consideration of the evolution of the "uroboros", defined as an interlocking and at least partially self-sustaining macromolecular assembly of considerable complexity. It is suggested that, after several pre-biotic steps, an RNA polymer (generated under hygroscopic conditions) placed some selectivity on self amino-acylations; these eventually resulted, via "ur-" (= primitive) t-RNAs and ur-ribosomes, in a selectivity of linkage of the amino acids to each other. How closely the description approaches the actual process by which cells evolved is of course difficult to ascertain, but earnest attempts such as this to construct models, which are at least plausible in terms of the properties of biomolecules, help to take the question of the origin of life out of the realm of the utterly mysterious.

Overall, I found this to be an interesting and instructive book but, in light of the factual errors it contains, it cannot be recommended as a textbook. □

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From terrestrial processes to martian features

Lionel Wilson

The Channels of Mars. By Victor R. Baker. Pp.198. US ISBN 0-292-71068-2; UK ISBN 0-85274-467-6 (University of Texas Press/Adam Hilger: 1982.) £22.50, $39.95.

AMONG all the bodies of the Solar System yet explored in detail, Mars appears to be the only one which has had an evolutionary history sufficiently like that of the Earth to make extensive comparisons readily possible, and, at the same time, sufficiently different to make the comparisons profitable in the study of both planets.

The least-readily understood surface features of the planet are the several varieties of channel and valley showing many of the characteristics which would be associated on Earth with fluvial, glacial or permafrost processes. Present-day surface temperature and atmospheric pressure conditions on Mars preclude the existence of liquid water for other than very short periods unless large volumes of water are involved. Thus, any model of the channel-forming process which requires protracted periods of gentle water action has profound implications for the environmental conditions prevailing at the time the channels were formed. It is clearly vital to establish the duration of the channel-forming events and the times in martian history at which they occurred.

Victor Baker has been associated with the study of the martian channels since their discovery. In this welcome survey, he succeeds in presenting a generally well-balanced review of the classification systems and morphological features of the channels and of ideas on their origins, appealing widely to Earth analogues. The overall picture which emerges is one of very slow, periglacial activity alternating with brief periods of catastrophic water release. The morphological evidence for the proposed ice-related mechanisms is strong and the physical models for the processes involving ground ice migration seem well founded.

Much of the book is devoted to those aspects of the larger channels which appear to demand catastrophic flooding by large and rapidly-released volumes of water. An extensive comparison is made between the martian features and the landforms developed in the Channeled Scabland of the north-western United States as a result of abrupt and massive water release from glacial lakes after failure of their ice dams. The morphological comparison is supported by calculation of a number of the fluid dynamic parameters associated with both martian and terrestrial floods. While the evidence for the formation of the martian channel forms by water flooding is compelling, the author is at pains to point out that we are not yet sure of the mechanisms whereby huge quantities of water are released abruptly from within the martian crust — though he does review a number of the suggestions which have appeared in print.

The style of Baker's presentation is such that it is hard to read individual chapters of this book in isolation: appreciation of the complete story requires reading the entire book. The work seems to be pitched at the undergraduate/postgraduate level, though the lay reader will have little difficulty in following the arguments and the large collection of references will be of value to the planetary science specialist. A notable feature of the book is the high quality of the many black-and-white photographs. The few typographical errors are almost all associated with numbers and equations and will be readily detected by the attentive reader. As much as anything else, the book whets one's appetite for further advances in this field. □

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