

**Sanitation Practices
and
Vector Control at National Boy Scout
jamborees**

CLYDE F. FEHN, M.S., and DARRELL R. MADDOCK, M.S.

EFFECTIVE vector control and sanitation practices permitted large, transient populations attending the 13-day National Boy Scout Jamborees to live, eat, and sleep outdoors free of annoyance from flies and mosquitoes.

Experience gained at the 1953 jamboree in Orange County, Calif., attended by 43,000, and at the 1957 event, in Valley Forge State Park, Pa., attended by 51,000, can be applied to other mass gatherings, such as recreational, educational, and religious encampments, and used in civil defense planning and in natural disasters.

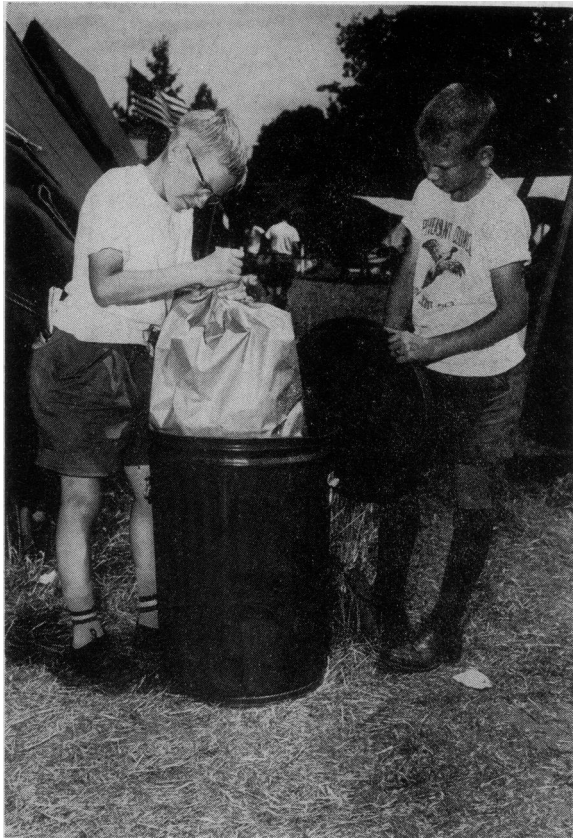
Mr. Fehn is a sanitary engineer and Mr. Maddock is a medical entomologist with the Technical Development Laboratories, Communicable Disease Center, Public Health Service, at Savannah, Ga.

In cooperation with environmental sanitation personnel of State and local health departments, Mr. Fehn was responsible for vector control and related operations at the 1953 and 1957 National Boy Scout Jamborees. Both authors were assigned by the Public Health Service to the Boy Scouts of America for this task.

Both Boy Scout jamboree camps were located in suburban areas near large cities. The Scouts attending were grouped in sections, 36 at the California encampment and 38 at the Pennsylvania one. Each section included approximately 34 troops, and each troop, 4 patrols. A patrol consisted of nine boys and an adult leader.

Each patrol cooked its meals on charcoal grills and used paper plates and other paper items for food service. Every section had a tent commissary for the storage and distribution of food and used three walk-in electric refrigerators, each with a capacity of 150 cubic feet. Camp leaders, firemen, policemen, and maintenance men ate at large tent-covered messes. Each camp had five trading posts equipped with hamburger grills and milk and soft drink dispensing units.

At both jamborees some houseflies from the surrounding areas were attracted to the trading posts and large messes. Only the trading posts in California were screened. Eating sites of patrols were free from flies except in a few



After meals Scouts put garbage in heavy paper bags inside plastic-coated cans. Later bags were placed on tarpaulins atop trucks.

instances when sanitation lapsed temporarily. Some rodents and ants appeared in the commissaries and large messes.

Water was obtained from large metropolitan supplies. The maximum consumption at the California jamboree was about 750,000 gallons or 17 gallons per person per day. Meters were not used in 1957; however, the system was designed for a maximum flow of 30 gallons per person per day. In California, leaks caused by troublesome above-ground water main couplings created mosquito-breeding areas. This hazard was reduced in Pennsylvania by placing the mains in trenches, at least 6 inches deep.

Each section had a cold water shower with the waste water piped to a remote low point, and a four-spigot water drawing station built over a small seepage pit. Water was carried in 5-gallon gasoline cans to two Lister bags, one for drinking water and one for washing, at each troop site.

