years. There is a gradual increase in both years from subnormality in the early-age groups to a maximum excess in the middle-aged group. A definite decline follows, which, in 1920, Northeastern region excepted, is sufficiently great to produce a sensible dearth in the old-aged group.

The professional service group is definitely inverted U-shaped in both years with dearths in the early and late ages and excesses intervening. The dearths in the older ages are striking when compared with the excesses shown by the corresponding ratios of the males.

Domestic and personal service shows, in general, increases in both years from subnormality in the early age groups to excesses in the older groups. The Western and North Central regions in 1930 are the exceptions in that excesses are shown in the child group.

Clerical occupations in 1930 behave similarly, with a subnormal number of children, dearths in the older age groups, and excesses intervening. Ten years previously all of the regions with the exception of the Southern showed excesses in the child group.

The regional comparisons of specific occupational groups set down immediately above contain a sufficient number of exceptions to generalizations to justify a further examination of figures 3 and 4 with respect particularly to excesses in the child group (10-17), and dearths in the middle-aged (45-64) and old-aged (65 and over) groups, respectively. The matter is clarified with the aid of a tabulation such as that shown in table 4 which considers only the direction of the deviations from normal and not the magnitude of such deviations.

An examination of the table as a whole shows that the 18 excesses associated with the child group in 1920 became 16 in 1930; that the 20 subnormal ratios of the middle-aged group became 16, and that the 24 subnormal ratios of the old-aged group became 21.

With respect to the child group the table shows in all regions that the manufacturing and mechanical industries had excesses in 1920 as well as in 1930, transportation and communication had excesses in 1920 that vanished 10 years later in two of the regions, namely, the Southern and the Western, and extraction of minerals had excesses in 1930. A reader interested in the abolishment of child labor would observe, first, that the clerical occupations fared best with the passage of 10 years, all excesses of the different regions in 1920 becoming dearths in 1930; and, second, that the region that fared best was the Northeastern, two of its five excesses becoming dearths (trade and clerical occupations). On the other hand, the five excesses of the North Central region in 1920 became six in 1930.

TABLE 4.—Excesses and dearths of female workers in 3 important age groups, by geographic region and occupational group, 1920 and 1930 (from figs. 3 and 4)¹

Occupational group	Age group, 1920						Age group, 1930					
	10-17			45-64			10-17			45-64		
	Northeastern	Southern	North Central	Western	Northeastern	Southern	North Central	Western	Northeastern	Southern	North Central	Western
Agriculture, forestry, animal husbandry.....	+	+	+	+	+	+	+	+	+	+	+	+
Extraction of minerals.....	+	+	+	+	+	+	+	+	+	+	+	+
Manufacturing and mechanical industries.....	+	+	+	+	+	+	+	+	+	+	+	+
Transportation and communication.....	+	+	+	+	+	+	+	+	+	+	+	+
Trade.....	+	+	+	+	+	+	+	+	+	+	+	+
Public service (n. e. c.) ²	-	-	-	-	-	-	-	-	+	+	+	+
Professional service.....	-	-	-	-	-	-	-	-	+	+	+	+
Domestic and personal service.....	-	-	-	-	-	-	-	-	+	+	+	+
Clerical occupations.....	+	+	+	+	+	+	+	+	+	+	+	+

¹ + = excess; - = dearth.

² N. e. c. = not elsewhere classified.

With respect to the middle-aged group all regions showed a dearth of workers in both years in transportation and communication, and the clerical occupations, and in 1920 only in the occupations connected with trade; in 1930 trade showed excesses in all regions. The passage of 10 years effected a decrease of one in the number of subnormal ratios associated with each region.

With respect to the old-aged group the situation in 1930 appears to be very little different from that indicated in 1920, the only difference being that connected with public service: In 1920 all of the regions with the exception of the Northeastern showed dearths of workers in public service; 10 years later all regions showed excesses in this occupational group. The old-aged group shows more occupational groups that are consistently subnormal in the different regions than the middle-aged group. In 1930 the ratio of such occupational groups among the old-aged to those among the middle-aged was 4 to 2; in 1920, 4 to 3. The four occupational groups showing a subnormal number of workers in the old-aged group were the same in both years for that age group, and are transportation and communication, trade, professional service, and clerical occupations.

SUMMARY

This paper, the third of a series, investigates the age of gainful female workers in different geographic regions of the United States for the census years 1920 and 1930. The regions include a Northeastern, a Southern, a North Central, and a Western. The percentage age distribution for each occupational group for a particular region and census year is compared with the percentage age distribution of all

gainful female workers specific for region and year by forming the ratio of corresponding percentages. The paper may be briefly summarized as follows:

1. Regional differences with respect to the number of workers in specific occupational groups were found only in certain of the age groups. An ordering of the regions with respect to any specific occupational group is, therefore, not possible.
2. The trends of the ratios for 1920 are, with some exceptions, similar to those for 1930.
3. As indicated in the previous paper dealing with males and in the introduction to the present paper, the nine occupational groups, generally regardless of region, were classifiable into four categories, depending upon the particular age groups associated with excesses or dearths of workers. Interregional and intercensal dissimilarities in the present instance preclude such classification. The trend of the ratios of the professional service group, however, describes an inverted U in both years, with dearths in the early and late ages and excesses intervening, the dearths in the older ages being particularly noteworthy when compared with the previously reported excesses shown by the corresponding ratios for the males.

REFERENCES

- (1) Gafafer, W. M.: (1937) Age of gainful workers of the United States, 1920 and 1930. Studies on the age of gainful workers no. 1. Pub. Health Rep., 52: 269-281.
- (2) ———: (1937) Age of gainful male workers in different geographic regions of the United States, 1920 and 1930. Studies on the age of gainful workers no. 2. Ibid., 52: 437-453.
- (3) U. S. Department of Commerce, Bureau of the Census: (1933) Fifteenth Census of the United States, 1930. Population, v. 5, General Report on Occupations. Government Printing Office, Washington, D. C. P. 114.

