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## Book Review

***Dark Skies: Space Expansionism, Planetary Geopolitics, and The Ends of Humanity* by Daniel Deudney (Oxford University Press, 2020) 443 pages.**

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In this important and thought-provoking book, the international relations scholar Daniel Deudney provides a panoramic survey of diverse schools of thought relating to the future of human activities in space, and provides a systematic attempt to assess their relative merits. The discussion is framed in the wider context of global problems faced by our contemporary planetary civilization, and the risks and benefits of technological choices. There is more detail and nuance in these arguments than I can do justice to here, but, on my reading, the essence of book amounts to a detailed critique of what Deudney sees as overly optimistic visions of a human future in space.

Deudney coins the term ‘space expansionism’ for the ideology that an expansion of human activities into space is desirable and inevitable. Within the overall context of space expansionism, he identifies three quasi-independent strands, which he terms ‘military space expansionism’, ‘habitat space expansionism’, and ‘planetary security space expansionism’ (p. 30). He identifies these three strands with the names of Wernher von Braun, Konstantin Tsiolkovsky, and Arthur C. Clarke and Carl Sagan, respectively. I’m personally doubtful that the views and legacies of these very different advocates for a human future in space can be so easily pigeon-holed, although I do agree with Deudney that von Braun’s early involvement with Nazi Germany’s war effort, and later advocacy of US military space projects, is deeply problematic, whereas Clarke and Sagan both had much more peaceable and inclusive visions of space exploration that deserve to be celebrated.

Deudney’s treatment of military space expansionism is, at least to my mind, uncontroversial. It is a historical fact that the development of rockets and other space capabilities have been intimately connected with military activities, and space technologies continue to have many military applications. As Deudney stresses, near-Earth space is already heavily militarized, and the recent creation of a US ‘Space Force’, with the corollary that space can now viewed as a

‘warfighting domain’,<sup>1</sup> only underscores the dangers of further military space expansionism. Deudney is right to draw attention to these dangers and to call for mitigation measures. That said, it isn’t clear how space militarization can be prevented without significant developments in global governance sufficient to curtail the currently anarchic relationships between nation-states. Grappling with this issue is central to engaging with Deudney’s arguments, and I’ll return to it below.

Similarly, Deudney’s advocacy of planetary security space expansionism, calling as it does for the increasing use of space technologies to monitor compliance with international environmental and arms control agreements, and, if necessary, to protect Earth from asteroid impacts, appears eminently sensible. Moreover, although science isn’t explicitly included in the names of any of the three ‘space expansionisms’, Deudney places space science investigations in this category and argues that they should be continued, and indeed expanded. Finally, and this will become important later, Deudney places what he calls ‘Whole Earth Identity’ formation in this planetary security category. This refers to the important idea, suggested by multiple authors over the years, that by increasing the ease of global communications, and by providing images of the Earth in its cosmic context, space activities may help trigger a greater sense of global identity, which in turn may help reduce international tensions and thus enhance prospects for global peace and security. All of these ‘planetary security’ applications of space technology are beneficial, and continued development of these capabilities would seem to be positively desirable.

From the point of view of space advocates (and here, with some caveats, I include myself), the most controversial aspect of Deudney’s analysis is likely to be his critique of habitat space expansionism. Within this category Deudney includes schemes for human colonisation of other planets, the mining of the Moon and asteroids for raw materials, and the construction of large-scale infrastructures in space. He concludes that some aspects of these activities will be as dangerous for the future of humanity as military space expansionism, and perhaps more dangerous in the long-term. Among the potential risks he identifies are: the possibility of conflict arising out of competition for space resources (exacerbating the risks of near-term military space expansionism); the possibility of armed conflict occurring between human colonies, and between these colonies and the Earth; the deliberate alteration of asteroid orbits, raising the spectre of asteroid impacts being used as weapons of mass destruction; and, in the more distant future, the possibility that human colonists in space might eventually evolve into post-human forms that would have little in common with humanity and might even cause our extinction. Additionally, Deudney is concerned that political interactions between multiple extraterrestrial colonies (comprising what he calls ‘a solar archipelago’), and between these colonies and the Earth, may encourage the evolution of totalitarian forms of government (of which more below).

