BOOK REVIEWS

***The Institutions of Extraterrestrial Liberty*, edited by Charles S. Cockell (Oxford, Oxford University Press, 2022). Pp. xvi + 504. ISBN 978-0192897985 (hardback), 168 x 231 mm. US$ 130.00**

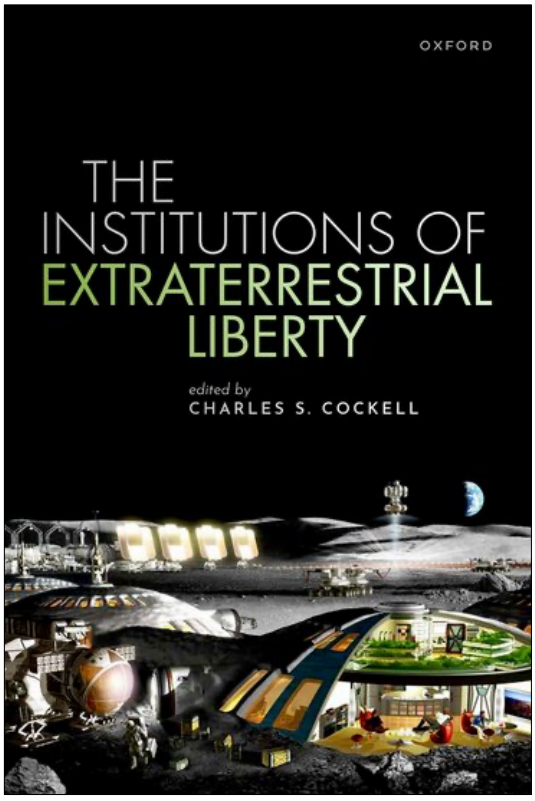
***Sovereign Mars: Transforming Our Values through Space Settlement*, by Jacob Haqq-Misra. (Lawrence, Kansas, University of Kansas Press, 2023). Pp. xii + 288. ISBN 978-0700633906 (paperback), 155 x 229 mm. US$ 29.95**

Assuming historians of astronomy are interested in all things having to do with space, these two volumes should prove enlightening, if somewhat off the beaten path. One is edited by Charles Cockell, a Professor of Astrobiology at the University of Edinburgh, and the other is authored by Jacob Haqq-Misra, an astrobiologist and research scientist associated with the Blue Marble Space Institute of Science. Both volumes converge on the same problem: governance structures once humans settle in space.

Cockell's book consists of 30 chapters based on a four-day conference held virtually (due to the pandemic) from June 8 to 11, 2021, hosted by the UK Centre for Astrobiology. The authors range from experts in the space sciences to philosophers, ethicists, and legal scholars. The topics, while centered on the concept of liberty, are very broad, ranging geospatially from the Moon and Mars to multi-generational worldships; thematically from ethical arguments for and against space settlement to the legal rights of robots in space and securing the peaceful use of outer space; and chronologically from the history of international governance treaties to the so-called 'Artemis Accords', now under negotiation between NASA and its international partners involved in the program to return humans to the Moon. In terms of approaches a good deal of analogy is employed throughout the book, including the editor's own essay on the history of the Scottish Islands and its relevance to extraterrestrial governance, as well as chapters that discuss governance of the Antarctic and similar situations of isolation.

To the editor's credit, two chapters (9 and 13) deal in detail with the risks of space expansionism, in particular reacting to Daniel Deudney's (2020) recent thought-provoking book *Dark Skies: Space Expansionism, Planetary Geopolitics, and the Ends of Humanity* (Oxford University Press), which argues that expansion into space will lead to interplanetary conflict, hierarchical world government, and the destruction of the environment around Earth in the form of orbital debris. While admitting the dangers, space scientist Ian Crawford argues that rather than quarantining ourselves on Earth and throwing away our future in space,

> … we should identify, and implement, institutional innovations that will allow space expansion to proceed while minimizing the attendants risks. (p. 131).



