

the environment in which he now lives. But, although man is good at designing machines, he is not so good at understanding human behaviour, and the introduction of electronic machines could have lamentable social consequences if the personal problems involved are neglected. Many people are bound to be affected personally. Considerable changes of technique cannot be brought about overnight. The period of

adjustment is long enough to give those in authority the opportunity of using the means at their disposal, such as retraining schemes and the adaptation of recruitment and wastage-rates, to anticipate consequences and work out the necessary human measures to meet new circumstances. Good personnel management must accompany a developing technology.

T. H. HAWKINS

EPIDEMIOLOGY OF BLACK RUST OF WHEAT

A SYMPOSIUM on "Epidemics of Black (Stem) Rust of Wheat" was held in the afternoon of October 7 under the auspices of the British Mycological Society. Mr. L. Ogilvie (National Agricultural Advisory Service, Bristol) said that the alternate host of black rust, wild barberry, does not appear to be implicated in the origin of uniformly distributed and almost simultaneous epidemics in the south-west of England. It was therefore decided to find whether uredospores are transported from the Continent in the same way as they are carried northwards from Texas into the American wheat belt.

Collaborative investigations which have been proceeding in Western Europe and North Africa since 1958 show that the disease overwinters in the uredospore stage on wheat and grasses in North Africa and Southern Iberia, and spreads northwards in summer. Observations on field crops and on some thirty widely scattered 'rust nurseries' (small plots of varieties of spring wheats) were organized from Bristol. About a fortnight after uredospores were trapped in quantity, rust was found in the fields and from then on became common in most of the southern coastal areas, the Channel Islands and Isles of Scilly and, later, to a lesser degree, in the whole of the southern half of England.

Dr. I. G. Thorpe (National Agricultural Advisory Service, Bristol) stated that the oat, barley, and some grass varieties of *Puccinia graminis* are not uncommon on barberries in England, but the wheat variety has not been found in recent years. The simultaneous appearance of the disease over a large area suggests a widespread inoculum. Uredospore deposits on spore traps can usually be correlated with air trajectories from countries to the south, as is explained later. Up to the present, the spectrum of rust races recognized

in England greatly resembles that of the Iberian Peninsula and France. Mr. H. A. Hyde and Mrs. K. F. Adams (National Museum of Wales, Cardiff) reported that black rust uredospores have been found from May onwards in the spore catches organized by the Asthma and Allergy Research Unit at Cardiff and the Bishop Rock Lighthouse, often before wheat is affected in England. Simultaneous catches of black rust spores have often been made at points more than 150 miles apart. The theory of spore clouds originating from the Continent is supported also by catches in spring of pine pollen, which apparently came from southern Europe.

Mr. W. H. Hogg (Meteorological Office, Bristol) described how air trajectories could be prepared from weather maps, and gave estimates of the errors involved. Uredospore catches in London during the period July 4-10, 1959, were accompanied by air trajectories from the Continent. When the air came from other quarters, spores were few or lacking. Dr. J. M. Hirst (Rothamsted) dealt with theories underlying the liberation, transport and deposition of rust uredospores. Sampling from aircraft traversing southerly airstreams over the English Channel have shown large numbers of spores at heights up to 7,000 ft.

Conclusions which may be drawn from the symposium are that a severe black rust epidemic in England depends on susceptible varieties of wheat (all varieties grown here are susceptible to the common West European races of black rust), lateness of the wheat crops, transport of spore clouds arising from epidemics to the south by one or more favourable wind trajectories in late June or early July, and warm and humid weather at the time of infection and for several weeks later.

TROPICAL ECOLOGY

ECOLOGICAL terminology and concepts applicable to, and developed under, temperate conditions sometimes have little relevance to the vegetation of the tropics, and a journal devoted especially to tropical ecology will be welcomed by many as meeting a real need, so long as it does not encourage ecologists in differing climatic zones to overlook the essential unity of their subject.

Nos. 1 and 2 of Vol. 1 of the *Bulletin of the International Society for Tropical Ecology* give little indication of the extent to which this new journal will, in fact, meet the need which undoubtedly exists. No. 1 contains a presidential address: "Why Tropical Ecology?" by J. C. Sen Gupta, as well as abstracts

of 22 papers, mainly on tropical forests, given at a symposium on forest ecology held at Bombay. In No. 2 are rather longer accounts of 21 papers read at a forest ecosystem symposium which was a part of the ninth International Botanical Congress held at Montreal. There is thus an absence of research papers of the conventional type; but it is useful to have the views of experts from many countries on forest classification assembled together in a single volume in this way.

No indication is given as to whether succeeding numbers of this journal will be restricted to abstracts of papers read at symposia and conferences, or whether the journal is to restrict itself to tropical