

RESEARCH ARTICLE

Before astropolitics: Ratzel, Schmitt, and the question of cosmic colonisation

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Abstract

This paper seeks to open an inquiry into the origins of astropolitics, an intellectual and popular imagination whose defining characteristic is the attempt to project geopolitical concepts and categories into outer space. I locate the roots of this vision not merely in Anglo-American maritime strategy but in the rather earthlier German tradition of geopolitics, more specifically in the work of the geographer Friedrich Ratzel and the political theorist Carl Schmitt. Surprisingly, however, my reverse chronology discovers that although the two men's ideas reverberate through contemporary astropolitical discourses, they were both in fact, in different ways and for different reasons, hesitant about space colonisation. The paper makes sense of this finding and unpacks its implications for contemporary International Relations debates on off-earth politics.

Keywords: astropolitics; living space; planetarity

Out of the cradle

Space war was once the remit of army personnel, security analysts, and members of the intelligence services. Although it has long been known that modern armies rely on satellite imagery, and that most wars since the first Gulf War have in that sense been space wars, we have only recently witnessed increased public attention on astropolitics, the projection of geopolitics into space. Two developments have fuelled this rising interest. The first is the accelerated growth of the commercial space sector, which in 2023 was reported to be worth \$546 billion and projected to grow by 41 per cent over the next half decade.¹ SpaceX's founder and CEO Elon Musk has promised to further cut space transportation costs and eventually colonise Mars, creating new forms of authority beyond the confines of earthly law. In the visions of a new generation of billionaire space barons, the cosmos emerges as a place where humans can escape their dying planet and rescue the project of limitless growth.²

The second concerns the 2022 Russian invasion of Ukraine. The rollout of SpaceX's Starlink broadband over Ukraine has been widely reported as crucial to the war effort. But as the global media were flooded with high-quality satellite imagery of exploding Russian tanks, questions were raised over whether SpaceX had been geofenced so as not to support any offensive actions in territories that were held by Russia at the time of the invasion, particularly the Crimean peninsula. On top of this, there is a growing concern about what Russia and China might be launching into orbit. In January 2024, *The Economist* warned its readers that 'war in space is no longer science

¹The commercial space industry, led by Elon Musk's SpaceX, is expected to blast off with 41% growth over the next 5 years, *Fortune* (24 July 2023), available at: <https://fortune.com/2023/07/24/space-industry-revenue-growth-five-years/>.

²Mary-Jane Rubenstein, *Astrotopia: The Dangerous Religion of the Corporate Space Race* (Chicago: University of Chicago Press, 2022).

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fiction.³ Two weeks later, the chair of the US House intelligence committee asked the US president to declassify information about a mysterious new Russian space weapon. Soon, the global media landscape was flooded with speculation about Moscow's new technology and how it might alter the global balance of power.

These events are clearly related. And yet, they also highlight different facets of the space age 2.0: space is not just a sphere of economic opportunity, colonisation, and salvation – but also a source of great anxiety. For those searching their newsagent or bookstore for a guide to this brave new space world, there is *The Future of Geography*, written by the former British war journalist turned popular author Tim Marshall. The book is part of his *Prisoners of Geography* franchise which has sold millions of copies and includes a children's book edition. It also comes with a foreword from a former chief of the UK's foreign intelligence service. Marshall's story on outer space is neither convoluted nor indeed new to those familiar with discourses of the first space age: as human life is genetically programmed to be restless, humans constantly seek to move and migrate, explore, and conquer. But sadly, the earth's resources and terrestrial space are limited. It is thus that humanity needs to expand into the solar system and beyond.

We discovered the earth and found it is finite. Now, just as our territory and resources begin to run out, we find that the big, beautiful ball in the sky – the Moon – is full of the minerals and elements we all need. It's also a launchpad: just as the early humans went from island to island, so the Moon will allow us to reach across the solar system and beyond.⁴

And although some might dispute Marshall's confidence in the benefits of lunar extraction, there is nothing new or remarkable about his cosmic daydream. It synthesises what is already in a media sphere oversaturated with stories about the new US Space Force, Indian and Russian moon landings, Chinese anti-satellite warfare, and plans for the establishment of Martian colonies.