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<sup>1</sup> The Future of Space 2060 and Implications for U.S. Strategy: Report on the Space Futures Workshop, Air Force Space Command. <https://aerospace.csis.org/wp-content/uploads/2019/09/Future-of-Space-2060-v2-5-Sep.pdf>.

Deudney argues that these potential outcomes are so dangerous that humanity should refrain from engaging in habitat space expansionism and should ‘relinquish’ the relevant capabilities. He defines ‘relinquishment’ as “completely forgoing a technology or activity” (p. 139), and some examples of activities to be relinquished (including the colonisation of Mars and asteroids, and the construction of large space infrastructures) are tabulated (p. 372). Although, at first glance, this would seem to imply that humanity should *forever* refrain from these activities, Deudney<sup>2</sup> has indicated that this was not his intention, pointing to his explicit recognition (p. 364) that “[i]n the very long term, humanity must leave the Earth to survive.” Rather, it appears that his view is that we should not engage in habitat space expansionism for “at least the next several centuries,” by which time we may have found solutions to multiple other existential threats and be in a better position to expand into space should there then be reasons for doing so.

Regardless of the timescale, I am in complete agreement with Deudney that an unregulated, anarchic, expansion into space would be fraught with danger and must be avoided. However, I also think that relinquishing many of the activities that Deudney identifies as ‘habitat space expansionism’, even if ‘only’ for several centuries, could significantly impoverish humanity’s future. For all we know, by waiting this long, in the hope that we will by then have solved all our other problems, we may miss a narrow window of opportunity to gain a foothold in the Solar System upon which, as Deudney himself acknowledges, our ultimate survival may depend. Deudney is suspicious of the popular, and at first sight common-sense, argument that our long-term future will be more secure if all our eggs are not kept in a single planetary basket, because he sees the existential risks of space anarchy outweighing any likely benefits for survival. I suspect that Deudney is right about this – if we cannot curtail interplanetary anarchy, the probability that a malign actor in space may deliberately target a large asteroid to hit the Earth is almost certainly greater than that of a civilisation-destroying natural meteorite impact occurring within the next few centuries. Still, even while acknowledging the attendant risks, it may be that keeping open our long-term options in space will confer survival advantages.

Moreover, we cannot simply ignore (as I think Deudney largely does) the scientific and cultural opportunity costs of refraining from expanding into space. Human expansion into the Solar System, and perhaps one day beyond, seems likely to offer significant potential for discovery and intellectual enrichment on multiple scientific, philosophical and cultural levels.<sup>3</sup> We therefore need to ask ourselves: Which will be the richer future for humanity in the coming centuries, one in which we remain confined to Earth, or one which includes expansion out into the Universe around us? In any case, I think we may have to accept that many of the activities that Deudney identifies as habitat space expansionism are likely to happen anyway in the coming centuries, regardless of academic arguments that may be made for or against them,

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<sup>2</sup> Personal communication, 28 April, 2022. I would like to take this opportunity to thank Professor Deudney for his helpful comments on an earlier draft of this review, which isn’t to imply that he agrees with everything in it!

<sup>3</sup> There isn’t space to fully justify this assertion here; my own view is elaborated in: Crawford, I.A. (2014) [Avoiding intellectual stagnation: The starship as an expander of minds](#), *Journal of the British Interplanetary Society*, 67, 253-257.

owing to the sheer strength of governmental and private interests already pushing in this direction. Rather than trying to hold back the tide, it may be better to prepare the institutional infrastructure that will enable humanity safely to expand into space while minimising the attendant geopolitical risks.

