



Book Review

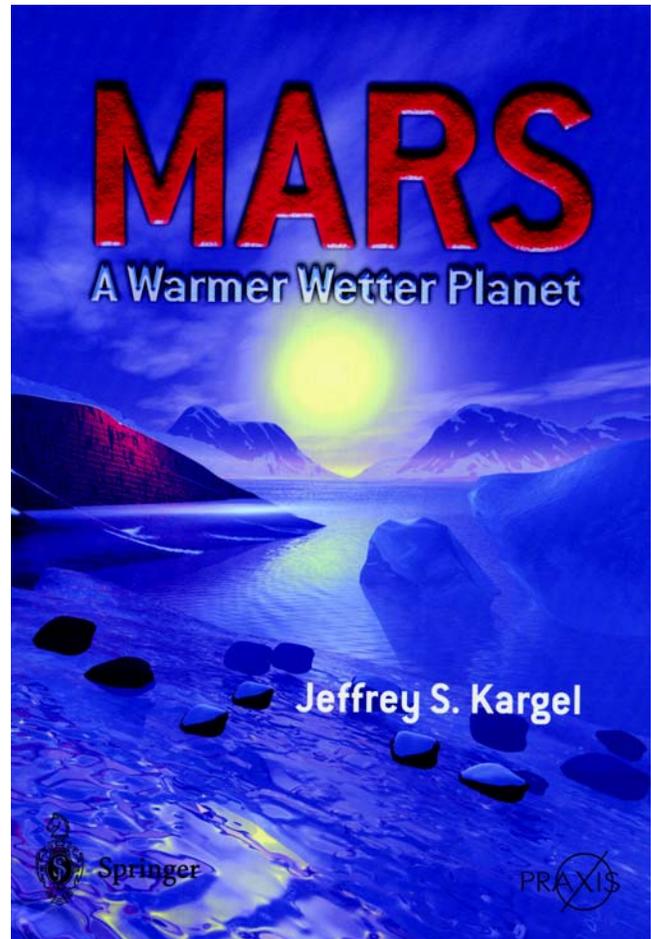
Mars—A warmer wetter planet, by Jeffrey S. Kargel. Springer-Verlag/Praxis, 2004, 557 pp., \$34.95, softcover. (ISBN 1-85233-568-8).

This book is a monumental accomplishment by a serious, creative planetary scientist who has been deeply involved in researching Mars for two decades. It is both vastly more sweeping in scope and much more narrowly focused than one might expect from its title. It ranges literally from early planetary concepts of the ancients to the ultimate death of Mars itself during the Sun's red giant phase several billion years from now. Yet Kargel focuses, for at least 325 pages, on just one, albeit vital, aspect of Mars: the past and present role of water and ice (and CO₂).

Kargel's book is unusual both in concept and in execution. It is no quick weekend read. Rather, it is more like books of a century ago, when the pace of life was slow, scholars had decades to compose a magnum opus, and readers had time to dwell in an author's universe. Consider the adventure books of Richard Halliburton, or scientific writings like those of physicist Arnold Sommerfeld. They had the freedom to fully detail their experiences, experiments, and thoughts, and—if written well—their books and articles were a joy to read then and remain so today. Nowadays, one more typically has to squeeze scientific writings into strict 750- or 2000-word limits. Kargel has reverted to the old-fashioned approach and this book will be a gold mine for future historians of science. Far from being an organized, formalistic treatise on its topic, *Mars* reads more like Moby Dick, swinging as it does from topic to topic, from history to the future, and from rigorous scientific argument to philosophical ruminations.

Set aside a month, if you possibly have the time, to explore Jeff Kargel's world; it will be a month well spent. After gorging on the almost endless text, start over and study the hundreds of illustrations (which are unnumbered and bear only a casual relationship to the neighboring text, but which are accompanied by extensive captions). The book also offers other features, like sidebars on various topics (printed in-line with the text, in different font) or astronaut Jack Schmitt's provocative foreword, which is dense with ideas, since he was allotted just five pages to cover what Kargel takes 500 pages to discuss. Ponder again the poems and literary snippets sprinkled throughout the text, then re-read Kargel's articulate insights, buried within hundreds of separate paragraphs, which you will have needed to mark during your first reading.

