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CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES ¹

May 24—June 20, 1931

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports under the section entitled "Prevalence of Disease."

Measles.—The rather high incidence of measles since the beginning of the current year reached its peak the latter part of April and has declined rapidly in all sections of the country. The number of cases (63,199) reported for the 4-week period ended June 20 was only about 5 per cent in excess of the number reported for the corresponding period last year. In 1929 the number of cases totaled 51,490—approximately 20 per cent less than for the current period.

The greatest number of cases of measles has been continuously reported from the States along the Atlantic coast and in the Great Lakes region. In the South Atlantic group almost four times as many cases were reported during the current period as were recorded last year at that time.

While many cases have been reported from the other sections of the country, in none of them has the number exceeded that of last year. In the West North Central group an average of 45 per cent decrease from last year's figure has been maintained during the five preceding 4-week periods of the year, and in the Mountain and Pacific group an average of 58 per cent decrease.

Poliomyelitis.—Reports from the various geographic regions indicate an increase in the occurrence of poliomyelitis over the preceding 4-week period. Each geographic group contributed to the increase, but the largest number of cases was reported from the North Atlantic and Mountain and Pacific groups. Each of these groups reported 30 of the total of 124 cases. In the former group Massachusetts reported 8 cases and New York 16; in the latter region, California reported 23.

¹ From the Office of Statistical Investigations, U. S. Public Health Service. The number of States included for the various diseases are as follows: Typhoid fever, 47; poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 45; diphtheria, 47; scarlet fever, 47; influenza, 39 States and New York City. The District of Columbia is counted as a State in these reports.

emergency work, the Public Health Service will assist the State health department in providing temporary personnel. Such personnel should not be construed as constituting a county health department. It is temporary personnel supplied through the State health department for the limited period of the emergency, and will be withdrawn when the emergency ends.

3. Aiding in the support of mobile health units—

These units will be considered to be a part of the State Central Administration and will be supported by State funds to the greatest extent possible. They are for use in providing temporary health services in local communities which require such services.

4. By aiding in the support of individual county nurses and sanitary inspectors:

Such personnel may be utilized in counties which require their services and in which organized health departments can not at present be maintained. The salaries will be defrayed as largely as possible from State and local funds. Such personnel should be regarded as State personnel and strictly of a temporary character.

5. By supplementing State boards of health by supervisory personnel required for emergency work (assistant directors of rural health work, assistant directors of child hygiene, assistant sanitary engineers, and the like).

6. By aiding in supplying biologic products:

The Public Health Service will assist when necessary in providing biologic products for use in preventing the spread of communicable diseases. The cost of such products will be defrayed as largely as possible from State and local funds. Arrangements regarding biologic products will be made by the Public Health Service through the State health departments, and not through local authorities.

EXPERIMENTS WITH CERTAIN FUMIGANTS USED FOR THE DESTRUCTION OF COCKROACHES

By J. R. RIDLON, *Surgeon, United States Public Health Service*

The officers of the United States Public Health Service fumigate nearly 4,000 vessels each year in connection with the enforcement of the Federal maritime quarantine regulations. The purpose of these fumigations is the destruction of rats on shipboard in order to prevent the spread of bubonic plague. It is also important, for several reasons, that vermin, including cockroaches, be killed by these fumigations. It is customary for ships' officers and agents to judge the efficiency of fumigation by the success shown in the destruction of cockroaches. While such insects are ordinarily of little or no quarantine importance, evidence is available that they may be of some sanitary importance on account of their contamination of foodstuffs and for other reasons.

Cockroaches are extremely common on many vessels, especially during warm weather and on those vessels running to the warmer climates. These insects particularly frequent the galleys, pantries, and provision storerooms. They are especially likely to be found in warm places. The smaller species are able to squeeze into the narrow cracks and crevices behind woodwork, such as ceilings, moldings,

closets, and in cupboards. It is very difficult to eradicate them by the use of the ordinary sprays and powders found on the market.

The roaches belong to a large family, the Blattidæ. Three species have been noted on vessels at the port of San Francisco; namely, *Blattella germanica*, *Blatta orientalis*, and *Periplaneta americana*.

Blattella germanica is by far the most common species. It is the smallest of the three species; the males measure about 13 millimeters and the females 11 millimeters in length. The females carry the eggs in tough capsules attached to their bodies. These capsules may be deposited before the eggs hatch or the eggs may hatch while the capsule is still attached. It is reported that under favorable conditions the young pass through several molts and attain full growth in about six months. This species is often called the Croton bug.

The *Blatta orientalis* is not uncommon on vessels coming from Mexican and Central American ports. Both the males and females are from 20 to 23 millimeters in length and are dark brown in color. The egg capsule usually contains 16 eggs. It is said that full development may take three to four years.

The *Periplaneta americana* is the largest of the three, measuring 28 to 32 millimeters both in male and female. These are only occasionally seen in vessels from warm climates. The female lays an egg capsule containing about 30 eggs. It is said that the egg pod is always deposited before the eggs hatch.

Fox (1) says:

Roaches are a sanitary menace because they are potential carriers of infection mechanically by means of their feet and bodies. They soil everything they come in contact with, leaving a nauseous roachy odor.

Pryor (2) says:

As cockroaches crawl almost everywhere and grovel in filth, they readily may spread filth and sputum-borne diseases by infecting food and water * * *. Aboard ship they frequently destroy considerable foodstuff, and if permitted to develop in numbers, ruin foods to which they have had access. The disagreeable roachy odor comes from a dark fluid exuded from the mouth and also from the excrement.

Toda (3) fed cockroaches (*B. germanica*) on cholera cultures and recovered viable vibrios from their feces or intestines in 15 per cent of 94 insects examined. He states that the feces may contain viable vibrios for 24 to 48 or even 72 hours after the infective feed. He suggests the possibility that the cockroach might act as a vector of cholera vibrios under conditions prevailing on shipboard.