The nearest term possibilities would involve strengthening United Nations oversight of space activities. This could be achieved by building on the existing provisions of international space law, most notably the Outer Space Treaty of 1967<sup>4</sup> and the (currently undersubscribed) Moon Agreement of 1979.<sup>5</sup> Deudney favours this approach as part of what he calls a ‘Whole Earth Security Program’ (e.g., pp. 225, 241), but he clearly doesn’t believe that measures of this kind will be sufficient to cope with the larger risks of interplanetary anarchy that he associates with habitat space expansionism. A more ambitious step in this direction might be to take up the proposal for a UN Space Agency, as advocated (among others) by Grenville Clark and Louis Sohn in the second edition of their seminal work on UN reform: *World Peace Through World Law*.<sup>6</sup>

Ultimately, however, the only way to avoid anarchy, on Earth or in space, is through some form of government. Of course, Deudney is fully aware of this, having published an earlier much-admired study, *Bounding Power*,<sup>7</sup> which has the problem of achieving an acceptable balance between anarchy and despotism in international relations as its central theme. Elsewhere, Deudney has advocated world government as a means of addressing pressing global problems,<sup>8</sup> always with the caveat that a global tyranny must be avoided. Following the example set by the US Constitution, Deudney’s preferred solution to this conundrum would be to ensure that any future world government would be ‘federal-republican’ in nature, where individual citizens would be represented at the state and federal levels, and where checks and balances between the various levels of a federal world government would minimise the risk of one level usurping totalitarian control. This isn’t the place to discuss the pros and cons of various proposals for world government, but my own view is that some form of world government probably will be required if humanity is to satisfactorily address the many global problems requiring attention as the 21<sup>st</sup> century unfolds, and I agree with Deudney that a federal structure would be the most appropriate.

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<sup>4</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies;

<https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>

<sup>5</sup> Agreement Governing the Activities of States on the Moon and Other Celestial Bodies;

<https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html>

<sup>6</sup> Clark, G. and Sohn, L.B. (1960). [\*World Peace Through World Law\*](#). Second revised edition, Harvard University Press, Cambridge, MA, USA.

<sup>7</sup> Deudney, D.H. (2007) *Bounding Power: Republican Security Theory from the Polis to the Global Village*, Princeton University Press, Princeton, NJ, USA. I think it would be worthwhile for anyone interested in following the arguments in *Dark Skies* to first read *Bounding Power*.

<sup>8</sup> See, for example: Deudney, D.H. (2018) All together now: Geography, the three cosmopolitanisms, and planetary Earth. In L. Cabrera, (ed.) *Institutional Cosmopolitanism*, pp. 253-276. Oxford University Press, Oxford, UK.

Building on an argument developed in *Bounding Power*, one of Deudney's main objections to habitat space expansionism is a concern that the existence of human colonies in space may lead a benign, non-totalitarian, world government to become totalitarian in a way that would not happen otherwise. The central idea is that if humans do not expand into space there will be no (human-caused) external threats to Earth, and therefore no pressures on a future world government to become totalitarian in order to resist them. As Deudney writes (p. 308), "barring substantial space colonisation or threatening aliens, a world polity would be alone and thus not need to mobilize, concentrate, or employ violence capacity against outside threats." On the other hand, if "humanity expands into solar space, world government on Earth ceases to be a universal government and becomes one of many world governments" (p. 353), with attendant prospects for inter-world conflict and domestic repression.