PLAGUE INFECTION FOUND IN FLEAS AND LICE TAKEN FROM GROUND SQUIRRELS IN WASHINGTON STATE

According to a report dated May 15, 1937, from Senior Surgeon C. R. Eskey, plague infection has been proved, by animal inoculation and cultural reactions, in fleas and lice taken from ground squirrels in Washington as follows:

An inoculation of 33 fleas and 3 lice collected by the Washington field unit, April 29, 1937, from 21 *Citellus townsendi* shot on secs. 5 and 33, Tps. 17 and 18 N., R. 34 E., in Adams County, Wash.

An inoculation of 18 fleas and 5 lice obtained by the Washington field unit, April 29, 1937, from 13 *Citellus townsendi* on secs. 8 and 9, T. 17 N., R. 34 E., Adams County, Wash.

It is believed that this is the first positive evidence that plague exists among wild rodents in the State of Washington, and that the

locality in which the infected fleas and lice were collected is the most northern point in the United States in which wild-rodent plague has been found.

DEATHS DURING WEEK ENDED MAY 15, 1937

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

	Week ended May 15, 1937	Correspond- ing week, 1936
Data from 86 large cities in the United States:		
Total deaths.....	8,441	8,511
Average for 3 prior years.....	8,711	
Total deaths, first 19 weeks of year.....	186,226	182,654
Deaths under 1 year of age.....	491	586
Average for 3 prior years.....	613	
Deaths under 1 year of age, first 19 weeks of year.....	11,439	11,211
Data from industrial insurance companies:		
Policies in force.....	69,645,048	68,269,107
Number of death claims.....	13,447	12,212
Death claims per 1,000 policies in force, annual rate.....	10.1	10.1
Death claims per 1,000 policies, first 19 weeks of year, annual rate.....	11.2	11.0

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 22, 1937, and May 23, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936
New England States:								
Maine.....		4		6	21	352	0	0
New Hampshire.....					34	69	0	0
Vermont.....	1				1	354	0	0
Massachusetts.....	6	6			716	1,448	9	4
Rhode Island.....	1	2			150	70	1	1
Connecticut.....	2	3	3		189	219	0	3
Middle Atlantic States:								
New York.....	28	35	17	11	1,693	3,212	10	19
New Jersey.....	16	5	7	3	1,800	588	0	4
Pennsylvania.....	22	42			1,728	1,287	8	15
East North Central States:								
Ohio.....	12	9	24	19	586	435	6	9
Indiana.....	10	13	12	29	653	10	2	5
Illinois.....	37	35	38	62	346	29	4	9
Michigan.....	18	9		2	168	104	0	5
Wisconsin.....	1	8	57	24	63	222	1	0
West North Central States:								
Minnesota.....	2	1	1	2	13	412	2	2
Iowa.....	6	2		1	3	8	0	1
Missouri.....	10	16	36	50	48	20	1	2
North Dakota.....			3		2	2	2	0
South Dakota.....		1			5		0	0
Nebraska.....			1		10	22	3	0
Kansas.....	7	2	2	4	22	10	1	1
South Atlantic States:								
Delaware.....					24	11	0	0
Maryland.....	6		2	5	408	216	1	7
District of Columbia.....	29	19		1	107	161	2	4
Virginia.....	6	10		33	502	111	5	9
West Virginia.....	4	5	20	30	78	93	4	6
North Carolina.....	16	9	3	4	272	19	2	6
South Carolina.....	1	3	69	104		62	0	1
Georgia.....	3	6				8	1	3
Florida.....	5	4	3	4		19	1	0
East South Central States:								
Kentucky.....	7	9	8	30	292	37	11	13
Tennessee.....	4	7	42	74	138	35	2	4
Alabama.....	5	11	49	14	28	6	8	1
Mississippi.....	1	4					1	2

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers
for weeks ended May 22, 1937, and May 23, 1936—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936
West South Central States:								
Arkansas.....	2	3	26	43	2	9	0	0
Louisiana.....	10	12	6	44	7	72	1	1
Oklahoma.....	5	4	24	71	86	21	1	1
Texas.....	46	26	298	138	1,003	216	5	3
Mountain States:								
Montana.....		2	21	14	29	4	0	0
Idaho.....	2		15		25	16	0	1
Wyoming.....		1			5	2	0	0
Colorado.....	3	7			20	36	0	0
New Mexico.....		6	1	2	82	43	0	2
Arizona.....			25	30	46	137	1	1
Utah.....				5	52	24	0	0
Pacific States:								
Washington.....	1	3			55	437	1	0
Oregon.....	2	2	17	18	16	238	1	0
California.....	32	27	41	147	281	2,096	4	6
Total.....	370	373	871	1,024	11,809	12,971	102	151
First 20 weeks of year.....	9,628	10,639	269,849	133,966	164,931	203,937	3,213	4,742