Barber (4) reports that cockroaches which have fed on human cholera feces may discharge viable vibrios for at least two days after the insects have fed, and in reduced numbers even 79 hours after ingestion. In Barber's opinion cockroaches may convey infection to human food either through infected vomit or feces; and in human

food so infected, vibrios may survive at least 16 hours after discharge from the insect.

Macfie (5) reports feeding experiments on roaches species *Periplaneta americana*, which show that they may transmit many intestinal diseases mechanically. The bacilli of tuberculosis and the bacilli of leprosy as well as cysts of *Entamoeba histolytica*, *Entamoeba coli*, and *Giardia* were passed through roaches unharmed and virulent. The eggs of hookworm, *Ascaris* and *Trichuris* were also passed readily. In experiments with the bacilli of typhoid, paratyphoid, and dysentery, these organisms were not recovered from the feces of roaches.

Morrell (6) conducted experiments with roaches collected from the galley on shipboard. He found them to be naturally infected with *Bacillus lactis aerogenes* and *Bacillus cloacae* and certain molds. When the roaches were fed artificially he was able to recover tubercle bacilli and staphylococci from pus and spores from fungi. He reports that roaches can readily cause contamination of food by tubercle bacilli and other organisms and can cause the souring of milk, and he considers them a domestic pest.

Longfellow (7) incriminates roaches as mechanical carriers of common pathogenic bacteria which they deposit on foodstuffs and considers them as dangerous as the flies.

Rice (8) carefully observed routine ship fumigation by hydrocyanic acid-cyanogen chloride mixture and concluded that "with a ship properly closed and sealed, the cyanogen chloride and hydrocyanic gas developed by 120 gm. (4 ounces) of sodium cyanide to each 1,000 cubic feet, in conjunction with sodium chlorate and hydrochloric acid, will kill practically all Croton bugs in a 2-hour exposure. A 4-hour exposure would be more efficient, as the gas would then reach the roaches that were too well protected by cover to be reached by a shorter exposure. The same gas in the same time will kill the eggs of the Croton bug unless they are too well protected."

Neifert and Garrison (9) conducted careful experiments and found that the roach *Blattella germanica* was killed by a 30-minute exposure to 0.5 per cent concentration of cyanogen chloride gas and that the eggs were devitalized by a 60-minute exposure to 2 per cent concentration of the same gas. The roaches were also killed by a 15-minute exposure to a 0.2 per cent concentration of straight hydrocyanic acid gas.

The experiments here described were conducted at the San Francisco Quarantine Station, Angel Island, Calif., in a tightly sealed room containing approximately 500 cubic feet. The room was not heated, and so conditions were comparable as to temperature with those prevailing on shipboard at this port.

The tests extended from August, 1929, to February, 1930. The room opened off the laboratory, and apertures were arranged so that

roaches or chemicals could be placed in the room without opening the door. There was a glass in the door through which one could observe the effect of the gas upon the roaches. All of the roaches had been captured alive on shipboard. They were kept in wooden cages with screened sides, 6 by 4 by 4 inches, and were subjected to the gases in these containers. The cages contained varying numbers of roaches, from 2 to 200.

The following chemicals were used for fumigation: Hydrocyanic acid gas, generated from sodium cyanide, sulphuric acid, and water; hydrocyanic acid-cyanogen chloride gas mixture, generated from sodium cyanide, sodium chlorate, hydrochloric acid, and water; liquid hydrocyanic acid with 10 per cent chloropicrin; liquid hydrocyanic acid with 20 per cent cyanogen chloride, liquid hydrocyanic acid with 5 per cent chloropicrin, and Zyklon-B with 5 per cent chloropicrin.

After being subjected to fumigation, all roaches were kept in petri dishes at room temperature for two months to see whether any eggs would hatch.

Table 1 shows the result of 332 exposures of 304 lots of *Blattella germanica* to various fumigants. The table shows the amount of chemical used, the time of exposure, the number of roaches in the cage, the number of roaches killed, and the number alive after the exposure. The amount of chemical is recorded in avoirdupois units.

TABLE 1.—Results of exposure of *Blattella germanica* to various fumigants

No.	Chemical	Amount	Time	Number of roaches	Number killed	Number alive	Remarks
1	Zyklon-B.....	15 gm. to 500 cubic feet.	Hours $\frac{3}{4}$	21	19	2	6 females; eggs hatched, several on fourth day.
	do.....	do.....	32 $\frac{1}{2}$	2	2	0	Eggs hatched on second day.
2	do.....	do.....	$\frac{1}{2}$	5	4	1	No females.
3	do.....	do.....	32 $\frac{1}{2}$	50	48	2	3 females.
	do.....	do.....	15 $\frac{1}{2}$	2	1	1	
4	do.....	do.....	$\frac{1}{2}$	20	17	3	2 females.
	do.....	do.....	15 $\frac{1}{2}$	3	1	2	
	do.....	do.....	8 $\frac{1}{2}$	2	1	1	Survived 3 exposures.
5	do.....	do.....	1	12	7	5	3 females; 1 egg hatched.
	do.....	do.....	8 $\frac{1}{2}$	5	0	5	
	do.....	do.....	8	5	0	5	Survived 3 exposures.
6	do.....	do.....	16	10	9	1	3 females.
	do.....	do.....	8 $\frac{1}{2}$	1	0	1	Young ones hatched on third day, 50 in number.
7	do.....	30 gm. to 500 cubic feet.	$\frac{1}{2}$	5	5	0	No females.
8	do.....	do.....	1	10	10	0	Do.
9	do.....	do.....	2	10	10	0	Do.
10	do.....	do.....	4	10	10	0	Do.
11	do.....	do.....	18	100	100	0	3 females.
12	do.....	22 gm. to 500 cubic feet.	$\frac{1}{2}$	9	5	4	No females.
	do.....	do.....	10	4	1	3	
13	do.....	do.....	1	25	19	6	2 females.
	do.....	do.....	24	6	4	2	
	do.....	do.....	1	2	1	1	Survived 3 exposures.
14	do.....	do.....	2	12	11	1	No females.
15	do.....	do.....	28	5	4	1	Do.
	do.....	do.....	2	1	0	1	

TABLE 1.—Results of exposure of *Blatella germanica* to various fumigants—Con.