For the disposal of waste wash water each troop site had a small sump covered with an expanded metal grate; large messes and trading posts used covered seepage pits. No difficulties with vectors developed around the water drawing stations, the Lister bags, or the disposal facilities for waste water.

Refuse Disposal

The refuse from the entire camp amounted to 650 cubic yards per day in California and 1,000 cubic yards per day in Pennsylvania. In California each troop was provided with three garbage cans which were placed at a central point for collection each night. Operational difficulties experienced with this system included scattering of refuse at the central storage points because of reduced nighttime supervision, excessive noise during sleeping hours, and failure to collect all refuse because of greater nighttime absenteeism of collection employees.

In Pennsylvania a more efficient system was used. Each troop was issued an inexpensive, 22-gallon, plastic-coated metal garbage can, and received a daily supply of four 50-pound wet-strength paper bags. Garbage was placed in the bags after each meal, and the bags were tied and taken to a 1½-ton stake-body truck, stationed at each section.

Each truck was equipped with a canvas tarpaulin with one end fastened to the tailgate and the other end tied by ropes to the top of the forward stakes. Refuse bags were placed on the top of the tarpaulin, and the trucks hauled them to the disposal site three times a day. The vehicles were unloaded by pulling on the upper end of the tarpaulin with a front-end loader, thus rolling out the refuse. Each truck bed was sprayed once a day with a mixture of 2 percent chlordane emulsion and a deodorant. There were few sanitation lapses in this system and no vector problems.

In California refuse was disposed of partly by burning, which attracted flies, and partly by sanitary landfill. At the 1957 jamboree all refuse was handled easily, without burning, in one sanitary landfill, and there were no difficulties with vectors.

Prior to the jamborees three holes, each 1 foot in diameter and 6 feet deep, were power-bored for each privy at the encampment site.

Each troop had a privy consisting of two toilets and one urinal in an unpainted wooden riser box enclosed by a tent.

In California it became necessary to spray the privies with 2 percent chlordane emulsion for the control of black widow spiders. By the end of the encampment several of the older privies had begun to produce houseflies. Large pit privies, used for male visitors, were difficult to maintain and were major fly attractants. Several were producing houseflies by the last day of the encampment.

Chemical toilets, furnished and serviced by a commercial firm, were provided for female visitors in California and for all visitors and headquarters staff members in Pennsylvania. At the 1957 jamboree, 110 chemical toilets were augmented by 22 tent-enclosed men's trough urinals discharging into small seepage pits. Both the chemical toilets and the tented urinals were highly satisfactory. It was not necessary to spray the bored hole privies, and vectors did not prove to be troublesome.

The majority of the Scouts slept on the ground in two-man tents. In California boys

were bitten by ants and were in fear of being bitten by black widow spiders. In Pennsylvania 186 cases of extremely painful ear invasions by adult beetles (Scarabaeidae) occurred in sleeping Scouts (1). The principal beetle involved was *Autoserica castanea* Arrow. There were a few invasions by *Cyclocephala borealis* Arrow. Cotton ear plugs were used as a control measure. No cases were reported in persons sleeping on cots.

Insecticide-Impregnated Cords

Adult houseflies were attracted to both camps from surrounding breeding sources. At the 1953 jamboree 2 percent chlordane emulsion applied to resting places at the trading posts and large messes controlled the flies. In 1957 flies were controlled more easily and effectively with 2,100 feet of commercially produced cotton cord $\frac{3}{32}$ inch in diameter, impregnated with parathion and Diazinon, which cost \$28. Cords were easily installed in the trading posts and large messes with a hand-operated staple tacker. The cords, about 20 linear feet per 100 square



A stake-truck is unloaded at the site of the sanitary landfill in Pennsylvania. A front-end loader pulls at the front end of the tarpaulin, rolling out refuse.

feet of floor area, were draped horizontally between tent posts or counter struts, or both, at heights of 8 to 10 feet. Vertical drop sections were not used. This amount of cord is somewhat less than the 30 linear feet per 100 square feet recommended by the Public Health Service (2-5).

Houseflies were repelled for about 5 minutes after the cord was hung, but subsequently they rested readily on the treated cord during the day and night. Control was obtained within a few hours. Excessive temperatures of hamburger grills in two trading posts caused grease to be deposited on the cords, making it necessary to replace them after 7 days.