Division and State	Polioomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936
New England States:								
Maine.....	0	0	21	8	0	0	1	0
New Hampshire.....	0	0	11	10	0	0	0	0
Vermont.....	1	0	13	1	0	0	0	0
Massachusetts.....	0	5	259	202	0	0	0	1
Rhode Island.....	0	1	58	26	0	0	1	0
Connecticut.....	0	0	149	34	0	0	0	0
Middle Atlantic States:								
New York.....	1	0	774	703	0	0	8	5
New Jersey.....	1	0	181	284	0	0	1	2
Pennsylvania.....	1	3	413	573	0	0	5	10
East North Central States:								
Ohio.....	0	0	209	171	0	0	5	14
Indiana.....	1	0	115	123	19	1	1	1
Illinois.....	1	1	570	512	16	20	5	4
Michigan.....	2	4	790	259	9	0	5	5
Wisconsin.....	0	0	309	416	2	6	0	2
West North Central States:								
Minnesota.....	0	0	137	244	17	10	0	1
Iowa.....	0	0	156	136	20	33	0	7
Missouri.....	0	0	155	194	61	4	3	1
North Dakota.....	0	0	23	130	7	6	1	1
South Dakota.....	0	0	59	71	4	21	0	0
Nebraska.....	0	0	57	77	4	14	0	0
Kansas.....	0	0	210	267	4	38	8	0
South Atlantic States:								
Delaware.....	0	0	3	9	0	0	1	0
Maryland.....	0	0	41	50	0	0	2	2
District of Columbia.....	0	0	14	17	0	0	2	0
Virginia.....	1	0	10	37	0	0	7	4
West Virginia.....	0	0	73	28	2	0	3	9
North Carolina.....	0	1	38	12	0	0	3	4
South Carolina.....	0	0	1	2	0	0	3	1
Georgia.....	0	0	14	8	0	0	5	7
Florida.....	0	0	4	4	0	0	7	5
East South Central States:								
Kentucky.....	0	1	51	22	1	0	5	5
Tennessee.....	1	2	11	13	0	0	7	4
Alabama.....	0	0	5	3	0	0	6	0
Mississippi.....	2	0	4	4	0	0	2	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 22, 1937, and May 23, 1936—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936	Week ended May 22, 1937	Week ended May 23, 1936
West South Central States:								
Arkansas.....	0	0	11	5	1	0	1	8
Louisiana.....	1	0	11	4	0	0	19	13
Oklahoma.....	0	0	29	34	4	2	4	6
Texas.....	2	0	225	49	16	1	16	7
Mountain States:								
Montana ¹	0	0	17	56	19	12	0	0
Idaho ¹	0	0	21	16	5	6	3	1
Wyoming ¹	0	0	5	25	2	10	0	0
Colorado ¹	0	0	30	83	2	1	0	4
New Mexico.....	0	0	16	75	0	0	0	7
Arizona.....	0	0	10	11	0	0	5	2
Utah ¹	0	0	16	55	0	3	1	0
Pacific States:								
Washington.....	0	0	42	91	7	3	1	4
Oregon ¹	1	0	35	18	7	20	2	0
California.....	2	4	210	266	23	4	2	13
Total.....	18	22	5,616	5,438	252	215	146	156
First 20 weeks of year².....	433	335	134,892	149,796	6,239	4,494	2,265	2,268

¹ New York City only.

² Rocky Mountain spotted fever, week ended May 22, 1937, 15 cases, as follows: South Dakota, 1; Montana, 1; Idaho, 1; Wyoming, 2; Colorado, 3; Oregon, 7.

³ Week ended earlier than Saturday.

⁴ Typhus fever, week ended May 22, 1937, 23 cases, as follows: Georgia, 8; Alabama, 6; Texas, 9.

⁵ Colorado tick fever, week ended May 22, 1937, Wyoming, 2 cases.

⁶ The total for scarlet fever for the first 18 weeks of 1937 (Public Health Reports for May 21, 1937, p. 676) should have been 123,493 instead of 23,493, and for the first 19 weeks (Public Health Reports for May 28, p. 701), 129,276 instead of 29,276.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Menin- gococ- cus menin- gitis	Diph- theria	Influen- za	Mala- ria	Meas- les	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
<i>April 1937</i>										
Alabama.....	60	34	1,838	102	64	10	2	41	1	6
Georgia.....	9	30	1,231	476	15	40	1	41	0	13
Idaho.....	6	5	58	-----	132	-----	1	86	14	2
Illinois.....	24	160	274	10	765	-----	3	3,371	203	10
Kansas.....	4	15	44	2	162	-----	1	1,428	90	5
Maine.....	1	3	15	-----	51	-----	1	88	0	3
Maryland.....	17	42	46	1	2,947	1	0	211	0	6
Michigan.....	8	61	12	4	524	-----	5	3,279	64	12
Minnesota.....	2	49	3	-----	127	-----	2	761	57	1
Mississippi.....	4	20	5,648	2,659	1,744	314	4	28	1	7
Nevada.....	-----	-----	7	-----	31	-----	0	46	0	0
New York.....	45	160	-----	4	4,800	-----	2	4,268	1	24
Oklahoma ¹	18	33	427	26	304	12	6	131	11	16
Rhode Island.....	3	-----	-----	-----	997	-----	0	249	0	5
South Dakota.....	1	3	4	1	14	-----	0	414	18	2
Washington.....	7	4	26	-----	211	-----	2	128	41	4

¹ Exclusive of Oklahoma City and Tulsa.

