cloudy zones was also extracted in the same way and gave X-ray diffraction patterns identical with those of the original powders. These results clearly showed that the crystal structure of the minerals had been destroyed.

D. M. WEBLEY
R. B. DUFF
W. A. MITCHELL

Macaulay Institute for Soil Research,
Craigiebuckler,
Aberdeen.

[1] Louw, H. A., and Webley, D. M., *Nature*, **182**, 1317 (1958).
[2] Duff, R. B., and Webley, D. M., *Chem. and Indust.*, 1376 (1959).
[3] Pollard, F. H., and McOmie, J. F. W., "Chromatographic Methods of Inorganic Analysis", 53 (Butterworths Scientific Publications, London, 1953).

Some Effects of Aldrin and DDT on the Soil Fauna of Arable Land

INSECTICIDES are now extensively applied to agricultural soils, and if this practice continues there is the obvious possibility that such treatments may have harmful effects on the soil fauna. The chlorinated hydrocarbons are not readily broken down in soil[1,2], and the general use of fertilizers containing aldrin could be one source of accumulations of this material in agricultural land. The applications of insecticide may control specific pests as desired, but could also suppress certain elements of the fauna, and even cause secondary increases of some soil animals by modifications in the predator pressure.

We have studied the effects of rates of insecticides commonly used, on the soil fauna of arable land, at Cannington Farm Institute, in Somerset. The rates of insecticides used were 3 cwt. of 1·25 per cent aldrin dust, and 2 cwt. of 5 per cent DDT dust per acre, and plots were laid out in a random block consisting of four replicates of each treatment and control. The size of each plot was 6 ft. square with 6 ft. guard rows between plots. The insecticides were applied to the surface of the plots as dusts and thoroughly mixed into the soil to a depth of 6 in. by double rotovation. All plots were kept fallow throughout the period of the trial by regular application of the weed-killers CMPP and 'Dalapon'.

The soil was sampled at intervals of 2–3 months after the beginning of the experiment. Samples taken from each plot consisted of (*a*) four 2-in. diameter cores to a depth of 6 in., and (*b*) twenty-five 1-in. diameter cores also 6 in. deep. The fauna was extracted from the first sets of samples by washing through a somewhat modified Salt and Hollick[3] apparatus and then stored in vials of alcohol until the animals could be sorted into taxonomic categories by examination under a binocular microscope. The second set of samples from each plot was bulked and thoroughly mixed, and the nematodes extracted from small sub-samples placed in Baerman funnels[4].

Considerable changes in population occurred in most groups of the soil fauna. Initially numbers of most groups of animals decreased because of the cultivation, but this lasted for only three months. Both insecticides significantly decreased the numbers of Acarina in the treated plots. Aldrin also brought the population of Collembola to a low level, but DDT increased numbers of these animals to a peak nine months after treatment, after which numbers fell to a level slightly above that of the untreated plots. This confirms the results obtained by Sheals[5] for soil treated with DDT and then planted with rye grass,

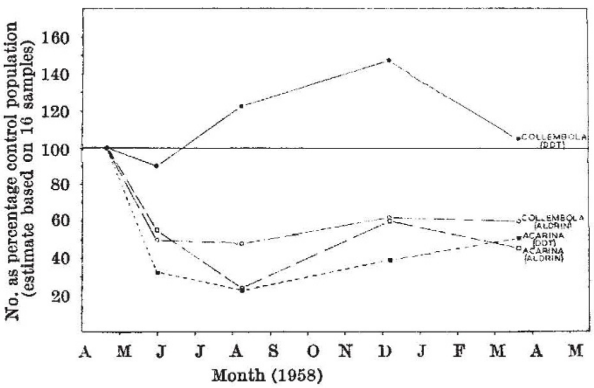

Fig. 1

and by Dobson[6], who found the Collembola population increased in arable land treated with BHC. The numbers of dipterous and coleopterous larvæ and pupæ, thrips, pauropods and symphylids were all markedly suppressed by both insecticides. Numbers of root aphids were greatly decreased by aldrin but not by DDT ; neither insecticide affected the populations of small plant parasitic nematodes, earthworms and enchytraeid worms to a significant extent.

More detailed sorting of the fauna, possibly to species-level, will be necessary to show whether the increased numbers of Collembola in the DDT-treated plots result from changes in the predator–prey balance, but quite small dosages of insecticide can obviously have considerable effects on the fauna and so might eventually influence the fertility of the land.

A full account of the results will be published shortly.

C. A. EDWARDS

Rothamsted Experimental Station,
Harpenden, Herts.

E. B. DENNIS

N.A.A.S.,
Government Buildings,
Westbury-on-Trym, Bristol.

[1] Lichtenstein, E. P., and Schulze, K. R., *J. Econ. Ent.*, **52** (1), 125 (1959).
[2] Edwards, C. A., Beck, S. D., and Lichtenstein, E. P., *J. Econ. Ent.*, **50** (5), 622 (1957).
[3] Salt, G., and Hollick, F. S. J., *Ann. App. Biol.*, **31**, 52 (1944).
[4] Staniland, L. N., *J. Helminth.*, **28** (1/2), 115 (1954).
[5] Sheals, J. G., *Bull. Ent. Res.*, **47** (4), 803 (1956).
[6] Dobson, R. M., and Lofty, J. R., Sixth Int. Congr. Soil Sci., **3**, 33 (1956).

Microbiology of Some Soils from Antarctica

ANALYSES of soil from Antarctica reveal little weathering and only minute quantities of organic matter[1]. Vegetation in this area is commonly restricted to mosses, lichens, or algae. A number of samples of moss, algae and soil from the McMurdo Sound region have been examined to determine the nature of the microflora and microfauna associated with this very simple organic cycle.

Among the genera of terrestrial algae already identified are *Chlamydomonas*, *Chlorella*, *Chlorococcum*, *Stichococcus*, *Nostoc*, *Hantzschia*, *Bumilleriopsis*, *Radiosphaera*, *Heterothrix*, *Heterococcus*, all of which are typical of soils in temperate climates[2,3]. The last-named four genera have not been previously recorded from the Antarctic continent.

The bacterial flora of the moss is similar to the epiphytic flora found in temperate climates[4,5],