No.	Chemical	Amount	Time	Number of roaches	Number killed	Number alive	Remarks
16	Zyklon-B	22 gm. to 500 cubic feet.	Hours	8	4	4	No females.
	do	do	23	4	2	2	
	do	do	1	2	0	0	
17	Liquid HCN, 10 per cent chloropicrin.	15 gm. to 500 cubic feet.	8	2	0	2	1 female.
	do	do	1	3	3	0	
	do	do	1	200	170	30	
18	do	do	2	30	10	20	Several females.
	do	do	1	20	17	3	
	do	do	1	10	10	0	
19	do	do	1	10	10	0	1 female; young ones hatched on third day.
	do	do	1 1/2	20	20	0	
	do	do	1 1/2	40	37	3	
20	do	do	1 1/2	3	2	1	16 young ones hatched on twenty-eighth day.
	do	do	1 1/2	1	0	1	
	do	do	2 1/2	15	15	0	
21	do	do	1 1/2	15	15	0	3 females; young ones hatched on third day.
	do	do	1 1/2	30	30	0	
	do	do	1 1/2	30	30	0	
22	do	do	1 1/2	15	15	0	5 females; young ones hatched on third day.
	do	do	1 1/2	15	15	0	
	do	do	1 1/2	15	15	0	
23	do	do	1 1/2	15	15	0	2 females.
	do	do	1 1/2	5	5	0	
	do	do	1 1/2	7	7	0	
24	do	do	1 1/2	7	7	0	No females.
	do	do	1 1/2	7	7	0	
	do	do	1 1/2	7	7	0	
25	do	do	1 1/2	25	24	1	3 females.
	do	do	1 1/2	25	24	1	
	do	do	1 1/2	25	24	1	
26	do	do	1 1/2	5	3	2	2 females.
	do	do	1 1/2	5	3	2	
	do	do	1 1/2	5	3	2	
27	do	do	1 1/2	6	6	0	No females.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
28	do	do	1 1/2	6	6	0	2 females; 10 young ones hatched on seventeenth day.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
29	do	do	1 1/2	6	6	0	2 females.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
30	do	do	1 1/2	6	6	0	3 females.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
31	do	do	1 1/2	6	6	0	1 female.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
32	do	do	1 1/2	6	6	0	No female.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
33	do	do	1 1/2	6	6	0	10 females.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
34	do	do	1 1/2	6	6	0	3 females; young ones hatched on sixteenth day.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
35	do	do	1 1/2	6	6	0	2 females.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
36	do	do	1 1/2	6	6	0	1 female.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
37	do	7.5 gm. to 500 cubic feet.	1 1/2	8	2	6	2 females.
	do	do	1	6	0	6	
	do	do	1 1/2	10	4	6	
38	do	do	1 1/2	6	0	6	1 female.
	do	do	1	6	0	6	
	do	do	19	6	0	6	
37-A	do	13 gm. to 500 cubic feet.	1 1/2	6	3	3	2 females.
	do	do	1	3	2	1	
	do	do	1 1/2	6	3	3	
38-A	do	do	1 1/2	6	3	3	1 female.
	do	do	1	3	0	3	
	do	do	5	3	0	3	
39	do	do	15	3	1	2	Young ones hatched on fifteenth day.
	do	do	15	3	1	2	
	do	do	15	3	1	2	
39-A	do	7.5 gm. to 500 cubic feet.	1 1/2	40	20	20	Several females.
	do	13 gm. to 500 cubic feet.	1 1/2	10	10	0	
	do	22.5 gm. to 500 cubic feet.	1 1/2	8	4	4	
40	do	do	1 1/2	8	4	4	2 females.
	do	do	1	4	0	4	
	do	do	1 1/2	12	5	7	
41	do	do	1	7	0	7	1 female.
	do	do	1	7	0	7	
	do	do	1	7	0	7	
42	do	do	1 1/2	3	1	2	No females.
	do	do	1 1/2	6	4	2	
	do	do	1 1/2	2	0	2	
43	do	do	1 1/2	2	0	2	Do.
	do	do	1 1/2	2	0	2	
	do	do	1 1/2	2	0	2	
44	do	15 gm. to 500 cubic feet.	1 1/2	8	8	0	2 females.
	do	do	1 1/2	8	8	0	
	do	do	1 1/2	8	8	0	
45	do	do	1 1/2	13	13	0	4 females.
	do	do	1 1/2	12	12	0	
	do	do	1 1/2	6	6	0	
46	do	do	1 1/2	6	6	0	Do.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
47	do	do	1 1/2	6	6	0	No females.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	
48	Liquid HCN, 20 per cent CNCl.	do	1 1/2	8	5	3	2 females.
	do	do	1 1/2	8	5	3	
	do	do	1 1/2	8	5	3	
49	do	do	1 1/2	3	0	3	2 females.
	do	do	2	3	2	1	
	do	do	1 1/2	3	1	2	
50	do	do	1 1/2	2	0	2	2 females.
	do	do	1 1/2	2	0	2	
	do	do	1 1/2	2	0	2	
51	do	do	1 1/2	6	6	0	No females.
	do	do	1 1/2	6	6	0	
	do	do	1 1/2	6	6	0	

