

Misgivings about the implications of psychology on the part of humanists and others concerned with values seem to depend upon two assumptions: (1) that science is an attempt to supersede ordinary thinking rather than supplement it; and (2) that in setting out to establish a science of human behaviour the psychologist is somehow claiming that human beings are predictable in the way that atoms or billiard balls are predictable. In point of fact, neither of these assumptions seems to be justified. The former is a result of over-simplification, and arises from a belief that in any situation there is always some one statement or theory which is 'really true', all others being partial or false. But even within science this does not hold.

The scientist describes as accurately as he can certain features of the world around him, and then devises systems or models through which the economy of inference replaces the laborious cataloguing of facts; that is to say, he invents a way of talking or thinking which is very useful for certain purposes, among them prediction and control. But this is not to say that he discovers what things 'really' are. My neighbour is really my neighbour just as he is really *Homo sapiens*, and really hydrocarbons, water, and some trace elements. The emergence of a science of behaviour does not seem to alter this situation in any important way, and it is a situation which has existed since science began.

The second assumption arises from the widely held view that science is mainly concerned with causes; but this is not the primary concern of science. The search for causes is a diagnostic enterprise carried on by the practical man—the medical practitioner, for example, or the engineer—rather than the physiologist or physicist. When we talk about the cause of anything we generally mean some particular item in its history without which it would have turned out differently. More especially it is an item which we can control or change, since every event has a multitude of causal ancestors. The reliable identification of this kind of item is clearly necessary for control over our environments, and science by clarifying the structure of events makes it much easier; but science itself need not talk about causes at all. All that we need assume when we embark upon a science of behaviour is that the object of our study makes some kind of sense, or in other words, is not merely random. This is an assumption which the humanist no doubt shares.

Perhaps the real reason for some of the contemporary uneasiness is that with the abdication of philosophy, which has become a specialism among specialisms, the ordinary man is tending to turn to the scientist, and perhaps particularly to the psychologist and psychiatrist, for answers to quite general questions. It may be that some are too ready to give him what he wants; but the real solution seems to lie in a bolder and more positive approach on the part of those who at present seem to have nothing to offer us between the rigours of logical analysis and a sort of nostalgic antiquarianism.

## QUATERNARY HISTORY AND THE BRITISH FLORA

IN his presidential address to Section K (Botany), Dr. H. Godwin points out that in so far as time is required for the processes by which plants and

animals attain their distribution areas, so far the problems of biogeography must be historical problems.

Investigation of the Quaternary Period, and especially that part of it which includes the latest glaciation, the succeeding 'Late-glacial' period, and the Post-glacial period, has been applied with great effect to the study of plant geography in the British Isles. In the first place, it has enabled us to reconstruct former climates and geographical conditions during those phases of plant migration, expansion and reduction which gave rise to present ranges of area; and in the second place it has given us a chronological scale against which a great number of sub-fossil plant remains have been effectively dated, sometimes in years, sometimes by reference to a defined period of climate, vegetation, archaeological culture or of geological events. Important techniques serving these purposes are pollen analysis and radiocarbon dating, the former serving at once to give a chronological scale and to provide direct evidence of the former range of certain plants. For the purposes of his address Dr. Godwin considers the data thus acquired for a few species only.

It has been strongly urged by many botanists that the rich collection of arctic-alpine plants now found in such mountain areas as Ben Lawers, Ben Bulbin, Teesdale and Cwm Idwal are so localized because they were nunatak refugia during the glaciations. The dated records for such species as *Thalictrum alpinum*, *Dryas octopetala*, *Salix herbacea*, *Betula nana* and *Polemonium coeruleum* dispose effectively of this hypothesis, for they prove that these species were widely present in the lowlands of Britain in the Late-glacial period after the ice had vanished. Their restriction of range is a Post-glacial phenomenon associated, it may be guessed, with expansion of continuous deciduous forest, with increasing temperatures, with soil deterioration and with blanket-bog formation on high mountain areas. The records likewise prove the extinction during this period of certain plants present in the Late-glacial, so that their absence (as of *Betula nana* from Ireland) is due to extinction and not failure of migration to these shores.

Abundant evidence is forthcoming that a large part of the population of weeds and ruderal plants in Britain was naturally present also in the Late-glacial period, and that after suppression in the closed forest period they began re-expansion when prehistoric agriculture opened the woodland cover.

Likewise the records give evidence for the expansion of thermophilous plants (such as *Najas marina*) in the middle Post-glacial period, and retraction after the climatic optimum.

The methods of Quaternary research allow us to date the formation of the North Sea to a period about 8,000 years ago, and to prove that there was a long period of temperate climate and open vegetation before this, and during which dry-land immigration of plants and animals from the Continent of Europe was possible. Not only so, but the records strongly indicate that the bulk of the British flora was indeed present during this time, and that subsequent overseas immigration has been relatively unimportant until recent historic time.

Such studies as these give a new and firm basis for the study of biogeography of all those temperate regions affected by the Quaternary glaciations.