Summary of monthly reports from States—Continued

April 1937		April 1937—Continued		April 1937—Continued	
	Cases		Cases		Cases
Actinomycosis:		German measles—Cont.		Tetanus:	
Illinois.....	2	Rhode Island.....	31	Alabama.....	5
Botulism:		Washington.....	16	Illinois.....	2
Kansas.....	1	Hookworm disease:		Kansas.....	1
Chicken pox:		Georgia.....	1,082	Maryland.....	2
Alabama.....	108	Mississippi.....	332	Michigan.....	1
Georgia.....	246	Impetigo contagiosa:		New York.....	8
Idaho.....	113	Kansas.....	1	Trachoma:	
Illinois.....	1,965	Maryland.....	6	Idaho.....	1
Kansas.....	413	Oklahoma ¹	1	Illinois.....	153
Maine.....	244	Jaundice, acute infectious:		Kansas.....	2
Maryland.....	718	Michigan.....	2	Maryland.....	1
Michigan.....	1,866	Mumps:		Minnesota.....	3
Minnesota.....	626	Alabama.....	284	Mississippi.....	23
Mississippi.....	794	Georgia.....	321	Oklahoma ¹	1
Nevada.....	5	Idaho.....	93	South Dakota.....	1
New York.....	4,129	Illinois.....	1,089	Trichinosis:	
Oklahoma ¹	65	Kansas.....	1,124	Michigan.....	13
Rhode Island.....	153	Maine.....	286	New York.....	12
South Dakota.....	26	Maryland.....	1,084	Tularaemia:	
Washington.....	861	Michigan.....	2,436	Alabama.....	1
Conjunctivitis:		Mississippi.....	1,272	Georgia.....	11
Georgia.....	3	Oklahoma ¹	22	Illinois.....	2
Idaho.....	6	Rhode Island.....	25	Michigan.....	1
Illinois.....	2	South Dakota.....	7	Typhus fever:	
Oklahoma ¹	1	Washington.....	618	Alabama.....	20
Dengue:		Ophthalmia neonatorum:		Georgia.....	50
Alabama.....	1	Alabama.....	1	New York.....	3
Mississippi.....	5	Illinois.....	2	Undulant fever:	
Diarrhea:		Mississippi.....	3	Alabama.....	1
Maryland.....	3	New York ²	13	Georgia.....	7
Dysentery:		Paratyphoid fever:		Illinois.....	6
Alabama (amoebic).....	3	Georgia.....	2	Kansas.....	2
Georgia (amoebic).....	20	Illinois.....	20	Maine.....	4
Georgia (bacillary).....	21	Michigan.....	3	Maryland.....	1
Illinois (amoebic).....	3	Minnesota.....	1	Michigan.....	8
Illinois (amoebic carriers).....	13	New York.....	1	Minnesota.....	9
Illinois (bacillary).....	32	Washington.....	1	Mississippi.....	1
Maryland (bacillary).....	4	Puerperal septicemia:		Nevada.....	4
Michigan (amoebic).....	3	Mississippi.....	26	New York.....	18
Minnesota (amoebic).....	3	Rabies in animals:		Oklahoma ¹	25
Minnesota (bacillary).....	1	Alabama.....	98	Washington.....	5
Mississippi (amoebic).....	76	Illinois.....	49	Vincent's infection:	
Mississippi (bacillary).....	399	Maine.....	3	Idaho.....	19
New York (amoebic).....	3	Michigan.....	8	Illinois.....	25
New York (bacillary).....	42	Mississippi.....	19	Maine.....	8
Oklahoma (amoebic) ¹	5	New York ²	5	Maryland.....	15
Oklahoma (unspecified) ¹	1	Washington.....	26	Michigan.....	20
Washington (amoebic).....	1	Rocky Mountain spotted fever:		New York ²	63
Encephalitis, epidemic or lethargic:		Idaho.....	4	Oklahoma ¹	4
Alabama.....	3	Scabies:		Washington.....	4
Idaho.....	1	Kansas.....	1	Whooping cough:	
Illinois.....	7	Maryland.....	1	Alabama.....	205
Kansas.....	2	Oklahoma ¹	5	Georgia.....	80
Maryland.....	1	Septic sore throat:		Idaho.....	63
New York.....	17	Georgia.....	39	Illinois.....	803
Oklahoma ¹	1	Idaho.....	2	Kansas.....	291
Washington.....	3	Illinois.....	7	Maine.....	237
German measles:		Kansas.....	5	Maryland.....	476
Alabama.....	3	Maine.....	1	Michigan.....	1,223
Idaho.....	2	Maryland.....	25	Minnesota.....	957
Illinois.....	72	Michigan.....	36	Mississippi.....	689
Kansas.....	12	Minnesota.....	12	Nevada.....	9
Maine.....	39	New York.....	125	New York.....	1,705
Maryland.....	70	Oklahoma ¹	25	Oklahoma ¹	37
Michigan.....	1,174	Rhode Island.....	4	Rhode Island.....	167
New York.....	269	South Dakota.....	3	South Dakota.....	9
		Washington.....	1	Washington.....	300

¹ Exclusive of Oklahoma City and Tulsa.² Exclusive of New York City.

PLAGUE INFECTION FOUND IN FLEAS AND LICE IN STATE OF WASHINGTON

For report of plague infection found in fleas and lice taken from ground squirrels in Adams County, Wash., see page 748.

CASES OF VENEREAL DISEASES REPORTED FOR MARCH 1937

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama.....	793	2.80	104	0.37
Arizona ¹				
Arkansas ²	521	2.61	291	1.46
California.....	2,362	4.19	1,931	3.42
Colorado ¹				
Connecticut.....	239	1.39	98	.57
Delaware.....	184	7.19	35	1.37
District of Columbia.....	196	3.30	177	2.98
Florida ¹	63	.89	26	.16
Georgia.....	1,447	4.33	565	1.69
Idaho.....	70	1.46	65	1.36
Illinois.....	2,244	2.87	1,321	1.69
Indiana.....	167	.46	126	.37
Iowa ¹	262	1.03	197	.78
Kansas.....	182	.82	86	.19
Kentucky.....	255	.90	97	.34
Louisiana.....	210	.99	113	.53
Maine.....	71	.84	58	.69
Maryland.....	733	4.39	253	1.52
Massachusetts.....	637	1.46	462	1.06
Michigan.....	752	1.61	545	1.17
Minnesota.....	267	1.02	279	1.06
Mississippi.....	2,184	11.14	2,354	12.00
Missouri.....	332	.98	231	.59
Montana ¹	22	.41	23	.43
Nebraska.....	77	.56	78	.57
Nevada ¹				
New Hampshire.....	30	.60	19	.38
New Jersey.....	745	1.74	226	.53
New Mexico.....	143	3.56	45	1.12
New York.....	9,255	7.18	2,072	1.61
North Carolina.....	2,459	7.20	485	1.42
North Dakota.....	31	.44	44	.63
Ohio.....	1,242	1.83	330	.49
Oklahoma ¹	264	1.05	262	1.04
Oregon.....	64	.63	116	1.15
Pennsylvania ¹	1,008	1.00	149	.15
Rhode Island.....	90	1.32	52	.76
South Carolina ¹	418	2.08	857	1.92
South Dakota.....	102	1.51	34	.50
Tennessee.....	682	2.35	242	.83
Texas.....	310	.51	335	.63
Utah ¹				
Vermont.....	15	.40	21	.56
Virginia.....	630	2.40	221	.84
Washington.....	262	1.60	360	2.20
West Virginia.....	336	1.85	113	.62
Wisconsin ¹	36	.12	138	.47
Wyoming ¹				
Total.....	32,402	2.59	15,166	1.21

See footnotes at end of table.