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No.	Chemical	Amount	Time	Number of roaches	Number killed	Number alive	Remarks
52	Liquid HCN, 20 per cent CNCl.	15 gm. to 500 cubic feet.	Hours 1/2	4	3	1	No females.
53	do	do	1	3	1	2	2 females.
54	do	do	22	2	0	2	
55	do	do	1	4	1	3	1 female.
56	do	22.5 gm. to 500 cubic feet.	1	4	3	1	2 females.
58	do	do	1	12	7	5	1 female.
59	Liquid HCN, 10 per cent chloropicrin.	do	1	5	3	2	Do.
60	do	do	2	5	4	1	No females.
61	do	do	2	12	11	1	3 females.
62	do	do	2	10	8	2	1 female.
63	do	do	2	20	19	1	Do.
64	do	do	2	7	6	1	No females.
65	Zyklon-B, 5 per cent chloropicrin.	30 gm. to 500 cubic feet.	1	30	29	1	8 females.
66	do	do	1	4	4	0	1 female.
67	do	do	1	2	2	0	Do.
68	do	do	1	10	10	0	Do.
69	do	do	1	1	1	0	Do.
70	do	do	1	30	30	0	7 females.
71	do	do	1	7	7	0	1 female.
72	do	do	1	5	5	0	Do.
73	do	do	1	8	8	0	No females.
74	do	do	1	5	5	0	1 female.
75	Liquid HCN, 10 per cent chloropicrin.	do	1	2	2	0	No females.
76	do	do	1	7	7	0	Do.
77	do	do	1	5	0	5	1 female.
78	do	do	1	4	4	0	Do.
79	do	do	2	18	13	0	6 females.
80	do	do	2	7	7	0	1 female.
81	do	do	2	6	4	2	No females.
82	do	22.5 gm. to 500 cubic feet.	4	2	2	0	Do.
83	Zyklon-B, 5 per cent chloropicrin.	30 gm. to 500 cubic feet.	1	6	6	0	Do.
84	do	do	1	2	2	0	Do.
85	do	do	1	3	3	0	Do.
86	do	do	1	5	5	0	Do.
87	HCN generated	Sod. cy., 60 gm.; sulphuric acid, 90 gm.; water, 120 gm.	1	5	3	2	1 female.
88	do	do	1	3	3	0	No females.
89	do	do	1	4	4	0	Do.
90	do	do	1	10	8	2	Do.
91	do	do	1	9	9	0	3 females.
92	do	Sod. cy., 45 gm.; sulphuric acid, 67.5 gm.; water, 90 gm.	1	6	6	0	2 females.
93	do	do	1	6	6	0	No females.
94	do	do	1	2	2	0	Do.
95	do	do	1	3	2	1	1 female.
96	do	do	1	4	3	1	No females.
97	do	do	2	4	2	2	3 females.
98	do	do	2	3	1	2	1 female.
99	do	do	2	8	6	2	No females.
100	do	do	2	11	11	0	4 females.
101	do	Sod. cy., 60 gm.; sulphuric acid, 90 gm.; water, 120 gm.	2	1	1	0	No females.
102	do	do	2	21	21	0	4 females.
103	do	do	2	35	35	0	7 females.
104	do	do	2	20	20	0	2 females.
105	do	do	2	20	20	0	4 females.
106	do	do	2	22	22	0	No females.
107	do	do	2	14	14	0	1 female.
108	do	do	2	18	18	0	2 females.
109	do	do	2	30	30	0	6 females.
110	do	do	2	40	40	0	7 females.
111	do	do	2	11	11	0	8 females.
112	do	do	2	7	7	0	2 females.
113	do	do	2	45	45	0	8 females.
114	Liquid HCN, 20 per cent CNCl.	30 gm. to 500 cubic feet.	2	10	10	0	2 females.
115	do	do	2	5	4	1	1 female.
116	do	do	2	8	8	0	No females.
	do	do	2	4	4	0	Do.

TABLE 1.—Results of exposure of *Blatella germanica* to various fumigants—Con.

