

# Preface

**T**o interpret the phenomena of biogeography, we need to understand many different areas of science – for example, evolution, taxonomy, ecology, geology, palaeontology and climatology. Although each area makes its own individual contribution, a textbook such as this therefore has to cover a similar scope and must be suitable for students with a variety of different backgrounds. This is particularly necessary today, when the coming-together of molecular methods of demonstrating relationships, and of the cladistic technique of imposing pattern upon the resulting data, is revolutionizing our understanding of biogeography.

Many changes have taken place in the study of biogeography over the 43 years and nine editions that have now passed in the life of this textbook. Back in 1973, the depth of the problem that our species poses for our planet's biota and climate was hardly appreciated, and the 'greenhouse effect' was still mainly a concern for horticulturalists rather than a worry for the whole planet. It was not until the 1980s that the evidence that the Earth's climate is changing, and that this is increasingly the result of human activities, became steadily greater. In interpreting the interaction between the physical world and the living world, and of the human impact on each of these, biogeography clearly has a major role to play in assessing the likely results of climatic change and in suggesting how best to counter them. As climatic change renders old crop areas less fertile, will it be possible to find new areas to replace them – and, if so, where? Or shall we have to find new varieties of plant, adapted to these new conditions – and, if so, where are we likely to find them? The increasing urgency of these questions

led to a great increase in the amount of research on biogeography during the 1990s.

But it is not only our foodstuffs that are threatened by climate change; it is the diversity of life that inhabits environments that is shrinking and disappearing. This is not just a concern for the curators of museums and herbaria, for we are also becoming aware of the extent to which we rely on this diversity for new drugs as well as for new food-plants. So we became aware of the need to census this diversity, in order to appreciate where it is greatest and where it is under particular threat. Which habitats are threatened, where, and how should we attempt to preserve them?

Until recently, biologists were unable to document the dates at which new species appeared and diverged from one another. As a result, it was impossible to be sure of the relationship between these biological processes and events such as the separation of units of land by plate tectonics or climatic change. The rise of molecular methods of investigation that provide reliable dates for the times of appearance and divergence of species has given us new confidence in the accuracy of our biogeographical analyses, based on rigorous techniques of analysis of relationships in time and space, using increasingly complex and sophisticated computer algorithms. At last it seems that biogeographical research is revealing, with increasing scope and detail, a single, consistent story of the history of the biogeography of the world today and of the processes that led to it.

This understanding may have come just in time, for it is clear that it is imperative that we conserve

what is left of the natural world of our planet. In this new edition, we welcome the contributions of Richard Ladle, who has not only helped in the revision of some previously existing chapters, but also contributed a new chapter on 'Conservation Biogeography' (Chapter 14). In this chapter he outlines the startling new techniques that are now becoming available for gathering and integrating information on the distribution of species. It is up to the new generations of biogeographers to find ways to use this increasing wealth of data to construct clear arguments that will convince the (sometimes reluctant) politicians and businessmen of the validity of their case. Only then can the vital step of transforming scientific knowledge into

potential action take place. We can only hope that this will happen sufficiently soon to save the living world of our planet as we know it today.

After all these years and editions, this is probably the last time that Peter Moore and I will contribute to this book; it has been a long and happy collaboration. We welcome Richard Ladle as the first of a new group of biogeographers who will, we hope, take the book into the future. It is also appropriate now to remember that the first edition was the work, not only of Dr Peter Moore and myself, but also of our colleague Dr Ian Healey, who sadly died before that work was published.

Barry Cox