Reports from cities of 200,000 population or over

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Akron, Ohio.....	56	2.06	14	.52
Atlanta, Ga.....	171	5.96	165	5.75
Baltimore, Md.....	368	4.46	144	1.75
Birmingham, Ala.....	184	6.52	116	4.11
Boston, Mass.....	257	3.25	168	2.12
Buffalo, N. Y.....	316	5.34	105	1.77
Chicago, Ill.....	1,417	3.97	857	2.40
Cincinnati, Ohio ¹				
Cleveland, Ohio.....	234	2.52	102	1.10
Columbus, Ohio.....	71	2.32	34	1.11
Dallas, Tex.....	291	1.00	68	2.35
Dayton, Ohio ¹				
Denver, Colo.....	105	3.54	53	1.79
Detroit, Mich.....	394	2.28	237	1.87
Houston, Tex. ²	138	4.12	33	.99
Indianapolis, Ind.....	30	.80	38	1.00
Jersey City, N. J. ¹				
Kansas City, Mo.....	58	1.38	6	.14
Los Angeles, Calif.....	579	4.04	414	2.89
Louisville, Ky.....	137	4.23	61	1.57
Memphis, Tenn.....	275	10.30	72	2.70
Milwaukee, Wis. ¹				
Minneapolis, Minn.....	85	1.75	92	1.89
Newark, N. J.....	252	5.44	181	8.91
New Orleans, La.....				
New York, N. Y.....	7,616	10.43	1,446	1.98
Oakland, Calif.....	40	1.32	36	1.19
Omaha, Nebr.....	13	.59	7	.32
Philadelphia, Pa. ¹				
Pittsburgh, Pa.....	90	1.32	23	.84
Portland, Oreg. ¹				
Providence, R. I.....	45	1.74	24	.93
Rochester, N. Y.....	59	1.75	48	1.42
St. Louis, Mo.....	181	2.17	139	1.66
St. Paul, Minn.....	23	1.17	42	1.49
San Antonio, Tex.....	9	.36	5	.20
San Francisco, Calif.....	129	1.92	144	2.15
Seattle, Wash.....	135	3.56	173	4.56
Syracuse, N. Y.....	101	4.63	50	2.29
Toledo, Ohio.....	90	2.96	43	1.58
Washington, D. C. ¹	196	3.30	177	2.98

¹ No report for current month.² Incomplete.³ Not reporting.⁴ Includes only those cases that enter the clinics conducted by the State department of health.⁵ Only cases of syphilis in the infectious stage are reported.⁶ Reported by the Jefferson Davis Hospital; physicians are not required to report venereal disease.⁷ Reported by the Social-Hygiene clinic.

ANNUAL CASE RATES¹ FOR VENEREAL DISEASES, CALENDAR YEAR 1936

Reports from States

	Annual rates per 1,000 population			Annual rates per 1,000 population	
	Syphilis	Gonor- rhea		Syphilis	Gonor- rhea
Alabama.....	3.96	1.36	Nevada ²		
Arizona.....	1.12	2.73	New Hampshire.....		.38
Arkansas.....	1.13	.68	New Jersey.....	1.61	.74
California.....	2.77	2.71	New Mexico.....	1.85	1.22
Colorado.....	.37	.41	New York.....	6.83	1.73
Connecticut.....	1.46	.89	North Carolina.....	5.09	1.64
Delaware.....	5.78	2.08	North Dakota.....	.31	.95
District of Columbia.....	3.38	3.34	Ohio.....	1.26	.54
Florida.....	2.04	.71	Oklahoma.....	.92	.74
Georgia.....	4.19	1.97	Oregon.....	.74	1.58
Idaho.....	.61	.59	Pennsylvania.....	.39	.20
Illinois.....	2.14	1.66	Rhode Island.....	1.96	1.07
Indiana.....	.45	.41	South Carolina.....	1.38	1.73
Iowa.....	.51	.70	South Dakota.....	.25	.50
Kansas.....	.53	.42	Tennessee.....	3.15	1.63
Kentucky.....	.94	1.01	Texas.....	.93	.38
Louisiana.....	1.30	.66	Utah ²		
Maine.....	.52	.67	Vermont.....	.20	.92
Maryland.....	5.76	1.72	Virginia.....	2.52	1.21
Massachusetts.....	1.26	1.39	Washington.....	1.20	1.84
Michigan.....	1.38	1.40	West Virginia.....	1.34	.74
Minnesota.....	1.29	1.32	Wisconsin.....	.10	.57
Mississippi.....	8.46	12.30	Wyoming ²		
Missouri.....	1.24	.70	Total.....	2.26	1.31
Montana.....	.92	1.21			
Nebraska.....	.29	.61			

Reports from cities of 200,000 population or over

Akron, Ohio.....	0.93	0.46	Milwaukee, Wis.....	0.10	0.33
Atlanta, Ga.....	6.22	6.23	Minneapolis, Minn.....	1.81	2.52
Baltimore, Md.....	6.78	1.99	Newark, N. J.....	5.87	2.70
Birmingham, Ala.....	5.58	2.87	New Orleans, La.....	2.01	1.45
Boston, Mass.....	3.25	3.41	New York, N. Y.....	9.44	1.98
Buffalo, N. Y.....	3.89	1.77	Oakland, Calif.....	1.52	1.60
Chicago, Ill.....	2.61	2.27	Omaha, Nebr.....	.56	.67
Cincinnati, Ohio.....	1.68	1.22	Philadelphia, Pa.....	1.54	.36
Cleveland, Ohio.....	2.49	1.15	Pittsburgh, Pa.....	1.07	.44
Columbus, Ohio.....	1.83	.81	Portland, Oreg.....	1.53	2.75
Dallas, Tex.....	3.60	1.73	Providence, R. I.....	2.84	1.66
Dayton, Ohio.....	2.54	1.04	Rochester, N. Y.....	1.72	1.76
Denver, Colo.....	1.35	1.20	St. Louis, Mo.....	3.37	1.79
Detroit, Mich.....	1.42	1.86	St. Paul, Minn.....	1.34	1.82
Houston, Tex.....	7.43	2.19	San Antonio, Tex. ³		
Indianapolis, Ind.....	.89	1.16	San Francisco, Calif.....	2.47	2.52
Jersey City, N. J.....	.06	.06	Seattle, Wash.....	3.16	4.53
Kansas City, Mo.....	1.60	.20	Syracuse, N. Y.....	4.79	2.37
Los Angeles, Calif.....	3.42	2.98	Toledo, Ohio.....	1.85	1.15
Louisville, Ky.....	9.64	4.91	Washington, D. C.....	3.38	3.34
Memphis, Tenn.....	8.54	2.88			