No.	Chemical	Amount	Time	Number of roaches	Number killed	Number alive	Remarks
117	Liquid HCN, 20 per cent CNCL	30 gm. to 500 cubic feet.	Hours 2	1	6	2	4 females.
118	do.	do.	2	26	23	3	7 females.
119	do.	do.	2	18	18	0	8 females.
120	do.	do.	2	20	15	5	6 females.
121	do.	do.	2	20	19	1	7 females.
122	do.	do.	2	12	12	0	8 females.
123	do.	do.	2	20	20	0	16 females
124	do.	do.	2	12	10	2	1 female.
125	do.	do.	2	16	15	1	4 females.
128	do.	do.	2	3	2	1	1 female.
129	do.	do.	2	22	21	1	8 females.
131	do.	do.	2	6	5	1	3 females.
132	do.	do.	2	2	2	0	No females.
133	do.	do.	2	6	6	0	Do.
134	do.	do.	2	24	22	2	5 females.
135	do.	do.	2	10	10	0	4 females.
136	do.	45 gm. to 500 cubic feet.	2	6	6	0	1 female.
138	do.	30 gm. to 500 cubic feet.	2	9	8	1	No females.
139	do.	do.	2	10	8	2	3 females.
140	do.	do.	2	5	4	1	1 female.
141	do.	45 gm. to 500 cubic feet.	7	11	11	0	Do.
142	do.	do.	7	5	5	0	No females.
143	do.	do.	7	18	18	0	8 females.
144	do.	do.	7	16	16	0	4 females.
145	do.	do.	7	18	18	0	2 females.
146	do.	do.	7	30	30	0	11 females.
147	do.	do.	7	20	20	0	3 females.
148	do.	do.	2	22	21	1	Do.
149	do.	do.	2	27	25	2	No females.
150	do.	do.	2	15	13	2	Do.
151	do.	do.	2	12	12	0	1 female.
152	do.	do.	2	8	8	0	No females.
153	do.	do.	2	12	9	3	1 female.
154	do.	do.	2	12	10	2	No females.
155	do.	do.	2	13	13	0	Do.
156	do.	do.	2	30	30	0	2 females.
157	do.	do.	2	20	20	0	1 female.
158	do.	do.	2	44	44	0	12 females.
159	do.	do.	2	37	37	0	4 females.
160	do.	do.	2	9	9	0	2 females.
161	do.	do.	2	11	11	0	3 females.
162	do.	do.	2	15	15	0	4 females.
163	do.	do.	2	16	16	0	5 females.
164	do.	do.	2	10	10	0	3 females.
165	do.	do.	2	17	17	0	5 females.
166	do.	do.	2	10	4	6	2 females.
167	do.	do.	2	16	15	1	Do.
168	do.	do.	2	23	23	0	6 females.
169	do.	do.	2	14	14	0	2 females.
170	do.	do.	2	12	12	0	1 female.
171	do.	do.	2	15	11	4	3 females.
172	do.	do.	2	11	5	6	7 females.
173	HCN-CNCL generated.	Sod. cy., 60 gm.; sod. chlor., 45 gm.; HCl, 255 gm.; water, 255 gm.	2	18	17	1	4 females.
174	do.	do.	2	16	15	1	No females.
175	do.	do.	2	17	14	3	1 female.
176	do.	do.	2	18	16	2	3 females.
177	do.	do.	2	14	12	2	Do.
178	do.	do.	2	8	4	4	4 females.
179	do.	do.	2	35	35	0	9 females.
180	do.	do.	2	12	0	12	7 females.
181	do.	do.	2	12	4	8	3 females.
182	do.	do.	2	16	13	3	7 females.
183	do.	do.	2	6	0	6	3 females.
184	do.	do.	2	8	2	6	4 females.
185	do.	do.	2	12	8	4	Do.
186	do.	do.	2	12	6	6	8 females.
187	do.	do.	2	10	10	0	No females.
189	do.	do.	2	13	12	1	6 females.
190	do.	do.	2	38	36	2	3 females.
191	do.	do.	2	7	6	1	Do.
192	do.	do.	2	10	10	0	7 females.

TABLE 1.—Results of exposure of *Blatella germanica* to various fumigants—Con.

No.	Chemical	Amount	Time	Number of roaches	Number killed	Number alive	Remarks
193	HCN-CNCl generated.	Sod. cy., 90 gm.; sod. chlor., 60 gm.; HCl, 255 gm.; water, 255 gm.	Hours 2	9	4	5	4 females.
194	do.	do.	2	5	3	2	3 females.
195	do.	do.	2	9	8	1	No females.
196	do.	do.	2	9	8	1	Do.
197	do.	do.	2	8	7	1	Do.
198	do.	do.	2	11	8	3	2 females.
199	do.	do.	2	26	21	5	Do.
200	HCN generated.	Sod. cy., 60 gm.; sulphuric acid, 90 gm.; water, 120 gm.	2	9	8	1	4 females.
201	do.	do.	2	10	8	2	Do.
202	do.	do.	2	9	8	1	1 female.
203	do.	do.	2	8	8	0	No females.
204	do.	do.	2	7	7	0	Do.
205	do.	do.	2	7	6	1	1 female.
206	do.	do.	2	7	7	0	No females.
207	do.	do.	2	13	13	0	4 females.
208	do.	do.	2	10	10	0	2 females.
209	do.	do.	2	12	11	1	3 females.
210	do.	do.	2	7	7	0	2 females.
211	do.	do.	2	9	8	1	3 females.
212	do.	do.	2	14	11	3	6 females.
213	do.	do.	2	12	9	3	7 females.
214	do.	do.	2	8	8	0	1 female.
215	do.	do.	2	11	11	0	Do.
216	do.	do.	2	9	9	0	Do.
217	do.	do.	2	10	8	2	No females.
218	do.	do.	2	18	18	0	Do.
219	do.	do.	2	20	17	3	3 females.
220	do.	do.	2	20	20	0	4 females.
221	do.	do.	2	5	4	1	No females.
222	do.	do.	2	9	9	0	Do.
223	do.	do.	2	5	5	0	Do.
224	do.	do.	4	8	7	1	4 females.
225	do.	do.	4	11	9	2	Do.
226	do.	do.	4	14	11	3	3 females.
227	do.	do.	4	12	9	3	No females.
228	do.	do.	4	12	10	2	3 females.
229	do.	do.	4	9	9	0	2 females.
230	do.	do.	4	10	9	1	No females.
231	Liquid HCN, 20 per cent CNCl.	30 gm. to 500 cubic feet.	4	12	11	1	1 female.
232	do.	do.	4	10	9	1	3 females.
233	do.	do.	4	10	8	2	1 female.
234	do.	do.	4	12	10	2	4 females.
235	do.	do.	4	13	11	2	2 females.
236	do.	do.	4	7	3	4	3 females.
237	do.	do.	4	13	13	0	Do.
238	do.	do.	4	17	17	0	Do.
239	do.	do.	4	9	9	0	1 female.
240	do.	do.	4	7	7	0	Do.
241	do.	do.	4	11	10	1	No females.
242	do.	do.	4	11	11	0	Do.
243	do.	do.	4	6	6	0	Do.
244	do.	do.	4	6	5	1	1 female.
245	do.	do.	4	10	10	0	2 females.
246	do.	do.	4	9	9	0	3 females.
247	do.	do.	4	10	8	2	Do.
248	do.	do.	4	17	17	0	7 females.
249	do.	do.	4	8	8	0	No females.
250	do.	do.	4	9	9	0	2 females.
251	do.	do.	4	11	11	0	4 females.
252	do.	do.	5	20	18	2	2 females.
253	do.	do.	5	13	13	0	Do.
254	do.	do.	5	7	7	0	1 female.
255	do.	do.	5	12	11	1	4 females.
256	do.	do.	5	16	14	2	8 females.
257	do.	do.	5	16	11	5	6 females.
258	do.	do.	5	10	9	1	4 females.
259	Liquid HCN, 5 per cent chloropicrin.	do.	4	18	18	0	No females.
260	do.	do.	4	10	10	0	Do.
261	do.	do.	4	7	7	0	Do.
262	do.	do.	4	6	6	0	1 female.
263	do.	do.	4	7	7	0	Do.
264	do.	do.	4	6	6	0	No females.
265	do.	do.	4	8	8	0	2 females.

