DISCUSSION

Jack L. Boese and Charles L. Wisseman, Jr.\(^1\) Dichlorvos-impregnated plastic strips for field disinfecting clothing of lice. Short-term projects conducted under primitive conditions in the field pose special problems for health workers. The experience of a field team headed by one of us (CLW) will illustrate this point. The team conducted field trials of the attenuated E strain typhus vaccine and doxycycline chemotherapy in Burundi in 1969. Since the team members were in frequent, close contact with louse-infested typhus patients, there were many opportunities for them to become infested with human body lice. Matters were complicated by the fact that the local lice were resistant to malathion as well as DDT (2).

It was found that clothing was disinfested of various ectoparasites when placed overnight in a duffle bag with a plastic strip impregnated with dichlorvos (No-Pest Strip, Shell Chemical Co.), and the fact that the team members remained free of lice was attributed in part to the effectiveness of this measure. Brief tests of the action of dichlorvos against a rabbit-adapted strain of Pediculus humanus humanus L. were conducted in the laboratory to test this assumption (1).

Lice were placed in a small (50 × 75 cm) plastic bag with a dichlorvos strip. It was found that dichlorvos vapors were lethal to nymphal and adult lice over a wide range of temperature (4° to 32°C). Lice exposed to dichlorvos at 24°C for as little as five minutes died within 24 hours. To simulate field conditions more closely, lice were placed in a capsule with open mesh, tightly packed in nearly 30 layers of cotton toweling, and placed in a plastic bag with a dichlorvos strip for seven hours at 24°C. At the end of their period of exposure, 44 per cent of the treated lice were dead, as compared with 2 per cent of the controls. At the end of another 17 hours, during which the lice were kept in a well-ventilated area with no further exposure to dichlorvos, the total percentage of dead lice rose to 80 in the treated group and 17 in the controls. Tests for ovicidal action revealed that a 24-hour exposure to dichlorvos was not effective against louse eggs that had been laid only a day or two before.

There is much to recommend the use of dichlorvos strips for preventing or controlling louse infestations in the field. The strips are compact, simple to use, and retain their strength for a relatively long time. The possibility that dichlorvos might also be effective against lice that have developed resistance to insecticides in common use needs to be investigated. The failure of dichlorvos to kill louse eggs indicates that the strips should be used on a regular, daily basis for maximum effectiveness.

\(^1\) Department of Microbiology, University of Maryland School of Medicine, Baltimore, Maryland, USA.
Introduction

Historically, much effort has been expended developing body lice control methods. Researchers have recommended control methods ranging from the wearing of silk underwear to the use of highly odoriferous oils (9). The search for ideal fumigants has also consumed a considerable amount of research time. Unfortunately, no ideal fumigant has ever been discovered because of the variety of control situations that exist (3).

The development of the synthetic contact insecticides provided a new tool for health workers tasked with body lice control. These chemicals made it possible to control lice on individuals, thereby reducing the threat of louse-borne diseases and eliminating the need for broad-use fumigants. We are now confronted with insecticide resistance in body lice (7, 8, 13), however. New control concepts for the abatement of louse-borne disease epidemics will be forthcoming, but it is doubtful if they will be available for several years. This may force workers to use previously developed chemicals and techniques until newer methods become available. For this reason, we have again become interested in the potential of fumigants for the control of body lice.

Discussion

The establishment of criteria to screen fumigants is a subjective process. Such factors as human toxicity, cost, odor, volatility, flash point, boiling point, effect on clothing, time required for destruction of lice and eggs, and availability are all factors that must be analyzed. Many data have been accumulated on the physical characteristics and effectiveness of fumigants (4, 5, 6). The compounds and techniques that are available are too numerous to review at this time, but the most promising ones have been included for consideration.

In theory, one of the simplest methods of control includes the use of hot air. This method, which destroys both eggs and lice, can be accomplished if the proper techniques and equipment are used (1). One limiting factor is the difficulty of organizing and moving the infested people and their clothing to a central treatment facility.

Hydrogen cyanide has been widely used for clothing and house fumigation (12, 15). HCN is dangerous to use, however, because of its poor warning properties and high mammalian toxicity. This gas can also be adsorbed and retained by fabrics. Ample airing of bedding, clothing, or structures is necessary when HCN is employed as a louse fumigant.

Methyl bromide has been shown to be very effective against lice (10, 11, 14). It does not damage or stain clothing and rapidly dissipates from the treated product. It has no odor and is not flammable. Normally,