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[August 1991]
EXAMPLES OF AUTHOR-LETTERED HALF-TONES

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Why do some leaves have smooth margins whereas others have a jagged edge? Why do we have corals and other marine invertebrates with symbiotic photosynthetic microbes, but no green vertebrates? Why do those animals that eat plants generally rely on microbes in their guts to digest the cellulose, rather than producing the necessary enzymes for themselves? If the evolution of biotic pollination by angiosperms was the secret of their evolutionary success, why have so many of them (including the grasses) reverted to wind pollination? The contributors to this volume attempt to answer some of these questions, and indeed the broader problem of what do these questions have in common?

How far have the whole complex series of interactions between plants and animals influenced the evolutionary progression of each group? The topics dealt with here range from the fossil evidence for the earliest assault of the arthropods on the first land plants, to biochemical warfare between plant and herbivore, as each group has been driven to respond to the innovations of the other. Vertebrates and insects have, in their different ways, undergone major modifications of their structure, and particularly their mouthparts and gut, to cope with a vegetarian diet. But equally, the impact of browsing and grazing has forced higher plants to modify their programme of growth to cope with losing parts of the whole. This may have been one of the main forces favouring a flexible modular growth programme, rather than a determinate one.

This collection of papers, together with the lively discussion that they provoked, is taken from a Royal Society Discussion Meeting held on 27 and 28 February 1991. It records the state of development of one of the fast-growing areas of biology and brings together such diverse fields as biochemistry, palaeontology, cell biology, mammal and insect behavioural studies, plant development and pollination biology.
What are the regulatory factors that, over the long run, prevent a population from realizing its potential for unbounded increase? How do these regulatory factors combine to produce observed patterns in the relative abundance of species? How do these dynamical factors influence the structure of plant and animal communities? And, ultimately, how does all this add up to determine the number of species, either locally or globally.

The papers in this volume survey recent advances in studies of these questions, emphasizing the integration of empirical studies with ecological theory. Overall, the book has the deliberate aim of shaping an agenda for research, towards a clearer understanding of how many species there are, and why.


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MOLECULES THROUGH TIME
Fossil Molecules and Biochemical Systematics

Organized and edited by G. Eglinton and G.B. Curry

Organic molecules survive in the geological record! In fact the organic remains of life are abundant in rocks and fossils, and some biomolecules are among the strongest and most resilient structures on this planet, and as a consequence have good fossilization potential.

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