TABLE 1.—Results of exposure of *Blatella germanica* to various fumigants—Con.

No.	Chemical	Amount	Time	Number of roaches	Number killed	Number alive	Remarks
			<i>Hours</i>				
266	Liquid HCN, 20 per cent CNCL.	30 gm. to 500 cubic feet.	4	6	5	1	1 female.
267	do	do	4	7	6	1	2 females.
268	do	do	4	6	5	1	Do.
269	do	do	4	9	9	0	No females.
270	Liquid HCN, 5 per cent chloropicrin.	do	4	26	26	0	2 females.
272	do	do	4	14	14	0	Do.
275	do	do	4	2	2	0	1 female.
276	do	do	4	7	7	0	2 females.
277	do	do	17	7	7	0	Do.
278	do	do	17	6	7	0	No females.
279	do	do	17	7	7	0	3 females.
281	do	do	17	10	10	0	4 females.
283	do	do	4	18	18	0	3 females.
284	do	do	4	15	15	0	3 females.
285	do	do	4	12	12	0	2 females.
286	do	do	4	16	16	0	9 females.
287	do	do	4	16	16	0	4 females.
288	do	do	4	12	12	0	1 female.
289	do	do	4	14	14	0	3 females.
290	do	do	2	16	16	0	Do.
291	do	do	2	12	11	1	2 females.
292	do	do	2	10	10	0	1 female.
293	do	do	2	12	12	0	5 females.
294	do	do	2	13	13	0	4 females.
295	do	do	2	18	18	0	3 females.
296	do	do	2	34	34	0	5 females.
297	do	do	2	6	6	0	No females.
298	do	do	2	7	7	0	2 females.
299	do	do	2	9	9	0	1 female.
300	do	do	2	14	14	0	3 females.
301	do	do	2	7	6	1	1 female.
302	do	do	2	5	5	0	No females.
303	do	do	2	22	22	0	10 females.
304	do	do	2	8	8	0	2 females.
305	do	do	2	6	6	0	1 female.
306	do	do	2	3	3	0	Do.
307	do	do	2	7	7	0	2 females.
308	do	do	2	6	6	0	Do.
309	do	do	2	12	12	0	6 females.

TABLE 2.—Results of exposure of *Periplaneta americana* to certain fumigants

Number	Chemical	Amount	Time	Number of roaches	Number killed	Number alive	Remarks
1	Zyklon-B.	15 gm. to 500 cubic feet.	<i>Hours</i> ¾	1	1	0	No females.
57	Liquid HCN, 20 per cent CNCL.	22.5 gm. to 500 cubic feet.	1	5	2	3	Do.
	do	do	4	3	1	2	
158-A	Generated HCN-CNCL.	Sod. cy., 60 gm., sod. chlor. 45 gm., HCl, 255 gm., water, 255 gm.	2	7	6	1	1 female.
271	Liquid HCN with 5 per cent chloropicrin.	30 gm. to 500 cubic feet.	4	9	9	0	No females.
274	do	do	4	4	4	0	Do.
280	do	do	17	3	3	0	Do.

TABLE 3.—Results of exposure of *Blatta orientalis* to various fumigants

Number	Chemical	Amount	Time	Number of roaches	Number killed	Number alive	Remarks
17	Liquid HCN, 10 per cent chloropicrin.	15 gm. to 500 cubic feet....	Hours 1	6	1	5	No females.
	do.....	do.....	2	5	3	2	
	do.....	do.....	1	2	0	2	
	do.....	do.....	14½	2	0	2	
	do.....	do.....	½	2	1	1	
	do.....	do.....	2	1	0	1	
	do.....	do.....	21	1	0	1	
	do.....	do.....	2	1	0	1	Survived 8 exposures.
36-A	Liquid HCN, 20 per cent CNCl.	do.....	½	1	0	1	No females.
126	Liquid HCN, 10 per cent chloropicrin.	30 gm. to 500 cubic feet....	2	3	0	3	Do.
127	do.....	do.....	2	3	0	3	Do.
130	do.....	do.....	2	3	0	3	Do.
137	do.....	do.....	2	12	8	4	Do.
188	Generated HCN-CNCl.	45 gm. to 500 cubic feet. Sod. cy. 60 gm., sod. chlor. 45 gm., HCl, 255 gm., water 255 gm.	2	4	3	1	Do.
273	Liquid HCN, 5 per cent chloropicrin.	30 gm. to 500 cubic feet....	4	2	2	0	Do.
282	do.....	do.....	17	4	4	0	Do.

