

Book reviews

writer and artist will educate as well as entertain, and so will play a role in the argument for the preservation of at least a part of the world's rapidly diminishing rain forests.

Michael Kavanagh, WWF Malaysia

The Hummingbirds of North America

Paul A. Johnsgard

Smithsonian Institution Press, 1983, £26.00

Hummingbirds, because of their many unique characteristics, have a great appeal to ornithologists and others interested in natural history, especially botanists; the latter because of the co-evolution, or mutual adaptations, that have occurred between hummingbirds and the flowers at which they feed.

About two-thirds of this attractive book is an account of the 23 species of hummingbird found in America north of the Mexican border. For each species there is a distribution map and a synopsis of present knowledge well laid out under side-headings such as identification, movements, foraging behaviour (including floral ecology) and breeding biology. This makes reference easy and concise. For anyone visiting North America, this book will provide a satisfying hummingbird handbook as there is sufficient detail to check one's own observations against previous ones. Identification is enhanced and aided by 16 full-page water colour illustrations by James McClelland. Where there is sexual dimorphism, both male and female are illustrated and all are depicted perched or in flight, foraging at their native flowering plants. The proportions and colouring of the hummingbirds are excellent, except for the wings, which are mostly shown too pale.

The weakest section of the book is the six chapters on the comparative biology of all the species of hummingbirds, most of which are tropical. There is no original material here, but a re-statement of the research or even anecdotes of other authors. Re-statements are seldom as meaningful as the original, and may on occasion be misleading through errors of interpretation or by excessive condensing of complex facts.

There are six excellent appendices, which include an up-to-date classification of the 342 humming-

bird species of the world, giving both English and scientific names and a brief statement of their ranges, a list of the origin and meaning of the scientific names of hummingbirds, and, most usefully, a classified list of North American plants that are adapted for hummingbird pollination. There is also a complicated identification guide which seems difficult to use.

Barbara Snow, British Museum (Natural History)

Our Green and Living World

E.S. Ayensu, V.H. Heywood, G.L. Lucas and

R.A. DeFilipps

Cambridge University Press, 1984, £12.95

In his introduction, Prince Philip writes: 'Noah is said to have built an ark to rescue the animals from the flood. What the writer of Genesis fails to recall is that Noah must also have collected the seeds of all the plants, because without them neither his animals nor his family could possibly have survived'. This lavish book is a celebration of plants, and is an answer to the traditional one-sided view of creation presented by many wildlife books. It helps to strengthen the growing realisation that our cuddly animals cannot survive without an infrastructure of plants.

It has spectacular illustrations and a text which is a pleasure to read. There is plenty of information on plants and their uses, but the bias is always towards the uses of plants to mankind—the reasons, in fact, why Noah would have stored their seeds in the ark. The traditional uses of plants for a variety of purposes must continue in the underdeveloped world as an alternative to expensive, resource-intensive manufactured products, while neglected or new crops must be investigated to provide all nations with renewable sources of raw materials. Such sustainable use of species to support both rural communities and industries is one of the aims of the World Conservation Strategy.

Spelling out this aim in such an attractive form as this book is admirable, but I find myself unable to agree with the authors' optimism that there is time to halt and reverse the increasing tide of destruction to the world's vegetation on a significant scale. With massive goodwill from many people, starvation is being kept at bay in just one of Africa's drought-stricken countries. Will the effort

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continue to get their agriculture working again? Or is it too late anyway to repair the damage of drought, neglect and overexploitation of the land?

Robert Burton, naturalist and author

Milkweed Butterflies

P.R. Ackery and R.I. Vane-Wright
British Museum (Natural History), 1984, £50.00

The milkweed butterflies (Danainae) comprise a small subfamily of the Nymphalidae containing about 150 species worldwide. Their common name derives from the usual host-plants, the milkweeds (Asclepiadaceae and Apocyanaceae), plants with a milky sap that may contain substances poisonous or distasteful to many animals. By poorly-understood mechanisms, milkweed butterflies selectively store such toxins in their bodies and thus themselves become distasteful to predators. Most milkweed butterflies are tropical in distribution and, although they are not especially diverse, their chemical protection allows them to form a conspicuous and important part of butterfly faunas.

The full title '*Milkweed Butterflies—their Cladistics and Biology*' is described in a more 'user-friendly' style on the title page as '... an account of the natural history of the Danainae...'. What a relief it is to see the systematics of a group of insects being presented in a readable, absorbing and yet comprehensively authoritative style! To be sure, the authors could hardly wish for finer material with which to work, the breadth of behavioural and physical adaptations within the group is quite stunning. The courtship patterns of *Danaus* and others, in which 'love-dust', in the form of special scent-bearing scales from the male's wings, is puffed onto the female's antennae, makes the fumbling and posturing of vertebrates seem very gauche. The migrations of the North American monarch butterfly, culminating in mass roosts in California and Mexico, are now well known as one of the wonders of the natural world.

Research on the milkweed butterflies has proceeded for about a century-and-a-half; Ackery and Vane-Wright have, themselves, taken almost a decade to summarise, interpret and commit to paper the accumulated data. The time spent is reflected in the quality and polished style of the

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Amauris niavius, showing the abdominal brushes, which, when in contact with the hindwing patches, produce sex-pheromones (P.R. Ackery).

book. In reading the pages one feels a sense of history unfolding: Henry Bates pondering over the mysteries of mimicry in the butterflies of the Amazon jungle, Alfred Russel Wallace extending those ideas to the Orient and considering natural selection. The protection incurred by unpalatable chemicals was long suspected to be the reason why other species mimic milkweed butterflies, but it was not until the 1960s that toxic cardenolides and alkaloids were isolated, capable of inhibiting the action of vital nerve and muscle enzymes. Since then, the science of ecological chemistry has expanded and the exciting story of co-evolution between plants and animals has continued to unfold. The biological arms race of the natural world is not only a driving force in



Male *Danaus genutia* 'feeding' on *Crotalaria retusa* to obtain pyrrolizidine alkaloids, precursors of major components of their sex-pheromones. This behaviour, which is independent of 'normal' feeding, probably contributes towards their unpalatability (P.R. Ackery).