Mosquitoes and Other Insects

Mosquitoes were controlled successfully at their breeding sites at both jamborees with DDT or chlordane emulsion larvicide applied by power sprayers. The California camp was located within the geographic jurisdiction of the Orange County Mosquito Abatement District and thus control work by Boy Scout authorities was not necessary.

The Pennsylvania area had no local mosquito control program. Accordingly, larviciding measures were started 5 weeks before the encampment, with 2 percent DDT or 1 percent chlordane emulsion. Sanitarians from the Pennsylvania Department of Health and the authors used a Public Health Service jeep-mounted power spray unit for this work.

Ants, black widow spiders, ticks, wasps, sand fleas, rodent ectoparasites, and a variety of other insects were controlled satisfactorily with 2 percent chlordane emulsion applied as a residual to the point of runoff. Chlordane is a broad spectrum insecticide of great usefulness in temporary encampments.

In 1946, plague was found in squirrel fleas taken from the encampment area in Orange County, Calif. The Orange County Department of Agriculture, in close cooperation with California health authorities, conducted extensive wild rodent eradication campaigns in 1952 and 1953. Just before the jamboree 5 percent dieldrin dust was applied by aircraft over the entire camp at the rate of 25 pounds of dust per acre to control rodent ectoparasites. These measures were highly effective.

Rodent Control

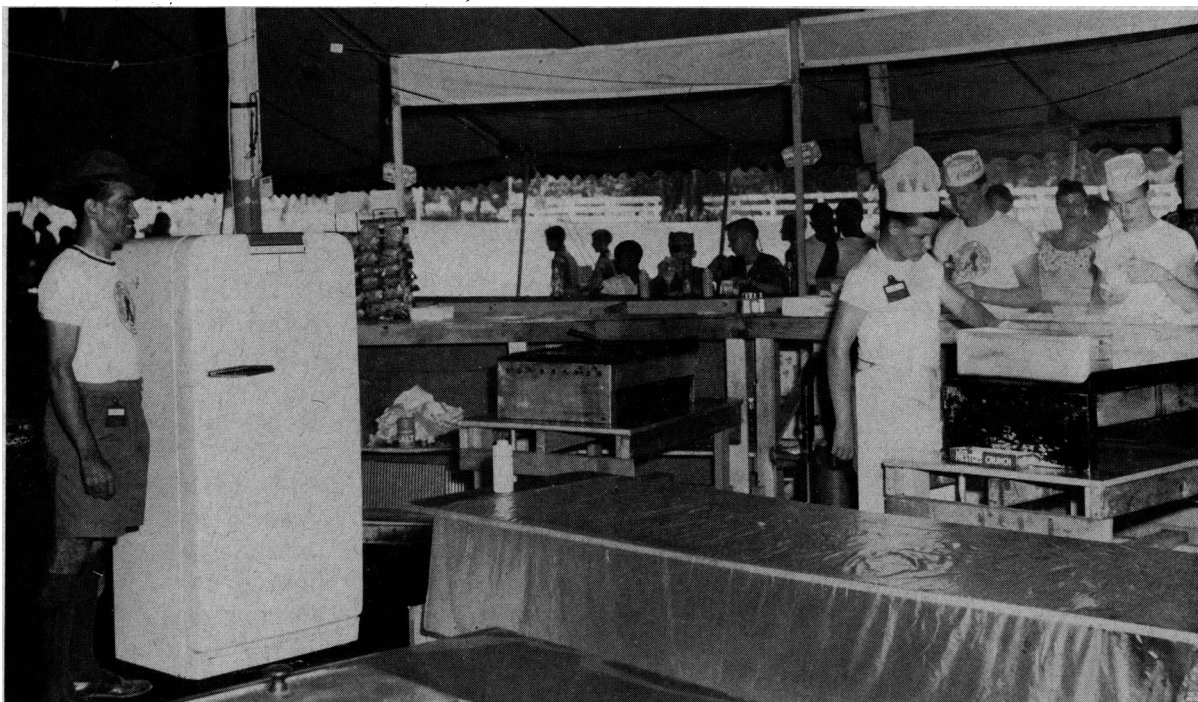
Warfarin was effective in safely controlling a wide variety of rodents including domestic rats, house mice, field mice, and gophers. Small, shallow paper plates containing 0.025 percent warfarin in cornmeal or rolled oats were placed in protected locations. Specially constructed bait stations were not used.

A few rodent bites, mostly on the hands, occurred when boys attempted to make pets of wild rodents found in the area or brought from home for trading.

