

Preface

THIS book had its genesis at an encounter with the title “Unity in Diversity. A Conference on Ecology after the Legacy of Ramon Margalef”, organised on a team basis by three Spanish scientific societies, the Spanish Association of Terrestrial Ecology (AEET), the Iberian Limnological Association (AIL, formerly AEL) and the Spanish Society of Ethology (SEE), hosted by CosmoCaixa, The Science Museum of the “la Caixa” Foundation, in Barcelona, and sponsored by the Ministry of Education and Science, the Spanish National Research Council (CSIC) and the Fundación Biodiversidad. The name of the event sought to encapsulate Margalef’s central contribution and to stimulate discussion about the current state of ecology and its ability to mount a cohesive response to the challenges of global change and environmental crisis. Ecology, as a science of synthesis, sets out to explain the functioning of ecological systems by integrating knowledge drawn, in the main, from other sciences. Besides biology, ecology interacts with sciences like physics, in particular thermodynamics, which offers an explanatory framework for ecosystem functioning, mathematics, which gives us the tools to translate ecological theories into manageable expressions, and chemistry, which helps us to understand biogeochemical cycles and the matter and energy transformations at work in ecosystemic processes.

The conference attracted a wide and varied scientific public from Spain and other countries, with different backgrounds and professional approaches. Terrestrial, marine, freshwater, system and population ecologists, ecophysicologists, edaphologists, ethologists and biogeochemists (to skip quickly through the list) advanced and debated ideas about how to carry forward this increasingly front-line science, drawing on the conceptual legacy of Margalef. Much time was occupied by a discussion about biodiversity in its

broadest sense, ranging from ecological theories and models, including non-equilibrium models, which try to explain the coexistence of species in nature, to the role of spatial and temporal heterogeneity in biodiversity maintenance. Of course some attention was also paid to practical aspects of species conservation and the pressures exerted by habitat fragmentation. Climate change and its effects on terrestrial and aquatic systems, as regards both their functioning and the structure of the biological communities they sustain through interaction with the physical medium, were also the subject of insightful scientific contributions and debate, with frequent reference to the severe threats of climate change to our planet. The “Margalefian” view of the human species as one more species in nature, albeit one with tremendous power, was the presiding spirit of the conference and gave rise to interesting contributions about man’s relationship with the natural world—a theme that for Margalef, who was defined as a humanist before a scientist, shaped all his research.

Other sessions touched upon the relations between living beings and between them and their environment in an ecological and evolutionary context, covering from crypsis and mimicry through to the ecology of species interactions, the ecology of animal behaviour and, in general, the survival strategies of living creatures. Not everything presented and discussed there has made it into this publication for obvious reasons of space. However, the debates that took place have contributed to the structure of this book and have undoubtedly enriched the contents of the selected chapters, and most notably the reflections that bring it to a close.

After a personal and scientific portrait of Margalef as one of Spain’s most influential scientists and an inspiration for various generations of ecologists, the book divides into six sections, each comprising various chapters. The first of these sections looks at the dynamic nature of ecosystems and their equally dynamic responses to perturbations, leading on to some necessarily brief contributions on global change and its impacts on natural systems. Biological diversity is the subject of the next six chapters, spread over two sections with contents ranging from core aspects of biodiversity, like its relationship with ecosystem functioning or the processes behind species coexistence, to practical considerations like how to con-

serve biodiversity, our natural capital, through the throes of its present crisis. Finally, our last two sections explore the limits of ecology, with regard to its boundaries with other disciplines and its ability to achieve a synthesis.

The conference closed with a round table discussion with a panel of speakers and questions and comments from the floor. It was this session that inspired the closing chapter or epilogue of the present volume. Among its firmest conclusions was the need for theory development to put ecology on an equal footing with other sciences as regards generalisation and predictive capacity. No less clear was the view that all approaches to ecology are in principle admissible and worthy of exploration, although traditional frontiers between subdisciplines and study ecosystems (for instance, aquatic versus terrestrial) are artificial and should be set aside in the interest of ecology's progress as an emerging discipline. It was this thinking that inspired the title of the conference and now the book: "Unity in Diversity", that is, the pursuit of a common body of ecological knowledge based on the diversity of life and the varied approaches that we ecologists use in its study.

THE EDITORS