

uncertain in an age in which public funding overall is in short supply.

The emphasis is therefore increasingly on what Madders calls “useful space”. This, by definition, means space activities that impinge on other sectors of life ranging from telecommunications and television transmission protection, through navigation and location services to environmental protection, land use, treaty and convention verification, and so on. The end-users are not in the space community, and indeed the space element is often only one of many components. Not surprisingly, science ministries are not keen to shoulder the costs indefinitely. It follows, therefore, that future projects need to be specified and at least partially funded outside the space agency circuit. Even in meteorology, where the use of space techniques is seldom contested, it has been difficult to persuade the end-users to take over funding responsibility from the science ministries; it is considerably harder in other fields.

The space agencies still have an important contribution to make even in the area of “useful space”, but it is one that has to be carefully negotiated with the new users and funders. Aerosat was a worthy international project in the 1970s, but it failed mainly because the end-users were not behind it.

This change of emphasis is reflected in the functions and status of space agencies, and in many parts of the world they have lost a lot of their former influence. Although this point is left until very late in Madders’s book, it is brought out by a description of the increasing role of the European Commission in the development of European space science. The very balanced treatment shows that this is not simply a story of rivalry between the commission and ESA, and that the newcomer can in fact be helpful to the future development of space science, particularly in the complicated area of “useful space” where public and private sectors have to learn to operate together more efficiently.

Madders admirably controls his philosophical yearnings until the last few pages, and only then does he allow himself a few brave words about the Space Age’s most valuable gift being the “power it gives us to shape a future of greater choice”.

In moments mellowed by a judicious liquid intake, I can agree with him. But for the rest of the time (and this is still the larger portion) I am oppressed by the continuing petty squabbles among European politicians in our crab-like movement towards a stronger Europe, and their inability to spend enough time on a more impartial assessment of the advantages of meaningful cooperation in European space. I only hope that Madders’s optimism is justified. □

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## Creatures of mystery

*Snakes in Question: The Smithsonian Answer Book* by Carl H. Ernst and George R. Zug *Smithsonian Institution Press: 1997. Pp. 203. \$49, £38.25*

*Kaleidoscopic Tree Boas: The Genus Corallus of Tropical America* by Peter J. Stafford and Robert W. Henderson *Krieger: 1996. Pp. 86. \$28.50, £26.50*

*Coral Snakes of the Americas: Biology, Identification, and Venoms* by Janis A. Roze *Krieger: 1996. Pp. 328. \$95, £86.95*

*Venomous Snakes: Ecology, Evolution and Snakebites* by R. S. Thorpe, W. Wüster and Anita Malhota *Oxford University Press: 1996. Pp. 276. £75, \$145*

*Snakes: The Evolution of Mystery in Nature* by Harry W. Greene *University of California Press: 1997. Pp. 351. \$45, £35*

J. L. Cloudsley-Thompson

Contrary to popular belief, the majority of snakes, including many of the most venomous, tend to be timid and retiring. Like Greta Garbo, they prefer to be left alone. By contrast, human beings find it difficult to leave snakes to their own devices. They arouse scientific curiosity and our aesthetic sense because many of them are so beautiful. In some people as well as certain wild animals, they engender a sense of fear. All these interests are catered for in these books.

In a chapter on folk tales, Carl Ernst and George Zug point out that no animal is the subject of so many myths and half-truths as is the snake, to which human beings attribute symbolic and erotic meanings. *Snakes in Question* sets out to answer the questions most frequently asked about snakes by both adults and children. It also offers insight into their basic biology and contains useful data such as the body sizes of selected species and their speed of locomotion. It may reassure some people to learn that no snake can move half as fast as a human being.

*Kaleidoscopic Tree Boas* covers the natural history and captive management of the genus *Corallus*, a small group of highly-adapted tree-dwelling snakes whose striking appearance and often exorbitant coloration are clearly illustrated in 53 plates. Keys to the four known species and diagnoses of their subspecies are provided in this useful little guide.

Far more ambitious and technical is the monographic treatment of the *Coral Snakes of the Americas* by Janis Roze. Not only are full descriptions of nearly 150 species and subspecies given, but maps of their distribu-

tion and variations are provided. Also included are chapters on morphology, ecology, feeding, food, cannibalism, reproduction, enemies and defence. There is a section on venoms and their effects, an extensive bibliography and detailed indexes.

The chapter on mimicry is especially interesting as it reviews the long-standing problems presented by false coral snakes and the ‘deadly model’ paradox. Mimicry relationships represent a wide array from strict batesian to extreme mullerian mimicry. Following Harry Greene and R. McDiarmid, the so-called ‘mertensian’ is regarded as a version of mullerian mimicry and not as a different category of mimicry.

*Venomous Snakes* is the latest volume of Symposia of the Zoological Society of London, and maintains the customary high standard of that series. The intention of the symposium’s organizers was to bring together leading researchers on all aspects of venomous snake biology to discuss a wide range of topics and forge stronger links among themselves. The 18 chapters are authoritative, specialized and diverse. Their subjects range from the systematics of sea snakes and the DNA evolution of pit vipers of the genus *Bothrops* to a review of phospholipases in snake venom. The impact of molecular methods for the reconstruction of phylogenetics is apparent in six of the nine papers devoted to mainly taxonomic subjects.

For most herpetologists — and zoologists in general — the most interesting of these books will be Harry Greene’s *Snakes: The Evolution of Mystery in Nature*. This is by no means a superficial account, as its title might suggest, but an extremely well-written and scientific introduction to the evolutionary biology of snakes, interwoven with folklore and original observations on their natural history, supported by a massive bibliography and index.

The hundreds of outstanding colour photographs by Michael and Patricia Fogden not only illustrate the various species but often show them in action — envenoming or swallowing their prey (which sometimes includes other snakes), fighting, mating, giving birth and hatching from eggs. Most of these photographs were taken in the wild, in 18 countries on six continents.

This is a book to read for interest and pleasure as well as for accurate and original scientific information. □

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