

PROJECT UPDATE: ARTHROPOD FAUNA OF SOILS IN CANADA:
A CONFERENCE ON FAUNAL INFLUENCES ON SOIL STRUCTURE

Conference report (J.R. Spence)

A conference entitled "Faunal Influences on Soil Structure" was held at the University of Alberta during 10-13 June 1984. The event was jointly sponsored by the Departments of Entomology and Soil Science at the University together with the Research Management Division of Alberta Environment. Seventy-eight delegates representing laboratories in 12 countries registered for the sessions, providing a truly international flavour. The conference grew out of recent Canadian interest in the area of soil biology stimulated by activities within the Canadian Society of Soil Science and by the Biological Survey of Canada through promotion of a project on the biology of soil-dwelling arthropods. Several past and present members of the Scientific Committee for the Biological Survey were involved in organization of the conference and participated in the sessions.

The programme included formal scientific papers given by international experts invited to synthesize information of joint interest to pedologists and soil zoologists, workshops dealing with methods employed by soil micromorphologists and soil zoologists, and poster sessions promoting active discussion among participants about specific research projects. Formal papers by R.C. Foster, A.R. Mermut and S. Pawluk introduced the topic of soil micromorphology to biologists and documented the importance of animal activity in generating soil microfabrics. These speakers also made it abundantly clear that understanding soil structure is an essential part of coming to grips with fundamental soil processes affecting soil fertility and plant growth. D.K. McE. Kevan provided a wide-ranging historical overview about the history of soil zoology. D.L. Dindal, D. Parkinson and J. Rusek summarized work about ecological interactions among various soil organisms and presented stimulating suggestions about potential directions for cooperation between pedologists and soil biologists. Papers about specific groups of soil organisms were given by C.A. Edwards (earthworms), R.L. Hoffman (myriapods), R.A. Norton (arachnids), A. Fjellberg (apterygote insects) and P.J.M. Greenslade (pterygote insects). In general, these papers documented the great importance of soil animals with respect to soil processes, introduced pedologists to a fascinating suite of unsolved biological problems and stressed that much work remains to be done on the biology and systematics of soil organisms before soil ecology can flower in North America. H.J. Altemuller and S.B. Hill closed the formal sessions by discussing possible applications of research in soil biology in agriculture and forestry. The workshops are covered in detail in a companion article by V. Behan-Pelletier.

Two main concepts emerged from the conference. First, it was demonstrated that animal activity accounts for much of the observed microstructure of soils but that we know precious little about the identity or biological characteristics of the specific organisms involved for most soils. Second, enthusiastic discussions indicated the pedologists and soil zoologist have much common ground and that cooperative ventures promise large increases in understanding of soil systems. Although the active corps of North American scientists available for this sort of work is far smaller than warranted by the importance of the problems, the group is enthusiastic and those attending the conference were optimistic about prospects of further interaction.

The Proceedings of the conference will be published. Anyone not attending the conference but interested in purchasing a copy of the Proceedings should contact Dr. J. Spence, Department of Entomology, University of Alberta, Edmonton, Alberta T6G 2E3.

Conference workshops (V. Behan-Pelletier)

In addition to the excellent series of speakers on different topics in soil zoology and soil micromorphology (outlined above) and a well attended poster section, short workshops were held on Soil Micromorphology, Soil Zoology, and Frontiers in Soil Zoology.

The workshop on Soil Micromorphology, given by A. McKeague and C. Fox of Land Resource Research Institute (LRRI), Agriculture Canada, Ottawa, had as its objectives to introduce soil zoologists to the techniques used in soil micromorphology and the role soil micromorphology plays in clarifying soil forming processes and in soil classification. The workshop outlined the methods used to sample soils, the various stages in the preparation of thin sections and how these are subsequently interpreted by the soil scientist. The equipment and thin sections which were on hand gave soil zoologists an opportunity to attempt their own interpretations. In addition, many items were available for distribution, including an annotated reference list to major works in soil micromorphology, a procedure for sampling soil for micromorphology, and sections on methodology from a Manual, edited by B.H. Sheldrick, LRRI, to be published later in 1984.

To complement this workshop, A.D. Tomlin, Agriculture Canada, London, V. Behan-Pelletier, Biosystematics Research Institute, Ottawa, and S.B. Hill, Macdonald College, McGill University, gave a workshop on Sampling, Extraction, Handling and Identification of Soil Invertebrates. Its objectives were to introduce soil micromorphologists to the variables in soil invertebrate distribution which affect the experimental design and sampling procedure; to outline the major methods of extracting soil invertebrates; and to illustrate the different groups of soil invertebrates and the specific handling techniques required by each group. The many materials available included short annotated bibliographies on statistics, experimental design and sampling techniques; extraction techniques; major references on soil invertebrates, including a section on Collembola by A. Fjellberg, Norway; a guide to handling techniques for the different groups; identification sheets for the major groups, and a pre-publication look at the 'Key to Orders of insect larvae, wingless adult insects, major groups of terrestrial and freshwater arthropoda, exclusive of plankton, and selected other invertebrates of America north of Mexico', by S.B. Hill et al., to be published later in 1984. Included in the materials available at this workshop were items from R.A. Norton, S.U.N.Y., Syracuse, on: 'A variation of the Merchant-Crossley soil microarthropod extractor'; 'A method for making superior micro-needles'; and an annotated list of introductory literature on arachnids. In addition, the many groups of soil invertebrates on display gave soil micromorphologists a hands-on opportunity to see the dimensions and morphology of these animals.

In all three workshops the interaction between workshop leaders and other specialists was a key factor in their success; participants were exposed to both the expertise of the scientists giving the workshop and the suggestions and modifications of other experts in the discipline. This fostered the exchange of ideas between soil zoologists and micromorphologists, which was an objective of the whole conference.