Who is the audience for this book, besides a few of the



author's closest colleagues? *Mars—A warmer wetter planet* is neither fish nor fowl. While many pages would be wonderful for a scientifically inclined layperson or a beginning science student, what should we make of a book with no glossary that uses, early on and with no definitions or explanations, nouns such as “clathrate,” “advection,” “thermohaline convection,” “Hesperian age,” “diapirism,” “C2 chondrite,” and “non-Newtonian power-law rheology?” And adjectives like “periglacial,” “clastic,” “lacustrine,” “thermokarstic,” “metasomatic,” “prokaryotic,” “eutectic,” “cryptoendolithic,” “ultramafic,” “mucusoid,” and “diagenetic” (readers of this journal may know most of these words, but I’ll daresay not all of them). Consider a book on Mars that lacks a single map of the planet (with, say, topography) that clearly labels major features mentioned in the text. Or a book on Mars with no diagram defining the frequently mentioned stratigraphic

epochs. Clearly, this book is not intended for non-professionals.

Yet *Mars* is even worse as a textbook or reference work. The index is a joke: there are only 98 entries other than proper names (counting both “lava” and “lava”). There are almost no formal citations to published papers, with the odd exception of 16 such citations in one figure caption. While Kargel describes many fascinating published ideas, only some of them may be found, using informal textual clues, in the brief, idiosyncratic bibliography. The last hope for a researcher to find an important item again in this book is through the table of contents. At least there is one! Alas, it, too, is useless: Kargel has chosen cutesy titles for the 120 sub-sections, like “Sheer madness,” “Tucson Mafia,” “Washed away,” “Through a glass darkly,” and “A pound of light,” few of which reliably indicate content. A reader takes a fascinating journey through this book, but unless you index it as you go or you have a photographic memory, *Mars* looks like the same thick, mysterious, impenetrable bundle of pages when you finish as it did when you started.

Jeffrey Kargel’s writing style is lucid and fun to read. Apart from a few technical parts—especially concerning Kargel’s areas of specialized expertise (e.g., Martian glaciation), one burst of equations on p. 224, and a section with 21 chemical formulae—the prose is readily digested by any space or Earth scientist. Buried in unexpected places are coherent essays that would be wonderful for students, on such topics as the uniformitarian principle, erosion, and the future history and death of planet Earth. But this volume seems wholly unedited, unorganized, and unchecked for its abundant redundancies. With no loss of content, whether Martian or supplementary, the book could be just half as long. While it was evidently written over the course of many years, then updated through spring 2004 (including a treatment of the early results of the Martian rovers Spirit and Opportunity), there has been not even a superficial attempt to delete obsolete sentences or paragraphs. Perhaps *Mars* reads like an endless blog because new results from the spacecraft on or orbiting Mars were pouring in faster than Kargel or his editor could put the book to bed.

Much of the narrative is unusual in modern science writing. We read about behind-the-scenes conflicts,

improperly rejected papers, hunches that never panned out, Kargel’s still-valid commentary on the unreal economics of President Bush’s Moon-Mars “vision,” and musings on the ethics of terraforming Mars and our ongoing “lunaforming” of Earth. Kargel’s perspective is open-minded and multi-disciplinary. He eschews certainty and is willing to speculate, often creatively and compellingly. There are actually inconsistencies in Kargel’s own assessments of several topics (e.g., on p. 192, he strongly disagrees about evidence for a past epoch of rainfall on Mars, yet he opens to the idea 50 pages later).

It is not even clear what the book’s subtitle, “A warmer wetter planet,” means to Kargel anymore; after all, he leans more than most researchers toward CO₂ as a chief lubricant on a bitterly cold world. He describes many swings in the conceptions of Mars, from Percival Lowell and his predecessors (who favored an inhabited world) to the lichen-covered desert of the 1950s, the dead Moon-like planet revelations of Mariner 4, the once-habitable world of Jonathan Eberhart’s post-Mariner 9 ballad “Lament for a Red Planet” (the one pertinent cultural reference missing from this book), the lifeless, dry, cold post-Viking paradigm of modern-day Mars, the “bugs on Mars” excitement of 1996, and on through today. Kargel believes, as would most Mars researchers after seeing the Mars Observer Mars Orbital Camera images and especially after Opportunity’s wanderings amid the “blueberries” on Meridiani Planum, that Mars once was and, in some ways, still is, not only a geologically complex and alive planet but also a potential past/present/future abode for life. Much of astrobiological interest may, as for Europa, lie too deep for easy access by machines. But there are reasons to pursue the quest. Kargel appropriately de-emphasizes the erstwhile micro-fossils in Allan Hills 84001, but later sections of his book provide a rich context for contemplating future exploration of the Red Planet and associated searches for extraterrestrial life.

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