TABLE 4.—Results of exposure of *Blattella germanica* to generated straight hydrocyanic acid

Amount of fumigant	Time of exposure	Number of exposures	Positive results, all killed	Negative results, some survived
	Hours			
Sodium cyanide 60 gm., sulphuric acid 90 gm., water 120 gm., to 500 cubic feet.	1	5	3	2
	2	38	27	11
	4	7	1	6
Sodium cyanide 45 gm., sulphuric acid 67.5 gm., water 90 gm., to 500 cubic feet.	1	5	3	2
	2	4	1	3

TABLE 5.—Results of exposure of *Blattella germanica* to generated hydrocyanic acid-cyanogen chloride mixture

Amount of fumigant	Time of exposure	Number of exposures	Positive results, all killed	Negative results, some survived
	Hours			
Sodium cyanide 60 gm., sodium chlorate 45 gm., hydrochloric acid 255 gm., water 255 gm.	2	19	3	16
Sodium cyanide 90 gm., sodium chlorate 60 gm., hydrochloric acid 255 gm., water 255 gm.	2	7	0	7

TABLE 6.—Results of exposure of *Blattella germanica* to liquid hydrocyanic acid with 10 per cent chloropicrin as tear gas

Amount of fumigant	Time of exposure	Number of exposures	Positive results, all killed	Negative results, some survived or eggs hatched
7.5 gm. to 500 cubic feet.....	<i>Hours</i>			
	1/2	3	0	3
	1	2	0	2
13 gm. to 500 cubic feet.....	19	1	0	1
	1/2	3	1	2
	1	2	0	2
15 gm. to 500 cubic feet.....	5	1	0	1
	15	1	0	1
	1/2	13	10	3
30 gm. to 500 cubic feet.....	3/4	5	3	2
	1	4	1	3
	1 1/2	4	4	3
22.5 gm. to 500 cubic feet.....	2	2	0	2
	1	5	3	2
	2	3	2	1
	1/2	4	0	4
	1	3	0	3
	2	5	0	5
	4	2	2	0

TABLE 7.—Results of exposure of *Blattella germanica* to liquid hydrocyanic acid with 20 per cent cyanogen-chloride as tear gas

Amount of fumigant	Time of exposure	Number of exposures	Positive results, all killed	Negative results, some survived
15 gm. to 500 cubic feet.....	<i>Hours</i>			
	1/2	7	1	6
	1	3	0	3
	2	1	0	1
22.5 gm. to 500 cubic feet.....	22	1	0	1
	1	2	0	2
30 gm. to 500 cubic feet.....	2	22	8	14
Do.....	4	25	16	9
Do.....	5	7	2	5
45 gm. to 500 cubic feet.....	2	26	17	9
	7	7	7	0

TABLE 8.—Results of exposure of *Blattella germanica* to liquid hydrocyanic acid with 5 per cent chloropicrin as tear gas

Amount of fumigant	Time of exposure	Number of exposures	Positive results, all killed	Negative results, some survived
30 gm. to 500 cubic feet.....	<i>Hours</i>			
	2	20	18	2
	4	18	18	0
Do.....	17	4	4	0

TABLE 9.—Results of exposure of *Blattella germanica* to Zyklon-B with 5 per cent chloropicrin

Amount of fumigant	Time of exposure	Number of exposures	Positive results, all killed	Negative results, some survived or eggs hatched
15 gm. to 500 cubic feet.....	Hours			
	1½	2	0	2
	¾	1	0	1
	1	1	0	1
	8	1	0	1
	8½	3	0	3
22.5 gm. to 500 cubic feet.....	15½	2	0	2
	16	1	0	1
	32½	2	0	2
	½	1	0	1
	1	3	0	3
	2	2	0	2
30 gm. to 500 cubic feet.....	8	1	0	1
	10	1	0	1
	24	1	0	1
	28	2	0	2
	½	1	1	0
	1	13	13	0
	2	1	1	0
	4	1	1	0
	18	1	1	0

TABLE 10.—Results of exposure of *Periplaneta americana* to certain fumigants

Fumigant	Amount	Time of exposure	Number of exposures	Positive results, all killed	Negative results, some survived
Generated HCN-CNCl.....	Sodium cyanide 60 gm., sodium chlorate 45 gm., hydrochloric acid 255 gm., water 255 gm.	Hours			
		2	1	0	1
Liquid HCN, 20 per cent CNCl.	22.5 gm. to 500 cubic feet.....	1	1	0	1
		4	1	0	1
Zyklon-B, 5 per cent chloropicrin.	15 gm. to 500 cubic feet.....	¾	1	1	0
Liquid HCN, 5 per cent chloropicrin.	30 gm. to 500 cubic feet.....	4	2	2	0
		17	1	1	0

TABLE 11.—Results of exposure of *Blatta orientalis* to certain fumigants

Fumigant	Amount	Time of exposure	Number of exposures	Positive results, all killed	Negative results, some survived
Generated HCN-CNCl.....	Sodium cyanide 60 gm., sodium chlorate 45 gm., hydrochloric acid 255 gm., water 255 gm.	Hours			
		2	1	0	1
Liquid HCN, 10 per cent chloropicrin.	15 gm. to 500 cubic feet.....	½	2	0	2
		1	2	0	2
		2	2	0	2
		14½	1	0	1
		21	1	0	1
Liquid HCN, 20 per cent CNCl.	15 gm. to 500 cubic feet.....	2	1	0	1
	30 gm. to 500 cubic feet.....	2	3	0	3
	45 gm. to 500 cubic feet.....	2	1	0	1
Liquid HCN, 5 per cent chloropicrin.	30 gm. to 500 cubic feet.....	4	1	1	0
		17	1	1	0

COMMENT

It will be noted from the tables that negative results are recorded when only one or two roaches from a cage survived the exposure. It has happened many times that all roaches were apparently dead immediately after the exposure, but a few recovered enough to move about by the next day. Many roaches appeared to be partly paralyzed after fumigation, able only to kick their legs or move feebly, and never become active. Roaches were not fed before or after fumigation, and yet many survived for two weeks or more apparently without food. They were never observed to feed upon the dead roaches in the same container.

These experiments indicate that the amount of straight hydrocyanic acid gas generated from 120 gm. of sodium cyanide per 1,000 cubic feet can not be depended upon to kill all the roaches in a 2 or 4 hour exposure. Several live roaches were seen after exposure, but eggs were not observed to hatch.