And in what is in my view one of the best chapters in the volume, Allan McKenna from the School of Law at the University of Glasgow also argues against Deudney, and concludes that space ventures, well managed, will improve our lives and that

> … we should not presume that the worst aspects of history shall prevail over the admirable qualities of the human character. (p. 207).

Call me an optimist, but I agree.

If one accepts space expansionism as a good thing, the next question is how to manage it, and in particular how to govern under certain conditions of space settlement. As one might expect, several chapters deal with the Moon (19 and 27) and Mars (8 and 16),

the nearest celestial objects most likely to be first settled. Chapter 27 by Frans von der Dunk, a Professor of Space Law at the University of Nebraska affiliated with the International Institute of Space Law, lays out the scenarios of increasing complexity that would apply to either Moon or Mars settlements. A single nation with only its nationals arriving at a settlement might just apply its same state laws on liberties. If a number of spacecraft from a single state arrive with many different nationalities things become more complex. And if spacecraft from many different nationalities are involved, a new legal order may be necessary. The Artemis accords now under negotiation (Chapter 19) demonstrate some of the embryonic difficulties of agreeing to such regulations. As von der Dunk concludes, in what is surely a massive understatement, balancing law and liberties

> … will require very thoughtful adaptation of legal concepts, principles, rules, rights, and obligations to that strange and dangerous environment. (page 472).

As one moves to increasingly more distant locations, the connections to Earth become more tenuous, and the potential for rivalries more intense. The science fiction television series *Expanse* has imaginatively played out possible conflict scenarios in a colonized solar system. Science fiction scenarios are liberally sprinkled throughout the volume, especially novels on Mars such as Kim Stanley Robinson's iconic trilogy *Red Mars, Green Mars*, and *Blue Mars* (Chapter 12).

In the end there is little consensus about governance structures and the elements of liberty in this volume. But that is not the point. The point is to contemplate the problems, lay out the options, and prepare the way before the problems happen, hopefully resulting in the most beneficial outcomes. This is a delightful goal, but as we all know, humans being human, the best laid plans often go awry.

Among the chapters that will be of special interest to readers of this journal is Lucas Mix's essay on what he calls 'ascent narratives' in astronomy and biology, by which he means not only narratives emphasizing ascending rocket launches and progressive biological evolution but also ideas embracing a tendency toward greater complexity in astronomy, biology, and culture. Clearly, we have cosmic, biological, and cultural evolution, although few are suggesting they tend toward some teleological purpose. Mix (an astrobiologist and episcopal priest) finds the idea of increasing and progressive complexity dangerous, at least coming from science. He traces the history of the idea and argues that spaceflight and science in general remain associated with narratives of ascent, development, and salvation in secular terms. For spaceflight, he says, "The steps are clear: science, radio-telescopes, Moon colony, Mars colony, interstellar travel, and galactic expansion" (248). This is indeed the worldview of many of the authors in this volume. Mix does not really seem to be arguing against spaceflight itself, but against spaceflight expansionism as inevitable or desirable, in line with Deudney. He charges that people like J.D. Bernal (Bernal, 1929) Carl Sagan (Sagan, 1979) and myself (Dick, 2003), are, through their writings, attempting to "… maintain the developmental expectations and salvific power of science." (page 249). He concludes that

> … to complete the Copernican revolution we must decouple spaceflight and physical elevation from narratives of spiritual ascent and developmental progress. (page 249).

