vegetation types in the islands. There are three basic zones of vegetation. The littoral zone has a high rate of plant immigration, but also a high rate of extinction. Here there are few endemic species. Lowland areas, which are particularly extensive in the Galapagos and are arid, are rich in endemics. Elevated areas have a moister climate and a low proportion of endemic species. Because the larger islands are also those which possess the regions of greatest altitude, it is to be expected that island areas will be negatively correlated with the proportion of endemics in the flora.

The reason for the frequency of endemics in the arid zone and their scarcity in the moist uplands is probably to be found in the climatic history of the Galapagos Islands. Colinvaux has found (*Nature*, **240**, 17; 1972) that the wet climate of the uplands dates back only 10,000 years. Arid climates, however, have existed on the Galapagos for at least 34,000 years and probably for much longer than this. Long established taxa are therefore liable to be adapted to arid conditions.

Some species of the moist, elevated areas, however, are endemic, for example, the tree *Scalesia pedunculata* and the shrub *Miconia robinsoniana*. Concern about the future of plants such as these on the Galapagos is expressed by E. K. Schofield (*Biol. Conserv.*, **5**, 48; 1973). Because the uplands receive most of the available rainfall, it is these areas which are subjected to the most intensive cultivation by the 3,000 human occupants of the islands. Not only does this involve the physical clearance of natural vegetation, but it has also resulted in the spread of exotic species introduced by man. Many of these exotics, such as *Phlox* and *Ricinus*, seem to be spreading from the disturbed areas into the natural plant communities. It is widely recognized that island faunas are particularly sensitive to the introduction of non-native species and undoubtedly the same is true of plants, though this is less well documented. It is to be hoped that an adequate conservation policy will be introduced into the Galapagos before irreparable harm ensues and the extinction of endemic plant species results.

PESTICIDES

Atmospheric Distribution

from a Correspondent

THE factors which affect the distribution of pesticides throughout the atmosphere were discussed by members of the Physicochemical and Biophysical Panel and the Pesticides Group of the Society of Chemical Industry at a symposium held on March 6 at the society's rooms in London.

Dr R. A. E. Galley (Chairman of the

Pesticides Group) reviewed the factors which cause pesticides to enter the atmosphere. Vaporization can occur from falling spray particles and from plant, water and soil surfaces. Transport by winds can occur over very large distances and the vapours can be deposited onto the Earth's surface in rain water. Although the concentrations of organochlorine particles in air or rain water are usually between 1 and 20 parts in 10^{12} the first mile of the atmosphere could contain up to 8,000 tons of these pesticides.

Dr C. A. Edwards (Rothamsted Experimental Station, Harpenden) considered that the high rates of loss of pesticides from soils often observed soon after application might be explained by volatilization. He said that this process had received relatively little consideration in the past but there are signs that it is beginning to receive more attention now. Dr F. T. Philips (Rothamsted Experimental Station, Harpenden) described his work on the volatilization of pesticides from glass and plant surfaces, from which it was clear that the interaction of adsorption, wind speed, crystal size and temperature is very complex.

Dr D. A. M. Watkins (Long Ashton Research Station, Bristol) discussed the implication of the vapour phase photochemical decomposition of pesticides. It is known that many pesticides are decomposed by short wavelength radiation and it was pointed out that although the spectrum of radiant energy which reaches the Earth's surface is very narrow, photochemical reactions could play an important part in degrading pesticides which had diffused to the upper atmosphere.

The global transport of pesticides by birds was the theme of the talk by Dr P. R. Evans (University of Durham). A recent estimate suggests that 5,000 million song birds migrate from Europe and Siberia to Africa south of the Sahara each year. About 1,500 million die in Africa, thereby depositing pesticide residues which originated in northern latitudes. Calculations show that 7–11 kg of DDT is transported in this way each year.

Professor R. S. Scorer (Imperial College, London) suggested that the current philosophy of spraying crops to protect them from insect pests is highly inefficient and analogous to spraying human beings to protect them from malaria. He said that pests must be controlled on a regional international basis and that this would enable meteorologically-induced macro swarms to be tracked down and attacked. Much more biological knowledge of the life cycle of insects is required and this has to be related to a whole range of scientific disciplines. This contribution aroused a great deal of controversy but its concepts were well supported by radar photographs which showed that very many species of insect do in fact occur in large numbers in the atmosphere.

Further support for Professor Scorer's suggestion came from Dr R. C. Rainey (Centre for Overseas Pest Research) who described the way in which meteorological conditions have been used to enhance the distribution of pesticides when applied by ultra low volume techniques. He quoted the highly efficient controls of desert locust and African army worm that have been obtained by the use of dieldrin.

Induced Replication of Satellite DNA

WHEN mouse cells in culture replicate their DNA prior to mitosis, the satellite DNA fraction of the cell genome, which is defined by its comparatively simple base sequence, is replicated late in the S phase of the cell cycle after the bulk of the non-repetitive DNA has replicated. It is not surprising therefore that considerable interest was aroused in 1970 by Smith, who reported that when baby mouse kidney cells are infected by polyoma virus, satellite DNA replicates early in the S phase before the remainder of the DNA.

This observation by Smith seemed to indicate that polyoma virus somehow alters the sequence in which different fractions of the cell genome are replicated, an observation with many implications for models of DNA replication in mammalian cells. Unfortunately, however, as Hatfield and Walker report in *Nature New Biology* next Wednesday

(April 4), Smith's results are not "readily reproducible".

Hatfield and Walker, as a preliminary to further investigating this phenomenon, decided to repeat Smith's experiments keeping conditions as close as possible to those he used. They obtained polyoma virus from Smith, for example, and then used it to infect confluent cultures of non-dividing baby mouse kidney cells. Infection resulted in a stimulation of cell DNA synthesis, but in eleven experiments Hatfield and Walker failed to detect preferential early replication of light satellite DNA.

There seems to be no satisfactory way of reconciling Smith's results with those of Hatfield and Walker, and the latter group is forced to the conclusion that the time of replication of satellite DNA in these mouse cells, stimulated to divide by being infected by polyoma virus or by being exposed to serum, is similar.