

ON the premise that the climate has changed in the past and thus may well change in the future a Government 'think tank' — the Interdepartmental Group on Climatology — was set up to 'consider whether the United Kingdom was putting sufficient effort into studying the climate'. This group, under the chairmanship of Sir Kenneth Berrill has just delivered its first report*.

The review of the present state of knowledge on climatic change (with special reference to the United Kingdom) is clear, succinct and realistic, but restricted to short-term changes. Major emphasis is given to the carbon dioxide issue (fossil fuel burning and deforestation leading to increased atmospheric carbon dioxide leading to possible global warming), and interesting estimates are given of the economic effects of a 1°C warming (a saving of £250 million per year through reduced energy demand), and the cost of a single severe winter (in excess of £80 million). This section ends with the rather optimistic statement that "within a few years sufficient progress will be made" in predicting the effects of global climatic change on the United Kingdom that climate trends will be able to be considered in future Government planning. This statement implies an understanding of the causes of natural and anthropogenic climatic change which we do not have at present, and would be viewed with scepticism in some circles.

As a review of the present state of knowledge, the Report is deficient in its neglect of studies of climatic change which are based on historical or proxy

Climatic change

from T.M.L. Wigley

data. This is disappointing since a number of world authorities in these areas are British, and British scientists have been involved in some important recent works. For example, the verification that orbital changes have a major controlling role in determining the cycle of ice ages (Hayes *et al.*, *Science* 194, 1121; 1976) is believed by many to be the major work on climatic change this decade. It might be argued that long-term climatic change (the topic of the Hays *et al.*, paper) was not of any immediate relevance. However, analysis of the past few hundred thousand years has revealed evidence that very rapid climatic changes have occurred in the past (see, for example, Hollin *Nature* 283, 629, 1980). Such changes, if they occurred today, would undoubtedly have a dramatic impact on society. The Report's emphasis on the instrumental record and computer modelling tends to reflect the work on climatic change which is being conducted in the U.K. Meteorological Office. As such it creates an unbalanced impression of work in progress in the U.K. as a whole. This impression is reinforced by the summary of research funding. Only £1 million per year is expended directly in support of research on climatic change: divided into studies of past climates (£¼ million per year) and climate modelling (£¾ million per year). From other figures quoted in the Report, it is apparent that the bulk of this expenditure is within the Meteorological Office. But how good are these estimates and how well do they reflect the work on climatic change which

is being carried out in the United Kingdom?

If one were to consider all research into past climates which is being conducted in the United Kingdom, then the figure of £¼ million per year would be an underestimate. However, a significant amount of funding in this area comes from outside the U.K., and it seems that the Report has considered only U.K.-funded research. Since this restriction has not been stated, the figures tend to be misleading — and a more complete analysis would be of great interest. But how can one properly review all U.K. research into the many facets of climatic change? Funding figures can be deceptive, even if correctly assessed, since certain items of research (such as climate modelling) are extremely expensive. How many scientists are working in the area, how much material is published, and how are these figures distributed amongst the various government bodies, the universities and private industry? These are important questions which the Group has not yet considered.

It is a pity that this Report is restricted to a review of research within, or funded by, the Government. By so doing, a considerable amount of research which is important in the study of climatic change has been neglected. Unfortunately, except in the title no statement is made of the restricted nature of the Report, and, because of this, it can only be misleading to the uninitiated. The Interdepartmental Group on Climatology has, however, not been disbanded, and we can, perhaps, look forward to a more comprehensive review at a later stage. □

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*Climatic change. Its potential effects on the United Kingdom and the implications for research, London, Her Majesty's Stationery Office, 1980.

Sign language and spoken language

from James E. Cutting

WHAT is the nature of language? This question has taken on new vitality with our increasing recognition of a whole family of languages previously ignored by linguists, philosophers, psychologists, and neurologists. These languages are the sign languages of the world used by communities of the deaf in enclaves scattered about the globe. These languages are, we suspect, as varied and different as are spoken languages; they are, we now recognize, not at all parasitic on the spoken languages around them; and they have been, regrettably, little studied so far.

How do sign languages differ from spoken languages? How are they similar? What is characteristic of language in general, encompassing both signed and spoken languages? These were among some of the fundamental questions which were discussed at a recent conference*.

By comparison with spoken languages, little is known about sign languages and the only substantial study to date is that of Klima and Bellugi (*The signs of language* Harvard Univ. Press, 1979) on American sign language (ASL). Cross-linguistic study with Chinese Sign Language, French Sign Language (FSL), British Sign Language (BSL), and others has only just begun. One of the interesting facts about these languages is that users of ASL find FSL much more intelligible than BSL, undoubtedly because the American and French sign languages are historically related to one another and quite independent of BSL. This is important

evidence for the independence of the signed from the spoken languages that surround them.

At first glance one might suspect that sign and speech are quite different, if for no other reason than we have two hands for articulation but only one tongue. Interestingly, however, in sign language bilateral gestures in which either opposition or symmetry between movements of the two arms is used seem to be rare. Historical analysis suggests that the evolution of signs may be in the direction of simple one-handed forms.

We can consider sign to entail the shape and movement of the dominant hand (signers can be right- or left-handed) from one place of articulation to another with coordinate gestures of the head and shoulders — just as speech may be thought of as movement of the tongue from one place of articulation to another with co-ordinate closures and releases of the lips and larynx. The places of articulation for signs are centered in two distinct areas. One is

*A Dahlem workshop on Sign Language and Spoken Language, held in Berlin 24-28 March 1980, under the auspices of Senat der Stadt Berlin and Stifterverband für die Deutsche Wissenschaft. The proceedings will be published later this year by Dahlem Konferenzen, edited by U. Bellugi and M. Studdert-Kennedy.