After a 2-hour exposure to the gas generated from 180 gm. of sodium cyanide and 120 gm. of sodium chlorate per 1,000 cubic feet, live roaches were observed, but no eggs hatched.

Exposure to liquid hydrocyanic acid with 10 per cent chloropicrin in the proportion of 60 gm. or less per 1,000 cubic feet was not thoroughly effective in killing all roaches. Eggs hatched after exposure to 30 gm. per 1,000 cubic feet.

Exposure to liquid hydrocyanic acid with 20 per cent cyanogen-chloride in the proportion of 90 gm. or less per 1,000 cubic feet was not entirely effective in killing all roaches after a 2-hour exposure. Neither was an exposure in the proportion of 60 gm. per 1,000 cubic feet for 4 or 5 hours effective. Exposure to 90 gm. per 1,000 cubic feet for 7 hours was effective.

Liquid hydrocyanic acid with 5 per cent chloropicrin was effective in killing roaches in 18 out of 20 tests using 60 gm. per 1,000 cubic feet for 2 hours. This same amount was entirely effective in 18 tests when the exposure was for 4 hours.

Zyklon-B in the proportion of 60 gm. per 1,000 cubic feet for 1 hour exposure was effective in killing all roaches in 13 tests. Eggs were seen to hatch after exposure to this chemical in the amount of 30 gm. per 1,000 cubic feet.

It is thus seen that Zyklon-B and liquid hydrocyanic acid with 5 per cent chloropicrin probably have equal lethal effect and are effective in killing roaches in the proportion of 60 gm. per 1,000 cubic feet during a 2-hour exposure. This is the usual time of exposure for an empty vessel.

REFERENCES

- (1) Fox, Carroll: *Insects and Diseases of Man*, 1925.
- (2) Pryor, J. C.: *Naval Hygiene*. 1918.
- (3) Toda, T.: Cholera and the ship cockroach.—Cockroaches and ants as carriers of vibrios of Asiatic cholera. *Jour. Hyg.*, 21, pp. 359-361, August, 1923.
- (4) Barber, M. A.: *Philippine Jour. of Science*, IX, pp. 1-4.
- (5) Macfie, J. W. S.: Observations on the rôle of cockroaches in disease. *Annals of Trop. Med.* No. 16, pp. 441-448, December, 1922.
- (6) Morrell, C. C.: The bacteriology of the cockroach. *British Med. Jour.*, 1911, Vol. II, p. 1531.
- (7) Longfellow, R. C.: The common house roach as a carrier of disease. *Am. Jour. Pub. Health*, 1913, Vol. III, p. 58.
- (8) Rice, C. E.: Destruction of cockroaches and devitalization of their eggs by cyanogen chloride mixture. *Pub. Health Rep.*, 40, pp. 1808-1811. Aug. 28, 1925.
- (9) Neifert, I. E., and Garrison, G. T.: Experiments on the toxic action of certain gases on insects, seeds, and fungi. *U. S. Department of Agriculture Bulletin No. 893*, 1920.

PUBLIC HEALTH SERVICE PUBLICATIONS
A List of Publications Issued During the Period January-June, 1931

There is printed herewith a list of publications of the United States Public Health Service issued during the period January-June, 1931.

The most important articles that appear each week in the Public Health Reports are reprinted in pamphlet form, making possible a wider and more economical distribution of information that is of especial value and interest to public-health workers and the general public.

All of the publications listed below except those marked with an asterisk (*) are available for free distribution and, as long as the supply lasts, may be obtained by addressing the Surgeon General, United States Public Health Service, Washington, D. C. Those publications marked with an asterisk are not available for free distribution but may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., *at the prices noted*. (No remittances should be sent to the Public Health Service.)

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1440. *The National Leper Home (United States Marine Hospital), Carville, La.* Review of the more important activities during the fiscal year ended June 30, 1930. By O. E. Denney. January 2, 1931. 8 pages.
1441. *The Occurrence of Tularaemia in British Columbia*. By R. R. Parker, Eric Hearle, and E. A. Bruce. January 9, 1931. 2 pages.
1442. *Effect on Life Insurance Mortality Rates of Rejection of Applicants on the Basis of Medical Examination*. By Rollo H. Britten. January 9, 1931. 17 pages.

1443. Age Incidence of Communicable Diseases in a Rural Population. By Edgar Sydenstricker and Selwyn D. Collins. January 16, 1931. 14 pages.
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1446. Public Health Service publications. A list of publications issued during the period July-December, 1930. January 30, 1931. 5 pages.
1447. The Work of the United States Public Health Service. February 6, 1931. 30 pages.
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National Institute of Health Bulletin

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SPECIAL COURSE IN CLINICAL TROPICAL MEDICINE

Hospital for Tropical Diseases, London

The Fellowship of Medicine and Post-Graduate Medical Association announces that a special course in clinical tropical medicine will be given at the Hospital for Tropical Diseases, London, during the period October 5-23, 1931. The course will consist of special lectures and demonstrations, with specimens, charts, lantern slides, and demonstrations of clinical cases where possible, and will include the following subjects: Enteric fever, undulant fever, phlebotomus fever, dengue fever, yellow fever, beriberi, pellagra, amebic abscess, heat-stroke, yaws, ulcerating granuloma, climatic bubo, filariasis, differential diagnosis of fevers, etc.

Further information regarding this course may be obtained by addressing the secretary, Fellowship of Medicine and Post-Graduate Medical Association, No. 1 Wimpole Street, W. 1., London.

DEATHS DURING WEEK ENDED JUNE 20, 1931

Summary of information received by telegraph from industrial insurance companies for the week ended June 20, 1931, and corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce.)

	Week ended June 20, 1931	Corresponding week, 1930
Policies in force.....	75, 172, 566	75, 896, 166
Number of death claims.....	13, 023	13, 544
Death claims per 1,000 policies in force, annual rate..	9. 0	9. 3