When the nocturnal noise of rodents annoyed tent occupants, 2 percent chlordane emulsion was applied to the burrows, and openings were closed with earth. This treatment was effective in eliminating the annoyance. The chlordane probably acted as a repellent to drive the rodents to a new home in nearby woods or ravines and killed any rodent ectoparasites left behind.



Insecticide-impregnated cord is installed in a food serving area. A staple tacker is used to attach the cord to counter struts and posts.



Cotton cord impregnated with parathion and Diazinon controls houseflies at the unscreened trading post. Cord is strung horizontally above the refrigerator to the serving counter.

Equipment and Staff

A 4-wheel drive jeep equipped with power take-off mechanism, a 55-gallon stainless steel tank, a 50 p.s.i. insecticide pump, 150 feet of $\frac{3}{4}$ -inch rubber hose, and a spray gun, adjustable from solid spray to a fine mist, were suitable for most insect control operations. Hand spray cans were used to reach places inaccessible to the jeep. In addition, spray cans were lent to section leaders desiring to spray their areas.

All control work was done or closely supervised by professional staff members of the Public Health Service or the respective State health departments. Particular care was exercised when pesticides were applied or exposed near food. Each jamboree required four full-time staff members for vector control work.

Summary

The jamborees demonstrate that it is possible to eat, sleep, and live in the open free of annoyance from flies and mosquitoes. Excellent basic sanitation practices supplemented by the judicious application of pesticides were responsible for the control of these vectors.

Commercially prepared, insecticide-impregnated cords proved to be a cheap, easily installed, and effective housefly control measure in Pennsylvania. A power sprayer equipped with a long hose and mounted on a 4-wheel drive jeep was ideal for most insect control operations. Chlordane emulsion proved to be a satisfactory, broad spectrum insecticide.

Warfarin served as a safe, effective rodenticide against many different species of rodents.

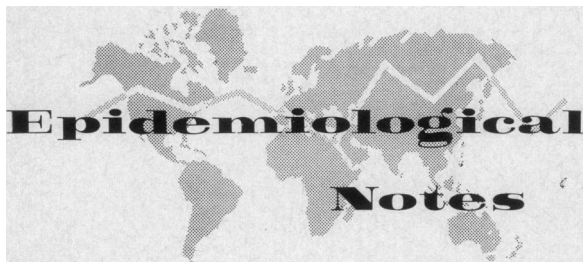
Elevated beds, such as cots, would be most useful in reducing contact with beetles, crawling insects, and small rodents. Certain beetles warrant consideration as public health nuisances in planning future encampments.

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Septicemia

Since 1948 there has been a perceptible increase in the number of deaths from septicemia. While the total is not large when compared with numbers of deaths from certain chronic diseases or tuberculosis, it is now larger than the number for most notifiable diseases. The mortality rate for septicemia doubled (0.4 to 0.8 per 100,000 population) during the period from 1949 to 1957.

As shown in the table, the number of deaths from staphylococcal septicemia rose steadily in the same period. On the other hand, the frequency of deaths from streptococcal septicemia declined while the number for pneumococcal septicemia remained stationary. The category for other specified types, which includes among other infections those caused by pseudomonas and coliform organisms, also increased substantially. A large proportion, more than two-thirds of the total septicemia deaths, were not identified as to type. These are designated as unspecified. The number of deaths in this category increased, especially in 1956 and 1957.

Sepsis of the newborn, that is, in infants under 1 month of age, is not included in the above categories. The numbers of deaths from this cause are shown in the last column. The trend in this group is also upward.—DR. CARL C. DAUER, *medical adviser, National Office of Vital Statistics, Public Health Service.*

Number of deaths from septicemia and pyemia in the United States, 1 month of age and over (053)							Sepsis under 1 month (767-768)
Year	Total	Staphylococcal	Streptococcal	Pneumococcal	Other specified	Unspecified	
1957	1,351	217	67	23	76	968	832
1956	1,118	160	64	23	54	817	662
1955	938	111	67	22	43	695	518
1954	897	109	62	19	44	663	485
1953	783	94	68	29	38	554	388
1952	726	79	72	24	31	520	356
1951	677	64	71	18	24	500	387
1950	616	62	76	20	29	429	320
1949	587	54	92	16	27	398	307

NOTE: Numbers in parentheses refer to International Classification of Diseases.