¹ Based on monthly reports.² Not reporting.³ Reported for only 1 month.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 15, 1937

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

State and city	Diph- theria cases	Influenza		Meas- les cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average.....	200	154	50	7,328	673	2,357	19	432	31	1,472	-----
Current week.....	153	68	37	4,592	611	2,537	26	392	24	1,398	-----
Maine:											
Portland.....	0	-----	0	0	2	1	0	0	0	5	26
New Hampshire:											
Concord.....	0	-----	0	1	1	0	0	0	0	0	17
Nashua.....	0	-----	0	0	1	0	0	0	0	0	9
Vermont:											
Barre.....	1	-----	0	0	0	2	0	0	0	2	1
Burlington.....	0	-----	0	0	0	0	0	0	0	0	7
Rutland.....	0	-----	0	1	2	0	0	1	0	2	8
Massachusetts:											
Boston.....	0	-----	0	44	24	59	0	11	0	45	235
Fall River.....	0	-----	0	57	1	4	0	0	0	3	26
Springfield.....	0	-----	0	0	4	10	0	1	0	7	37
Worcester.....	0	-----	0	25	6	5	0	0	0	20	50
Rhode Island:											
Pawtucket.....	0	-----	0	5	0	1	0	0	0	0	10
Providence.....	0	-----	0	154	7	32	0	1	0	7	57
Connecticut:											
Bridgeport.....	0	-----	0	1	3	79	0	0	0	0	29
Hartford.....	1	-----	0	16	2	3	0	0	0	2	41
New Haven.....	0	-----	0	8	1	10	0	0	0	1	42
New York:											
Buffalo.....	0	-----	1	99	20	24	0	7	0	32	166
New York.....	37	7	4	952	110	418	0	89	3	61	1,488
Rochester.....	0	1	0	12	2	3	0	1	0	7	48
Syracuse.....	0	-----	0	40	6	22	0	0	0	22	41
New Jersey:											
Camden.....	2	-----	0	2	1	4	0	0	0	5	83
Newark.....	0	1	0	166	11	17	0	5	0	15	113
Trenton.....	0	-----	0	3	2	9	0	1	0	6	88
Pennsylvania:											
Philadelphia.....	5	6	4	31	34	292	0	31	1	51	514
Pittsburgh.....	0	2	2	160	19	59	0	8	0	23	193
Reading.....	1	-----	1	403	2	14	0	1	0	4	28
Scranton.....	0	-----	-----	0	-----	19	0	-----	0	2	-----
Ohio:											
Cincinnati.....	1	2	1	206	9	19	0	8	0	17	130
Cleveland.....	1	8	2	393	21	135	0	7	0	42	189
Columbus.....	1	-----	0	24	2	14	0	4	1	33	76
Toledo.....	0	-----	0	369	3	4	0	4	0	47	77
Indiana:											
Anderson.....	0	-----	0	10	0	10	0	0	0	3	7
Fort Wayne.....	0	-----	0	1	1	4	0	2	0	6	23
Indianapolis.....	6	-----	0	477	9	36	0	3	1	63	115
Muncie.....	0	-----	0	0	1	0	0	1	0	4	20
South Bend.....	0	-----	0	4	0	4	0	0	0	8	17
Terre Haute.....	1	-----	0	0	0	0	4	0	0	1	21
Illinois:											
Alton.....	0	-----	0	0	1	6	0	0	0	1	14
Chicago.....	21	3	1	104	30	283	0	47	0	74	665
Elgin.....	0	-----	0	0	0	0	0	0	0	4	9
Moline.....	0	-----	0	0	2	7	0	0	0	2	11
Springfield.....	0	-----	0	3	0	7	0	0	0	7	17
Michigan:											
Detroit.....	5	-----	2	27	21	352	4	16	2	42	295
Flint.....	0	-----	0	55	6	20	0	1	0	3	35
Grand Rapids.....	0	-----	0	74	2	17	0	1	0	31	35
Wisconsin:											
Kenosha.....	0	-----	0	1	0	5	0	0	0	2	10
Madison.....	0	-----	0	0	0	3	0	0	0	4	16
Milwaukee.....	1	2	2	10	9	65	0	8	0	16	128
Racine.....	0	-----	0	1	1	9	0	0	0	1	16
Superior.....	0	-----	0	0	0	9	0	0	0	0	8
Minnesota:											
Duluth.....	0	-----	0	0	0	27	0	2	0	7	32
Minneapolis.....	2	-----	1	2	3	21	0	1	0	34	98
St. Paul.....	0	1	1	1	3	14	0	1	0	79	56

