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PREFACE

The British contribution to the SCOPE Programme on the Ecology of Biological Invasions

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SCOPE, the Scientific Committee on Problems of the Environment, analyses such problems by means of programmes leading to published reports on the state of knowledge. The meeting reported here was the major British contribution to the SCOPE Programme on the Ecology of Biological Invasions. It is a slightly unusual programme for SCOPE in that the subject is an entirely biological one, and also in that, although most of the problems are caused by invasions induced by man, some can arise as a result of natural extensions of range. Such effects are often acute in ecosystems with a mediterranean climate away from the Mediterranean itself, that is to say in California, South Africa and Australia. These mediterranean zones are in different biogeographical regions, so the organisms native and introduced to them have, in general, no evolutionary experience of each other. Species introduced from one such region to another have frequently spread in semi-natural and natural ecosystems. The SCOPE programme arises from concern about the impact and management of such pests in particular. The preamble to the programme (Anon. 1985) therefore talks about 'the introduction of plants, animals and micro-organisms to regions remote from their centres of origin.' It goes on to say that the 'areas include a wide variety of non-agricultural, non-urban land such as native forests and rangelands, and protected areas like National Parks and Ecological Reserves.'

With this set of problems in mind, the main questions to be resolved, as specified by SCOPE, are:

- (1) What factors determine whether a species will become an invader or not?
- (2) What site properties determine whether an ecological system will be prone to, or resistant to, invasion?
- (3) How should management systems be developed to best advantage, given the knowledge gained from attempting to answer questions 1 and 2?

The 'Ecology of Biological Invasions' Programme was set up in 1982; its final meeting was held in November 1986. In the period between, national committees have organized meetings in the United States of America (Mooney & Drake 1986), Australia (Groves & Burdon 1986) and South Africa (Macdonald *et al.* 1986). This Discussion Meeting is the British national meeting, organized by an *ad hoc* committee under the British National Committee for Problems

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of the Environment. In addition, the members of the International Scientific Advisory Committee for the programme have undertaken to organize working parties on particular aspects of the problem, transcending national boundaries. Some of the conclusions from the working party on problems in nature reserves are given in this volume by Usher, and some of those of the working party on mathematical modelling, by Williamson & Brown. The other three working parties, on invasions into tropical ecosystems, mediterranean ecosystems, and on the history of invasions, have yet to meet. In addition to this Discussion Meeting, the British contribution has included a discussion session at the Annual General Meeting of the British Ecological Society in December 1984 and also the British Ecological Society Symposium in 1985 on 'Colonization, succession and stability' (Gray *et al.* 1987), although that symposium was an international meeting already under way before the British part of this SCOPE programme began.

The SCOPE programme is particularly concerned with natural ecosystems, but here in Britain such ecosystems are nowadays of very small extent, if indeed they exist at all. Possible examples are mountaintops, sand dunes, the bottoms of some lakes and the marine plankton, though it is doubtful if any of these does not show the measurable effects of man's activities. It therefore seemed appropriate to concentrate the British discussion on the area where British population biology has traditionally been strong, namely in the quantitative aspects of invasions, without attempting to distinguish, in the British context, between natural, semi-natural or more general aspects of the environment.

While this SCOPE programme has been in progress, another issue concerned with the general environment has arisen. This is the problem, which has proved extremely controversial in the United States, of the release of genetically engineered organisms into the natural environment, with the intention of producing a wide range of benefits to man. The SCOPE programme will probably be extended to include a discussion of this topic. In this country, the Ciba Foundation organized a discussion meeting on this topic (the proceedings of which will not be published), which followed the meeting reported here, and the Advisory Committee on Genetic Manipulation has issued guidelines (Newmark 1986).

The authors of this preface constituted the *ad hoc* committee for the British contribution to this SCOPE programme, set up under the British National Committee on Problems of the Environment, and met five times under the chairmanship of one of us (M. H. W.).

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