

ZOOLOGY

The Age of Mammals

By Björn Kurtén. Weidenfeld and Nicolson, London. 1971. 250 p. The World Naturalist Series. About \$9.00.

I have often admired the clarity with which Scandinavian scientists write in English. This is one of the strong points of Kurtén's book. It is clear, readable, and highly informative to both specialists and laymen. Kurtén's reasonable and up-to-date summary of the origins of man is particularly interesting. A rarity in a book of this nature is the author's refreshingly direct discussion of man's responsibility for maintaining the quality of his environment, and his thoughts on the future of man.

In 1910, the well-known paleontologist Henry Fairfield Osborn published an important book "The Age of Mammals in Europe, Asia and North America." It is Kurtén's goal to revise, update, and simplify that rather technical account. Also, he wants to impress us with the responsibility we have for this earth of ours, which has supported such an abundance of life during ages longer than we can comprehend.

Following an initial chapter on the nature of fossils and the origin of mammals, the author succinctly describes the mammalian fauna, flora, and major geographic features of the continents during each of the Cenozoic epochs from Paleocene to Pleistocene — a period which covers the last 65 million years. Kurtén recognizes the Paleocene as a time of mammalian conquest of the land after extinction of the dinosaurs, the Eocene as a period of consolidation, the Oligocene as an epoch of transition, and the Miocene as a long period dominated by change — the uplift of mountain ranges and vanishing of the extensive Tethys Sea. The Pliocene he regards as "... something of a paradise lost, a climax of the Age of Mammals before the coming of the cold; a time when life was richer, more exuberant than ever before or after."

Two interpolated chapters provide a description of the peculiar mammalian faunas which arose in Australia and South America — two chips of the former supercontinent of Gondwanaland which remained isolated for most of the Age of Mammals. Here, one is continually reminded that the earth's environmental niches have acted as molds into

which the genetically plastic fluid of life has been poured many times at different stages. For instance, *Thylacosmilus* a marsupial of the South American Pliocene shows an amazing resemblance to the more advanced sabretooth cats.

Twenty-eight pages are devoted to a discussion of the Pleistocene. Kurtén thinks that Milankovitch's hypothesis is the best available explanation of the peculiar cold-warm oscillations of the Pleistocene. This hypothesis stresses that perturbations of the earth's movement around the sun have a variable effect on the distribution of solar radiation received by the earth, producing alternately cool summers and cold winters, which would reduce melting and promote growth of inland ice, and hot summers and mild winters, which would increase melting leading to interglacial conditions. The author has no hesitation in saying that we are presently in an interglacial and "... on our way towards a new glaciation." An otherwise excellent paragraph describing radiocarbon dating is flawed because it is not stated that C^{14} in an organism decays at a steady, known rate after its death; and there is no mention of the half-life of that isotope. Kurtén demonstrates very effectively the frequency of giant forms among most orders of larger ice age mammals, and among the rodents, remarks on the giant beaver, which was almost as large as a black bear. Conversely, he shows that a great many mammals evolving in oceanic islands were dwarfed. This trend led to the development of the extraordinary Maltese 'donkey elephant' which in adulthood was 3 feet high at the shoulder.

Most of man's evolution has occurred during the last 3 million years, comprising the Pleistocene. In a final chapter on man, the author strongly supports Paul Martin's hypothesis of human "overkill" to explain the great extinction among large ice age mammals, which occurred about 10,000 years ago in North America. He lays stress on human burning of the landscape as a factor in destroying the ice-age megafauna. However, to my knowledge, evidence supporting this idea is poor, or has not been well marshalled. The last few pages on man's future are deeply considered, and cannot be effectively summarized. Read them.

The book concludes with appendices listing orders of four-limbed vertebrates, their common names and approximate spans of existence during the Cenozoic, and providing suggestions for background reading on each of the chapters. Detailed

references are given for 140 pertinent books and papers. There are also short indices to authors, stratigraphic and locality names, and Latin names of species mentioned in the text.

Illustrations are an important part of this book. Simple maps display the approximate distribution of land and sea at various times during the last 65 million years. Most of Margaret Lambert's figures depicting restorations of extinct mammals are diagrammatic and rather uninspired, but this does not apply to her beautiful work in Plate 5 showing *Desmostylus* (a plant-eating, amphibious mammal) retreating from the territory of the large "sea-elephant" *Allodesmus*. A good deal of speculation is involved in making restorations of extinct vertebrates, because of the generally fragmentary nature of their remains. I think Kurtén's restoration of

the scimitar cat, with cat-like forelimbs and bear-like hind limbs is highly controversial. However, in another case where controversy exists as to whether the "marsupial lion" *Thylacoleo* was a harmless fruit-eater or a bloodthirsty carnivore, Kurtén has confronted the problem directly by showing both versions!

I recommend this book to anyone interested in biology or the earth sciences because of its finely integrated perspective on mammalian history. Anthropologists should read it because it relates man so well to his fellow mammals. It gives us our bearings in the animal kingdom.

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Parasitic Insects

By R. R. Askew. American Elsevier Publishing Company Inc., New York. 1971. 316 p. \$11.50.

Askew presents a discussion of the parasitic form of insects, their ecology, and their evolution. Parasitism is defined in the broad sense as the relationship between two species, in which the species designated as parasitic obtains its nutritional requirements from the body of the host species. The author supports his general theories and conclusions with examples from the literature on world fauna up to 1969.

In the first section of the book, insects which are parasitic as adults are considered. A chapter on mouthparts reviews various modifications for parasitism of the basic insect structures. In "Lice", biting and sucking forms are combined in an aggregate which might be clearer had more headings been used. Fleas, blood-sucking flies, and Diptera Pupipara are presented in separate chapters. These are well done except that some species which are included fit the titles only in the broadest sense. "Bugs, earwigs, beetles, and moths" contains the few species in these Orders which are parasitic as adults. The author completes this section with a short chapter dealing with blood-sucking insects as vectors of human disease.

Section II of *Parasitic Insects* presents insects which are 'parasitic' as immature forms. "Hymenoptera" comprises nearly half of the section. This Order contains the largest number of 'para-

sitic' species and the author has specialized in the study of the Chalcidoidea (Hymenoptera). Diptera form the next largest group. A separate chapter is inserted to discuss Dipteran larvae which cause myiasis in vertebrates. Neuroptera, Lepidoptera, and Coleoptera are combined in one chapter and another contains a full discussion of the Strepsiptera. Askew promotes the utilization of insect 'parasites' in his chapter, "Biological control of insect pests". The continuum of behavior patterns, from free-living types related to 'parasitic' species to true parasites in the strictest sense, is illustrated and discussed in "Commensalism, inquilinism, and social parasitism". General remarks are continued in the final chapter and some examples of parasitism in the Crustacea are added for comparison. A bibliography of literature available to 1969 and cited in the text completes the book.

Although it may occasionally grate on some editorial nerves, this text should be of value to students of entomology and to those studying related host species. The book is well illustrated and presents information not previously available in one place.

Parasitic Insects is a welcome companion volume to Clausen's *Entomophagous Insects* and a useful source of entomological information for those in medical and veterinary research.

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