City reports for week ended May 15, 1937—Continued

State and city	Diph- theria cases	Influenza		Meas- les cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Iowa:											
Cedar Rapids.....	0			2		5	0		0	0	
Davenport.....	0			0		5	1		0	1	
Des Moines.....	0			0		27	1		0	0	27
Sioux City.....	0			0		9	0		0	2	
Waterloo.....	2			0		15	0		0	2	
Missouri:											
Kansas City.....	2		0	2	9	75	0	4	0	12	85
St. Joseph.....	0		0	0	3	4	3	0	0	1	12
St. Louis.....	14		1	19	1	169	0	5	1	84	205
North Dakota:											
Fargo.....	0			1		0			0	2	
Grand Forks.....	0			0		0	1		0	0	
Minot.....	0			0		0	0		0	0	3
South Dakota:											
Aberdeen.....	0			0		3	0		0	0	
Sioux Falls.....	0		0	0	0	0	0		0	0	5
Nebraska:											
Omaha.....	0		1	0	3	4	1	0	0	9	40
Kansas:											
Lawrence.....	0		0	0	1	1	0	0	0	0	8
Topeka.....	1		1	0	2	7	1	0	0	7	23
Wichita.....	0		0	15	5	4	0	0	0	15	24
Delaware:											
Wilmington.....	0		0	3	5	1	0	1	0	2	33
Maryland:											
Baltimore.....	2	2	2	290	18	13	0	12	0	73	212
Cumberland.....	0		0	0	3	0	0	1	0	2	14
Frederick.....	0		0	0	0	0	0	0	0	0	7
Dist. of Col.:											
Washington.....	3		0	104	14	10	0	10	0	11	157
Virginia:											
Lynchburg.....	0		0	3	1	0	0	2	0	6	19
Richmond.....	0		1	1	4	2	0	1	0	3	45
Roanoke.....	0		0	121	0	1	0	0	0	2	15
West Virginia:											
Charleston.....	0	1	0	0	4	2	0	0	0	0	23
Huntington.....	0			0		11	0		0	0	
Wheeling.....	0		0	0	1	4	0	1	0	10	21
North Carolina:											
Gastonia.....	1	0	0	1	0	0	0	0	0	0	
Raleigh.....	0		0	1	1	6	0	1	0	0	8
Wilmington.....	0		0	0	1	0	0	3	0	3	12
Winston-Salem.....	0		0	0	0	2	0	2	0	1	11
South Carolina:											
Charleston.....	0	5	0	0	4	0	0	1	1	2	17
Columbia.....	0		0	0	3	0	0	1	0	0	24
Florence.....	0		0	0	3	0	0	0	0	0	10
Greenville.....	0		0	1	1	0	0	1	1	10	9
Georgia:											
Atlanta.....	0	4	0	0	9	2	0	4	0	10	82
Brunswick.....	0		0	0	1	0	0	0	0	3	4
Savannah.....	0	12	0	0	0	1	0	0	0	4	30
Florida:											
Miami.....	1	7	0	0	2	1	0	4	0	4	24
Tampa.....	1	1	1	15	3	0	0	1	0	3	21
Kentucky:											
Ashland.....	0		0	35	3	0	0	0	2	0	7
Covington.....	0		0	42	1	1	0	0	0	5	15
Lexington.....	0		0	5	3	0	0	3	0	21	22
Louisville.....	0	2	0	47	11	14	0	2	0	32	79
Tennessee:											
Knoxville.....	0	1	1	0	3	0	0	2	0	0	32
Memphis.....	0		1	79	4	1	0	2	2	45	71
Nashville.....	0		0	15	4	7	0	5	0	4	46
Alabama:											
Birmingham.....	3		2	6	10	2	0	6	1	7	76
Mobile.....	1		0	0	2	4	0	2	0	0	24
Montgomery.....	0	1		1		0	0		0	0	
Arkansas:											
Fort Smith.....	0			2		0	0		0	1	
Little Rock.....	0		0	0	6	4	0	1	0	0	7
Louisiana:											
Lake Charles.....	1		0	0	2	0	0	0	0	0	9
New Orleans.....	8	2	0	9	17	18	0	9	2	2	142
Shreveport.....	2		0	0	12	0	0	2	3	5	44

City reports for week ended May 15, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Oklahoma:											
Muskogee.....	0			0		1	0		0	0	
Oklahoma City.....	1	4	0	0	10	8	0	2	0	0	37
Tulsa.....	0			7		5	0		0	8	
Texas:											
Dallas.....	1		0	185	5	5	0	1	0	21	64
Fort Worth.....	0		0	9	0	9	0	2	1	9	35
Galveston.....	0		0	0	3	0	0	0	0	0	16
Houston.....	6		1	0	7	1	0	8	0	3	77
San Antonio.....	1		1	6	9	1	0	5	0	3	82
Montana:											
Billings.....	0		0	0	0	0	0	0	0	3	11
Great Falls.....	0		0	0	0	1	0	0	0	3	5
Helena.....	0		0	0	0	3	0	0	0	0	3
Missoula.....	0		0	0	1	0	1	0	0	0	9
Idaho:											
Boise.....	0		0	0	1	1	0	0	0	1	6
Colorado:											
Colorado Springs.....	0		0	0	0	3	0	2	0	0	14
Denver.....	4		0	19	7	15	3	6	2	36	99
Pueblo.....	0		0	1	2	0	0	1	0	3	13
New Mexico:											
Albuquerque.....	0		0	0	1	5	0	0	0	1	11
Utah:											
Salt Lake City.....	0		1	31	2	3	0	1	0	23	29
Washington:											
Seattle.....	1		1	4	6	2	0	4	1	33	98
Spokane.....	0		0	28	1	4	2	3	0	14	25
Tacoma.....	0		0	0	0	1	1	1	0	4	31
Oregon:											
Portland.....	0	1	0	2	8	20	2	1	0	1	74
Salem.....	0			0		2	0		0	0	
California:											
Los Angeles.....	15	6	1	36	26	37	6	18	1	88	327
Sacramento.....	0		0	38	4	4	0	0	1	12	26
San Francisco.....	2	1	0	3	15	16	0	11	1	39	189

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Virginia:			
Boston.....	3	0	0	Richmond.....	1	1	0
Springfield.....	1	0	0	West Virginia:			
Rhode Island:				Huntington.....	1	0	0
Providence.....	2	0	0	Wheeling.....	2	1	0
New York:				Georgia:			
Buffalo.....	1	0	0	Atlanta.....	1	1	0
New York.....	5	0	0	Florida:			
Pennsylvania:				Miami.....	0	1	0
Philadelphia.....	4	2	0	Kentucky:			
Pittsburgh.....	0	2	0	Louisville.....	1	0	0
Ohio:				Alabama:			
Cincinnati.....	1	2	0	Birmingham.....	1	0	0
Cleveland.....	1	0	0	Louisiana:			
Indiana:				Shreveport.....	0	0	1
Anderson.....	1	0	0	Oklahoma:			
Indianapolis.....	2	0	1	Muskogee.....	1	0	0
Illinois:				Tulsa.....	1	0	0
Chicago.....	1	2	1	Texas:			
Minnesota:				Galveston.....	1	0	0
Minneapolis.....	2	0	0	Houston.....	0	1	0
Missouri:				San Antonio.....	0	0	1
St. Joseph.....	0	1	0	Colorado:			
St. Louis.....	2	2	0	Denver.....	1	1	0
Maryland:				Utah:			
Baltimore.....	1	2	0	Salt Lake City.....	1	0	0
District of Columbia:				California:			
Washington.....	2	0	0	Los Angeles.....	0	1	0

Encephalitis, epidemic or lethargic.—Cases: New York, 3; Spokane, 1.

