MINERAL RESOURCES

New Prospects

from a Correspondent

TYNAGH, Gortdrum and Silvermines are household words in metal mining today. All are mines in the Republic of Ireland which have been brought into production within the past decade and are likely to be followed by others in the near future. Great Britain can point to a major new tin development, the Wheal Jane mine in Cornwall, and hopes are high for potash, copper and nickel elsewhere in the country. Both Ireland and Britain are being explored for metalliferous minerals on a scale and in ways never seen before. Their geologists and mining engineers came together in Edinburgh on September 10 to describe the new findings and the methods of exploration at a symposium arranged by the Institution of Mining and Metallurgy as one of a group of earth science meetings held to celebrate the centenary of the University of Edinburgh Geology Department.

With so much ore already proved, the geologists working in Ireland inevitably had much to say. Dr R. W. Schultz (Northgate Exploration Ltd, Dublin) gave high marks to geochemical soil and drainage surveys in his analysis of exploration practice. Although reserving judgment on the origin of mineralization in the Lower Carboniferous of central Ireland, Dr C. J. Morrissey (Irish Base Metals Ltd, Dublin), Professor G. R. Davis (Imperial College, London) and Mr G. M. Steed (Imperial College, London) made a lucid comparison of the characteristics of these valuable lead, zinc and copper deposits. In England, the Carboniferous is receiving most attention for fluorite, and Dr T. D. Ford (University of Leicester) and Dr P. R. Ineson's (University of Sheffield) comprehensive account of the Derbyshire orefield will simplify the task of future exploration in that area. The Lower Palaeozoic rocks of Wales, eastern Ireland, the Lake District and southern Scotland together form a major exploration target and the recognition by Mr C. J. V. Wheatley (Imperial College) of an axial belt of copper deposits associated with acid volcanic rocks and bordered by lead–zinc mineralization provides a highly stimulating basis for considering the controls of metallization within them.

The rapid re-development of the Wheal Jane mine into a major tin producer has surprised many people. There is clearly more mineral wealth in Cornwall than is contained in narrow tin lodes and the account of the structural environment of the deposit by Mr B. D. Rayment (Consolidated Gold Fields Ltd, London), Professor G. R. Davis and Mr J. D. Willson (Consolidated Gold Fields Ltd) will help to stimulate further exploration in south-west England. In the Scottish Highlands, reconnaissance investigations by the Institute of Geological Sciences have revealed new evidence of uranium, lead and molybdenum in the Old Red Sandstone sediments and Caledonian granites.

ENTOMOLOGY

Insect/Plant Relations

from a Correspondent

IN contrast to other recent contributions to the subject of insect/plant relations, the symposium held in London on September 16 and 17 by the Royal Entomological Society covered the field in breadth in a way which made it possible to appreciate the overall relevance and interrelations of disciplines ranging from biochemistry to ecology.

In introducing the symposium, Professor T. R. E. Southwood (Imperial College, London) considered relationships in terms of shelter, food and transport. He mentioned in particular the evolutionary hurdle which is seemingly presented by seed plants as food, because in spite of the great abundance of these plants they have been exploited by relatively few insect taxa. Within these taxa, however, the insect/plant systems have co-evolved from predation by the insect on the plant through parasitism to symbiosis.

Biochemical relationships were well exemplified by Dr D. Osborne's (ARC Unit of Developmental Botany, Cambridge) contribution on mutual regulation of growth and development. Secondary substances in the plant may thus control development of the insect or even be needed to induce the female to emit its sex pheromone. Conversely, the insect may affect plant growth, not only by causing malformations but also by stimulating or delaying normal processes of leaf growth and senescence.

The Hon. Miriam Rothschild (Elsfield Manor, Oxford) discussed her work on warningly coloured insect species which sequester and store toxic substance from plants. This was a fascinating account of mechanisms which underlie forms of mimicry defined a century ago but, until now, inadequately examined biochemically. Miss Rothschild described how some tiger moths select only those host plants which retain certain alkaloids toxic to bird and mammal predators; the processes involved in such selectivity were examined by several other speakers. Dr L. M. Schoonhoven (Laboratorium voor Entomologie, Wageningen) described the chemoreceptors of a lepidopterous larva, which respond separately to a wide range of nutritional and secondary plant substances. He suggested that the basis for host plant specificity is more than mere recognition of particular plant substances and is dependent on the insect's ability to recognize the complex of many different substances associated with its own host plant and its nutritional requirements. Professor D. L. Wood (University of California, Berkeley) also described his research on

New Polynucleotide Structures?

BRAM has recently reported some unexpected findings on the dependence of DNA structure in solution on the base composition, and in next Wednesday's *Nature New Biology* he gives results of X-ray scattering studies on a set of two-stranded synthetic polynucleotides in solution. Leaving aside large differences in hydration or binding of counterions, differences in the low angle X-ray scattering envelopes from polynucleotides in solution should mean that they have differences in structure. The double-helical complex, poly dI.poly dC, shows a wide-angle scattering pattern which is different from that of A or B-form DNA. The axial radius of gyration, as derived from low-angle scattering, seems to be larger than that of B DNA and is interpreted to signify that the centre of gravity of the base pairs lies off the helix axis. The same is also found in poly dG.poly dC.

For the alternating double-helical polymer, poly d (I-C) the axial radius of gyration is similar to that of DNA and the alternating poly d (A-T). The corresponding helix cross-section agrees with that found in fibres. Bram finds, however, that the wide angle scattering patterns of both this polymer and of poly G.poly C are different from any others found in polynucleotides or natural nucleic acid.

The double-stranded RNA analogue, poly rI.poly rC, gives scattering patterns which are compatible with the A-DNA-like structure (A′-form) of this polymer, found in fibres. Bram regards this agreement as support for the validity of experiment and the theoretical analysis. The generalization with the data so far available is that in double-stranded polynucleotides with purines and pyrimidines on opposite strands, the radius of gyration is larger than in alternating polymers, and the base pairs lie off the helix axis. Altogether Bram now identifies six different structures for DNA-type molecules. He suggests that the unique configuration of the poly G. poly C raises the possibility that parts of a natural DNA rich in these nucleotides could have a different structure from the rest of the chain.