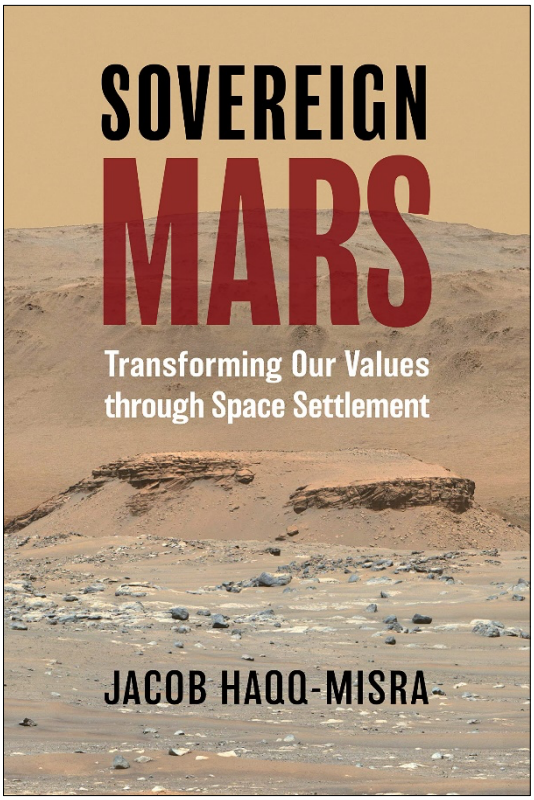
Apparently he wishes to keep human destiny under the purview of theologians, thus affirming what has been called 'the naturalistic fallacy', the fallacy being the idea that science can contribute to matters of value and human destiny. To which some might respond, what about the supernaturalistic fallacy? (Dick, 2018; 2023). In my view, and many others, whatever one's supernatural predilections, human destiny may also be linked to the cosmos (Dick, 2009). In his recent volume *Cosmological Theories of Value,* for example, NASA engineer and astrophilosopher Mark Lupisella places cosmic evolution at front and center stage, arguing that human destiny is intimately connected to the cosmos and cosmic evolution (Lupisella, 2020). This view is also gaining acceptance among some theologians (Davis, 2020).

The 30 chapters of this volume would have profited from a better arrangement that would have given some structure to the book. The editor—like all editors—admits to struggling with this problem, in this case whether to arrange chapters, for example, geospatially from Earth orbit to interstellar space, or thematically by legal, scientific, and philosophical problems. In the end, finding that many of the articles had multiple themes and geospatial concerns, he has opted to arrange the articles in alphabetical order by author,

possibly the first book I have seen do this, with the result that there is no structure to the book at all. This is to be regretted, but it does not detract from the value of many of the articles considered individually. It is left to the reader to compare, contrast, and synthesize. Also, regrettably, the volume lacks an index, which would have been very useful in such a wide-ranging book. If one wants to know where 'Sagan' or 'science fiction' or 'Mars' are discussed in the volume, the reader must read all 504 pages. The bottom line, however, is that it is inspiring to see such an interdisciplinary group of scholars, including those in the social sciences and humanities, deeply engaging in real-world issues in coordination with scientists. Many such conferences are now being held regularly, often under the auspices of astrobiology (Dunér et al., 2013; Kelly, 2019), and it is hoped these will prove useful as humanity permanently moves further into outer space. Deudney notwithstanding, this seems almost inevitable, so it is prudent to consider the issues well in advance.

Haqq-Misra's book is focused on Mars and is therefore much more coherent within its limited purview. And it has a comprehensive index. In his search for future options for governing Mars settlements, the author first offers three justifications for why we should live in space: exploration for science and resources; mitigation against catastrophic risks to Earth such as climate change, nuclear war, asteroid impacts, pandemics, and malevolent artificial intelligence; and the pursuit of transformative value to individuals and civilization that accompanies settling new worlds. He then gives a history of sovereignty on Earth, from the Roman Empire and Catholic church to the medieval order of divine right, sovereignty derived from the consent of the people, the sovereignty of nation states, the United Nations, and international law. This serves as background to chapters discussing three precedents that might prove useful for Mars: the Outer Space Treaty of 1967, the Law of the Sea applicable to maritime activities, and the Antarctic Treaty.

