BOOK REVIEWS

Rothamsted Experimental Station Annual Report for 1983, (Published by Rothamsted Experimental Station, Harpenden, Herts, ALS 2JQ, UK) 1984, p. 354. Price: £10.00

The report is in two parts of 354 pages. Part I of 221 pages gives the divisional reports and soil survey of England and Wales and Part II, 225–352 pp contains Rothamsted report for garden clover grown since 1954, yields, crop and soil analyses for the period 1956–1982, observations on stem nematode *Ditylenchus dipsaci* attacking field beans, *Vicia faba;* synoptic monitoring for migrant insect pests in Great Britain and Western Europe; use of fertilizers in England and Wales and Rothamsted Insect survey, 15th annual summary.

It is now felt that nutrient concentration in arable crops estimated on the basis of tissue water may give a more reliable indication of nutrient uptake than as percentage of dry matter. With K in Barley a concentration in tissue water of about 100 mM is maintained during most phases of growth provided adequate K-nutrition is available and so, this level may become the basis of a diagnostic tissue test for possible K deficiency.

Aphids form the single most damaging group of insects affecting crops and considerable data has been gathered over twenty years. Now the information will be augmented with the aid of "vertical looking" radar which will enable radar signals to detect even small aphids at heights upto 500 m. The equipment now commissioned monitors aphids in two tiers (20–100 and 100–500 m) and provides information on the weight, shape, speed, flight direction, wing beat frequency of individual insects to enable identification, and the information will be analysed immediately by a dedicated computer.

The extent of virus infection is likely to be reduced if aphids can be dissuaded from settling on foliage or if their movement between plants is restricted or in the case of persistent viruses, the time spent by the aphids feeding on individual plants is shortened. Work is in progress on aphid alarm pheromone (E)-β-farnesene and derivatives. Another common plant product, the sesquiterpene (-)-β-Caryophyllene has been identified for the first time as an inhibitor of pheromone communication in aphids being capable of antagonising about 30 times its own concentration of (E)-β-farnesene.

Work on electrostatic spraying is being continued. As part of the research on plant cell biology, T-DNA from *Agrobacterium tumefaciens* and *A. rhizogenes* has been introduced into cells of commercial tetraploid potato varieties. Transformed plants have been regenerated from cell cultures, containing bacterial DNA and these have formed tubers and a second generation of plant has already sprouted from one of the tubers. The achievement is particularly significant as it is likely to lead to Co-introduction with T-DNA of modified or unmodified genes and the opportunity to investigate what factors influence their stability of expression in transformed plants.

The development of techniques for the mass culture of earthworms eventually may lower pollution caused by organic farm wastes. The mass culture development at Rothamsted since 1980 has now been adopted for commercial exploitation by the British Earthworm Technology.

This Report is valuable to all institutions engaged in Agricultural Research.

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Annual Review of Earth and Planetary Sciences edited by G. W. Wetherill, A. L. Albee and F. G. Stehli (Published by Annual Reviews Inc. Palo Alto, California 94306, USA) Vol. 12, 1984, pp. 518, Price USA $ 44-00; Elsewhere $ 47-00.

The series of Annual Review of Earth and Planetary Sciences which started appearing from 1973 onwards have served an admirable purpose and the issue of each volume is looked forward with growing interest. The present volume, the twelfth in the series, does not fall short of these expectations. It contains many reviews of particular interest to Earth Scientists in India.

The first article is generally planned to be autobiographical in character. In the present volume this honour has gone to L. L. Sloss who has reviewed developments in stratigraphy during the fifty year

period commencing from 1933. Developments in quantitative facies mapping, the quantitative expression of geological facts and features as traced by Sloss makes fascinating reading. The developments in stratigraphic observation emerging from the digital recording of multi-channel exploration-seismic data during the 1960s and through the 1970s are particularly significant. We are told that the stratigraphic geometry of unconformities (truncation, overstep, onlap etc.) is exposed to observation and analysis in almost embarrassing profusion leading to the identification of many regionally significant packages. More than this, the near global coverage provided by multinational exploration efforts has helped in tracing unconformities from region to region and from continent to continent. The greatest volume of seismic data is shown to have demonstrated global synchrony of stratigraphic patterns. The importance of study of sedimentary basins in understanding the tectonic evolution of cratons is emphasized.

Developments in the application of accelarator mass spectrometry and the light it throws on research on atmosphere, cosmic-ray history from arctic ice, manganese nodules, pelagic sediments, evolution of soil and erosion, dynamics of aquifers, formation of continental margins and dating of earthquakes are detailed by Louis Brown. The next few years are expected to greatly extend the application of the new technique in solving geological problems.

In another review article, 'Oceanography from space', R. H. Stewart of the Scripps Institution of Oceanography describes the instruments employed and specific measurements made from space. The growth of continents through accretion of discrete allochthonous fragments of oceanic and continental material at active margins are described.

Pasteris reviews work on kimberlites and the physical and chemical conditions accompanying mantle melting. Another review article 'Sedimentation in large lakes' focusses attention on the importance of study of lake sediments as palaeoclimatic records and as basis in which to test models of aquatic sedimentary processes. Review of Pre-Quaternary sea-level changes focusses attention of global synchronous events which affect sea-level, particularly variations in ridge volume which affect the capacity of ocean basins. 'Rates of evolution' and the notion of 'Living Fossils' is the title of another review article in which Schopf reviews the main results of molecular biology having a bearing on rates of evolution.

Magneto stratigraphy and correlation of mammal fauna and development of biochronologic ordering of first or last occurrences of faunal events are described in another review article of special significance to palaeontologists.

The last of the review article is on 'Structure and tectonics of the Himalaya' by Peter Molnar. The article is mainly concerned with geophysical aspects, concentrating on large scale structure and tectonics in which geophysical data offer strong constraints. A large number of facts, geological and geophysical, have been marshalled and the review does help in gaining an improved understanding of the evolution of Himalaya.

This necessarily brief summary of contents in the volume under review will serve to give an idea of the rich store of information provided. The reviews are authoritative and of high quality. They are sure to stimulate a wide variety of readers. The acquisition of the book is a must for all libraries handling Earth Science literature.

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