

animals, human evolution, tools and early modes of production, diet, disease and demography. Part II, "Culture", is loosely ordered by the contested idea that cultures should be treated as systems of symbolic action, but the section concludes with an essay on ethnicity and nationalism that might have fitted more easily into Part III, "Social Life". This last section contains an even more eclectic set of essays, ranging from "Social aspects of language use" to "The nation state, colonial expansion and the contemporary world order".

Ingold concedes that a number of alternative topics might equally well have been treated, and there is not much point in listing some obvious gaps, although it is perhaps worth asking why — for there are fewer than 40 chapters in all — it was thought necessary to carry articles on "Perceptions of time", "Myth and metaphor", "Ritual and performance", "The anthropology of art" and "Music and dance". The choice of articles was bound to be idiosyncratic, however; despite the promise of the Introduction, the contributors do not develop a new synthesizing vision that might have dictated a more

coherent selection. Most of the contributors present their material within the conventional frameworks of their sub-disciplines. A few authors do advocate various synthesizing theories, but there is little common ground between, for example, F. J. Odling-Smee's sophisticated essay on niche construction and evolution and R. I. M. Dunbar's ideas about the broad differences between human and animal sociality; and neither is obviously relevant to what, for instance, Simon Roberts has to say about law and dispute processes, or James Weiner about myth and metaphor or Peter Worsley about colonialism.

This book is not an encyclopaedia of anthropology, much less of the human sciences, nor does it offer a new synthesis. It is a useful collection of generally authoritative reviews of some of the various projects in which anthropologists are currently engaged, occasionally (too occasionally) in a fruitful interdisciplinary fashion. □

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Speculative astronomy

Tobias Owen

What if The Moon Didn't Exist? Voyages to Earths That Might Have Been. By Neil F. Comins. *HarperCollins: 1994. Pp. 315. \$20.*

WHAT if this book didn't exist? We would miss the author's playful speculations about alternative Earths, about the ways in which our planet might have evolved if circumstances surrounding its origin and early history had been different. But we would be spared a lot of misinformation.

Among the alternative worlds Comins considers are Earth with no Moon, Earth tipped on its side, Earth with a closer Moon and Earth with a more massive Sun. He includes a discussion of possible stellar catastrophes: a nearby supernova explosion, collision of Earth with a tiny black hole and a near-miss by a passing star. In the last chapter he addresses an imminent earthly concern: the depletion of the ozone layer.

The success of such a book depends on a combination of good writing, fresh ideas and a solid grasp of basic science. Comins is most successful when writing about stellar variations. But his discussions of planetary phenomena are often full of errors and his flights of fancy over the evolution of life on Earth seem unduly influenced by a few narrow viewpoints.

The past 30 years of planetary exploration have vastly increased our understanding of our nearest neighbours in space.

Unfortunately, little of this new knowledge penetrates the book. We find anomalies such as this: "Jupiter and Saturn . . . rotate so rapidly that the friction between their surfaces and atmospheres pulls the air into narrow streaming belts". It is well known that these giant planets do not have surfaces. The appearance Comins describes results from motions confined to the atmospheres. The discussion of the Roche limit is murky at best. Contrary to the author's assertion that the rings of Saturn "are all inside Saturn's Roche limit", the G and E rings are outside. Frozen methane and ammonia are not major components of comet nuclei: they may not be present at all.

The title chapter on the development of Earth with no Moon makes no mention of Mars and Venus, two other planets with either negligible moons (Mars) or none (Venus). So in asserting that a moonless Earth would have a rotation period of 6 hours, the author fails to explain why the (retrograde!) rotation period of Venus is 243 days, while that of Mars is about the same as Earth's. These variations can be explained through the influence of impacts by large planetesimals. The author correctly identifies such an impact as the source of our Moon, but he ignores its effect on Earth's rotation rate and the inclination of our planet's rotational axis.

A lack of familiarity with the importance of impacts on planetary evolution — one of the great insights provided by the

golden age of space exploration — also hinders the discussion of the origin and early history of Earth's atmosphere. Comins suggests that the 15 per cent difference between the amounts of carbon dioxide on Venus and Earth results from the Moon-forming impact — a rather small difference for such a large event. And how are we to account for the tiny amount of carbon dioxide on Mars?

In his treatment of the evolution of life on these alternative worlds, Comins becomes obsessed with circadian rhythms. He worries about the survival of life on planets with short rotation periods or seasonally lengthened days and nights, but he tells us nothing about the Eskimos, penguins, polar bears, seals and other organisms who live quite happily on our own planet in regions with diurnal rhythms very different from those at lower latitudes.

It is not easy to discern the book's intended audience. It would not be too difficult for an educated lay reader, preferably with a college degree. Such a person may be put off by phrases such as "It lays on the ecliptic" yet would probably know, unlike the author, that it is hydrogen sulphide and not sulphur dioxide that smells like rotten eggs.

Does any of this really matter? Don't we simply want to be entertained? After all, Van Gogh made marvellous paintings portraying the Moon in impossible phases. But this book sets out to be scientific, so it must be judged by different criteria. What if there were a second edition, thoroughly refereed and carefully edited? Now that might make our circadian rhythms sing. □

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