Chapters 6 and 8 provide two models for governing Mars settlements, dubbed 'Cooperative Sovereignty' and simply 'Sovereign Mars'. The former is based on a first possession principle using an analog with maritime law, with other areas of Mars preserved as planetary parks. In the latter model Mars is a sovereign and independent agent. Haqq-Misra does not choose between these two models and allows that other models are possible. He is not sanguine about the difficulties of life on Martian settlements or about getting nation states to agree on any model. He even remains agnostic about whether we should develop permanent settlements on Mars. Nor is he sanguine about how Mars settlements could survive over generations, offering 'deep altruism' as one possible motive. In the end the book is a laudable and even-handed attempt to set out options for Mars governance, a significant contribution to the sparse literature on the societal implications of space exploration.



Taken together, these two volumes explore issues that are now upon us and may lead to policies that need to be implemented within a decade. The stakes are high at a planetary level, not just for the Moon and beyond, but also for the Earth itself.

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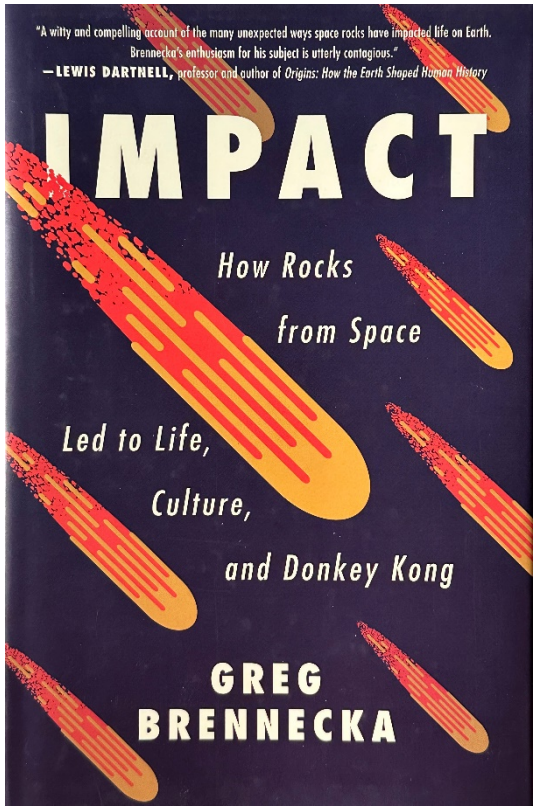
***Impact: How Rocks from Space Led to Life, Culture, and Donkey Kong*, by Greg Brennecka. (New York, William Morrow, 2022). Pp. 292. ISBN 978-0-06-307892-5 (hardback), 155 × 235 mm, US$28.99.**

As one can discern from the subtitle, this is not an entirely serious book, even though it is written by a cosmochemist at Lawrence Livermore National Laboratory. Dr Greg Brennecka has given us a book about meteorites that is a slap dash of American cultural asides (Jar Jar Binks, Jimmy Fallon, Donkey King, and the film *Independence Day*, to name a few) and serious science. The nonsense extends to the diagrams, which includes in one case a juxtaposition of the cover of *The Gentleman's Magazine* from July 1796 with the front cover of GQ magazine featuring a bikini-clad woman and an enlargement of some front cover text of a prurient nature.

If one can ignore all this, which is difficult, the text does offer a fine survey of meteorite knowledge from ancient times to the present. He starts with "… small rusted meteorite beads found in a grave dating around 4000 B.C.E. at Tepe Sialk in modern-day Iran …" (p. 54) as the earliest known human-meteorite contact. The better-known use of meteoritic iron to create a blade for Egypt's King Tut is also discussed and illustrated, as are Chou dynasty dagger and axe-heads from around 1000 BCE in China.

In one welcome and notable nod to British cultural life, Brennecka writes



> As we all know from watching decades of James Bond movies, most things of consequence in this world either occur on British soil, or feature someone with a posh British accent. This stands true in the history of meteoritics. (p. 105).

On 13 December 1795 several farmers in Yorkshire saw a spectacular meteorite fall. The closest person to the fall was John Shipley at Wold Cottage, which is now the site of "The world's only monument erected at the fall location of a meteorite." (p. 108). The man who owned the land where it fell, Captain Edward Topham, wrote a report