

It should be possible to interpret the impact of the neolithic farmers on the environment when Dr J. Evans, of the Institute of Archaeology, has completed his analysis of the pollen and snail shells recovered from the site and deduced the pattern of vegetational changes. He already has evidence of a change from closed woodland to an open grassland environment, but the crucial question of when this occurred is not yet answered.

#### SYSTEMATICS

## Darwin and Domestication

from a Correspondent

CHARLES DARWIN always regarded *The Origin of Species* as a prematurely published abstract of his evolutionary ideas. In 1868 there appeared "Variation of Animals and Plants under Domestication", the first and as it transpired the only part of a projected three-volume account of the evidence that supported his theories. The Systematics Association marked the centenary of publication in English by a conference held on December 6 in the British Museum (Natural History), London. As the chairman, Professor J. G. Hawkes (Birmingham), indicated, the meeting sought first to pay homage to the man and the book, second, to examine the ways in which our knowledge has increased in the past 100 years and, third, to consider where the next advances are likely to be made.

Professor A. J. Cain (Liverpool), in his introductory lecture on the book itself, placed strikingly in context what appears at first sight to be one of its oddities, the two chapters devoted exclusively to the domestic pigeon. Darwin realized that for natural selection to be a tenable theory, he had to demonstrate within-species variation on a scale vastly greater than most of his contemporaries could envisage. The domestic pigeon with all its bizarre variety, yet unquestionably derived from one wild species, the rock dove, provided just the evidence of variability that he needed.

In their reviews of the progress in our knowledge, both Dr I. L. Mason (Edinburgh), dealing with farm animals, and Dr J. P. Cooper (Aberystwyth), discussing forage grasses, emphasized the enormous range of variability that can be revealed by selection, both natural and artificial.

Dr Mason illustrated the almost inextricably intermingled diversity of sheep and goats with breeds of both in different parts of the world selected for wool, meat or milk production or any combination thereof or even just for fashion. The biblical treatment (*Matthew*, 23: 32) is still, however, possible: a goat's tail always turns up! Dr Cooper's ryegrass experiments also showed that there is a great deal of variation and that it can be selected for in just the way that Darwin outlined. For example, after six generations of disruptive selection two quite different races had been produced which would not only be intersterile in nature but which possessed as much variance as the original population.

Dr W. T. Stearn (London) and Professor F. Schwanitz (Aachen) both discussed aspects of our understanding of the evolution of cultivated plants which were unknown to Darwin. These include hybridization, particularly in association with polyploidy, "point"

chromosomal variability. The last of these particularly and chromosomal mutation, heterosis and extra-interested Professor Schwanitz, who outlined work in which "improvement" (in terms of greater fertility) in individuals of various plant cultigens took place from year to year in cultivation. While superficially resembling inheritance of environmental response he was at pains to interpret this, not in terms of strict Lysenkoism but through the selection of extra-chromosomal factors (DNA-containing structures).

What of the future? Dr Keith Jones (Kew) pointed out that, except as to speed and direction, evolutionary processes under domestication are the same as those in the wild and emphasized that our knowledge of DNA function and replication showed that the amount of natural variation possible was almost unlimited. It may be that as our knowledge of the molecular basis of variation becomes more extensive, we will be able to answer Professor Schwanitz's challenge to enhance our knowledge of the variation of domesticated animals and cultivated plants in ways that can help in the struggle against world hunger.

#### BOTANY

## Old Plants, New Discoveries

from a Correspondent

PROGRESS in the knowledge of plant life of the past depends on two factors—the development of new methods, and the discovery of new material. Encouraging news of activity in both fields was given to a meeting held at the University of Reading on December 13, to commemorate the retirement this year of Professor T. M. Harris. The meeting, attended by seventy British and foreign palaeobotanists, was organized by the Linnean Society, and was the second meeting of that body to be held outside London.

The interpretation of Tertiary assemblages of fossil angiosperm leaves is complicated by the possibility of selective factors in events leading to fossilization. Mr David Ferguson (Utrecht) reported on experiments with various types of living leaves, rotated in drums with a water-sand suspension. It appears that there is much less difference in the survival rate of tougher, zeromorphic leaves against softer, mesic ones than is generally supposed. A fossil leaf assemblage is unlikely to be ecologically biased in this respect. Resistance of leaves to attrition during transport further shows that they may represent vegetation from sources up to a hundred miles away from the site of deposition. Ferguson has applied this work to the German late Tertiary flora of Kreuzau, which he interprets as having strong affinity with the present-day flora of Southern China. Mr M. Boulter (London) reported on a new locality for British Late Tertiary plants. His work on the clays in the sink-hole deposits of southern Derbyshire has revealed a conifer-rich assemblage of leaves, seeds, cones, wood and pollen including remains of *Pinus*, *Picea*, *Abies*, *Tsuga*, *Cryptomeria* and *Sciadopitys*. This assemblage is of particular interest in representing one of the very few late Tertiary floras known in the British Isles, and possibly the only one of Pliocene age.

Interesting new evidence is emerging of the evolutionary progression from free-sporing heterosporous pteridophytes to the seed. Work by Dr John Pettitt