However, it seems to me that this argument ignores the fact that any future world government will need to mobilize and concentrate *some* degree of central power to deal with the common threats that face humanity on our home planet, irrespective of whether there are any external threats to worry about. This is why many people fear that, even if desirable in principle, there is a risk that a future world government would eventually devolve into a global tyranny. To the extent that we will need to build institutions of global governance capable of solving existential problems on Earth,<sup>9</sup> this is a nettle that will need to be grasped regardless of whether humanity expands into space or not. Moreover, and this is important, if we *do* successfully develop strong, non-totalitarian (i.e., federal-republican) institutions of global governance here on Earth, then an extrapolation of these institutions will presumably be available to curtail anarchy and tyranny in space. This is especially true of federal forms of government because, as Montesquieu realised long ago,<sup>10</sup> and as demonstrated by the success of the US federal constitution, federal governments are inherently expandable over large spatial scales. Consider, in the current context, that the islands of Hawaii, isolated in the middle of the Pacific Ocean, might just as well be a colony on Mars as far as the US federal institutions are concerned.

To be fair, Deudney (p. 352) does recognize interplanetary federalism as a potential solution to the geopolitical problems of space expansionism, but then dismisses it as impractical (based on, as it seems to me, a rather forced analogy with failed attempts at federation within the British Empire). Importantly, and unlike Deudney's British Empire analogy, the evolution of any future federal world government is likely to occur on the same timescale, say over the next century or so, as space expansionist activities ramp up. Crucially, this raises the possibility that future space colonies might be integrated into a federal world government *from the start*, thereby nipping incipient interplanetary anarchy and tyranny in the bud. Note that the counter argument, that the Solar System is in some sense 'too big' for even a federal form of government, is easily discounted – elsewhere in *Dark Skies* Deudney employs the concept of 'effective distance' (defined in terms of the time it takes to communicate between different places given the technology available), and by this metric the whole Solar System is today far

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<sup>9</sup> For an excellent recent review of these issues, see: Lopez-Claros, A., Dahl, A. and Groff, M. (2020). *Global Governance and the Emergence of Global Institutions for the 21<sup>st</sup> Century*. Cambridge University Press, Cambridge, UK.

<sup>10</sup> Montesquieu, C. L. de S. (1748) *The Spirit of the Laws*, Bk. 9, Ch. 1

smaller than the area occupied by the original thirteen American states in 1787. To my mind, the relationships between world government, on which I think Deudney and I largely agree, and interplanetary government, which I felt deserved more attention in *Dark Skies*, is central to reconciling habitat space expansionism with a secure long-term future for humanity.<sup>11</sup>

Of course, at the present time, any talk of world government, never mind interplanetary government, is likely to appear Utopian. However, it is worth pausing for a moment to consider why this is so. A key reason why world government, even if acknowledged to be desirable in principle, is often seen as politically unrealistic is that humanity currently lacks a sufficiently strong sense of global community on which such an institution might be built.<sup>12</sup> As Deudney recognizes with his concept of Whole Earth Identity, space activities have the potential to help create a sense of planetary community by providing a cosmic perspective on human affairs. To this extent, Deudney's advocacy for the role of space activities in the formation of a Whole Earth Identity may partly subvert his geopolitical arguments against habitat space expansionism!

To conclude, Daniel Deudney's *Dark Skies* performs a hugely valuable service by raising important, and often neglected, geopolitical considerations related to the future of human activities in space. It deserves to be read by anyone with an interest in the future of space exploration. Where I part company with some of Deudney's conclusions is that, rather than turning our backs on a potentially vast future for humanity in the cosmos, I think we should instead work towards the evolution of stronger political institutions, up to and including planetary and interplanetary government, sufficient to mitigate the geopolitical dangers that he identifies, both on Earth and in space.

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<sup>11</sup> I have expanded on this argument elsewhere: Crawford, I.A. (2015) [Interplanetary federalism: Maximising the chances of extraterrestrial peace, diversity and liberty](#). In C. Cockell, ed., *The Meaning of Liberty Beyond Earth*, pp 199-218. Springer, Cham, Switzerland.

<sup>12</sup> It is interesting in this context that the anthropologist Douglas Fry identifies "an overarching social identity" as one of the key criteria for intersocietal peace, and this is something that humanity as a whole currently lacks; Fry, D.P. (2012) Life without war, *Science*, 336, 879-884.