Pellagra.—Cases: Charleston, S. C., 4; Brunswick, 1; Savannah, 10; Miami, 1; Montgomery, 1; Los Angeles, 2.

FOREIGN AND INSULAR

CANADA

Correction.—A report appearing on page 681 of the Public Health Reports for May 21, 1937, shows 39 cases of diphtheria in the Province of New Brunswick during the 2 weeks ended April 24, 1937. This is an error. The report should have read 39 cases of chicken pox, which will make the total for chicken pox 1,132 cases and that for diphtheria 62 cases.

CUBA

Habana—Communicable diseases—4 weeks ended May 8, 1937.—During the 4 weeks ended May 8, 1937, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria.....	25	2	Scarlet fever.....	1	-----
Leprosy.....	1	-----	Tuberculosis.....	16	1
Malaria.....	142	2	Typhoid fever.....	147	7
Poliomyelitis.....	1	-----			

¹ Includes imported cases.

JAMAICA

Communicable diseases—4 weeks ended May 15, 1937.—During the 4 weeks ended May 15, 1937, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox.....	9	19	Puerperal fever.....	1	1
Diphtheria.....	2	-----	Scarlet fever.....	-----	1
Dysentery.....	6	4	Tuberculosis.....	84	85
Erysipelas.....	1	2	Typhoid fever.....	9	67

YUGOSLAVIA

Communicable diseases—4 weeks ended April 25, 1937.—During the 4 weeks ended April 25, 1937, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax.....	14	-----	Poliomyelitis.....	8	2
Cerebrospinal meningitis.....	50	16	Rabies.....	1	1
Diphtheria and croup.....	614	64	Scarlet fever.....	285	5
Dysentery.....	27	1	Sepsis.....	13	1
Erysipelas.....	235	8	Tetanus.....	27	9
Lethargic encephalitis.....	2	-----	Typhoid fever.....	120	14
Measles.....	696	11	Typhus fever.....	93	4
Paratyphoid fever.....	10	-----			

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

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the **PUBLIC HEALTH REPORTS** for May 28, 1937, pages 709-722. A similar cumulative table will appear in the **PUBLIC HEALTH REPORTS** to be issued June 25, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

India.—During the week ended May 15, 1937, 1 fatal case of cholera was reported in Sind State, India.

Plague

China.—The Weekly Epidemiological Record for May 13, 1937, published by the League of Nations, states that according to a report dated May 10, several hundred deaths from bubonic plague, of which 70 percent were in children, have been reported at Hsiatangchi (Siatangtsi) in the central district of the province of Anhwei, 100 miles west of Nanking. During the months of March and April 1937 an epidemic of plague, with more than 200 deaths, was reported in the province of Fukien, at Weian (Hweian).

United States—Washington.—A report of plague infection in fleas and lice taken from ground squirrels in Adams County, Wash., appears on page 748 of this issue of **PUBLIC HEALTH REPORTS**.

Smallpox

Mexico—Correction.—The report of smallpox during the month of January 1937 in Ciudad Juarez, Chihuahua State, Coahuila State, and Tamaulipas State, published on page 626 of the **PUBLIC HEALTH REPORTS** for May 7, 1937, is an error. Information has been received stating that no smallpox was reported during the month in these localities.

Typhus Fever

Chile.—During the year 1936, 4,011 cases of typhus fever with 762 deaths were reported in Chile, of which 1,028 cases and 189 deaths occurred in Santiago, 298 cases and 45 deaths in Chillan, 279 cases and 51 deaths in Concepcion, and 205 cases and 41 deaths in San Miguel. From December 27, 1936, to March 6, 1937, 685 cases of typhus fever with 131 deaths were reported in Chile. Reports of typhus fever in certain cities for the same period were as follows: Santiago, 198 cases and 31 deaths; Chillan, 71 cases and 11 deaths; San Miguel, 54 cases and 14 deaths; Concepcion, 45 cases and 14 deaths; and Valparaiso, 21 cases and 4 deaths.

Iraq.—During the week ended May 8, 1937, 6 cases of typhus fever were reported in Diwaniyeh Province, Iraq.

Yellow Fever

Brazil.—Yellow fever has been reported in Brazil as follows: Minas Geraes State, Alfenas, April 11, 1 death; Carmo do Rio Claro, March 27, 1 death; Guaxupe, April 9, 1 death; Monte Santo, April 17, 1 death (first appearance); Nepomuceno, April 6, 1 death; Rezende Costa, April 7, 1 death (first appearance); Tres Coracoes, April 10, 1 death (first appearance). Sao Paulo State, Botucatu, March 27, 1 death (first appearance); Cabreuva, March 5–11, 3 deaths (first appearance); Campinas, March 21, 1 death; Capivari, March 17, 1 death (first appearance); Cotia, March 23, 1 death (first appearance), March 30, 1 death; Parnahyba, March 8–24, 9 deaths; Presidente Prudente, March 25, 1 death (first appearance); Presidente Wenceslau, March 12–23, 3 deaths; Regente Feijo, March 15, 1 death (first appearance), March 19, 1 death; Salto, March 17, 1 death (first appearance); Santo Anastacio, March 16, 1 death (first appearance), March 21, 1 death.

Senegal.—One fatal case of yellow fever was reported in Tilmaka, Senegal, on May 18, 1937.