Perhaps even more than Marshall's earlier books, *The Future of Geography* is targeted at a male audience with an interest in off-earth militarism, space expansionism, and cosmic escapism. It is written for men who see in Elon Musk a visionary, men who want to realise their boyhood dreams, regardless of the amount of rocket fuel that this would take. Despite all the talk of asteroid mining, space weapons, lunar bases, and interstellar travel, there are earthlier themes in Marshall's space book, which will be familiar to those acquainted with the wider genre of geopolitical writing. Here is a story of great powers operating under the inevitable influence of environmental constraints, the slow force of geologic and climatic agency. But his cosmic journey introduces something new, namely the assumption, and it is an assumption rather than an argument, that outer space is 'an extension of the geography of Earth.'⁵ Much else depends on this, most notably Marshall's vision of outer space as one which will naturally be as divided and conflictual as terrestrial space.

Marshall sees little shame in marching into politically perilous territory. Like others who draw on geopolitics, he likes to invoke the heartland theory of Halford Mackinder, a geographer on whose 1899 expedition to Mount Kenia eight Indigenous porters were executed. By using antiquated theories to make sense of a cosmic future, he achieves an act of retrofuturism. And he is not alone. He has landed his intellectual spaceship in the expanding field of astropolitics, a genre of knowledge which spans applied military strategy, academic work, and popular non-fiction, and which confidentially projects 19th- and early 20th-century geography into outer space.

This paper is driven by a curiosity about the origins of the idea that outer space can and should be thought about in geographic and indeed geopolitical ways. The term geopolitics was coined in the early 20th century by the Swedish political scientist Rudolf Kjellén as a shorthand for the political

³'War in space is no longer science fiction', *The Economist* (31 January 2024), available at: {<https://www.economist.com/international/2024/01/31/america-china-and-russia-are-locked-in-a-new-struggle-over-space>}.

⁴Tim Marshall, *The Future of Geography: How Power and Politics in Space Will Change Our World* (London: Elliott and Thomson, 2023), p. xi.

⁵Ibid.

geography of the settler colonial enthusiast Friedrich Ratzel, whom Kjellén admired.⁶ Ratzel's political geography emphasised the environmental bedrock on which state formation and competition took place, and the ways in which geology and climate conspired to shape the fate of individual polities. Whilst there were arguably precursors,⁷ it was only in the 1890s that geography, organicism, and Darwinism were fused into a political theory which read states as organisms whose struggle for survival was in fact a *struggle for space*.⁸

Debates on International Relations (IR) have witnessed a growing interest in geopolitics. Indeed, recent and ongoing research has exposed the key – but long forgotten – role which geographers and geopoliticians played in advancing debates in IR before after the Second World War.⁹ And whilst much of this research is historically motivated, there is clearly contemporary relevance. Many have documented the revival of geopolitics as a vehicle for the critique of liberal order.¹⁰ Others are examining geopolitics as a guide to the climate crisis and an obstacle to effective action on global warming.¹¹ There is, in other words, a growing consensus that geopolitical ideas have not just shaped the interstate system and the way in which we think about it, but that geopolitics holds the world back from tackling the most pressing issues of our time.

One area which has thus far received much less attention, though it is clearly connected to all of the above, is the renaissance of a colonial geopolitics in the sphere of off-earth political thought and military strategy. Given the centrality that post- and decolonial critique has played in the analysis of outer space activity,¹² this lacuna is perhaps a little surprising. To be clear, there exist critiques of key astropolitical texts which do interrogate the latter's colonial nature.¹³ But whilst there are vast literatures on the history of the space race, space weapons, space programmes, space law, science fiction, as well as studies on the role of extra-terrestrials in political theory and philosophy, an intellectual history of astropolitics – thus of the attempt to launch geopolitics into outer space – is yet to be written.¹⁴ The study which comes closest is Daniel Deudney's 2020 epic *Dark Skies*, a passionate critique of space expansionism in its various guises. Deudney begins to draft an intellectual

⁶Sven Holdar, 'The ideal state and the power of geography: The life-work of Rudolf Kjellén', *Political Geography*, 11 (1992), pp. 307–23 (p. 319).

⁷Ladis Kristoff, 'The origins and evolution of geopolitics', *Conflict Resolution*, 4 (1960), pp. 15–51.

⁸Thinkers such as Halford Mackinder and Alfred Mahan were later added to form what is known today as the geopolitical tradition. In the United States, Ellen Churchill Semple and Isaiah Bowman took forward Ratzel's ideas. In Germany, it was the Nazi sympathiser Karl Haushofer.

⁹Lucian M. Ashworth, 'Realism and the spirit of 1919: Halford Mackinder, geopolitics and the reality of the League of Nations', *European Journal of International Relations*, 17 (2010), pp. 279–301; Lucian M. Ashworth, 'Mapping a new world: Geography and the interwar study of international relations', *International Studies Quarterly*, 57 (2013), pp. 138–149; Jean-François Drolet and Michael C. Williams, 'The radical right, realism, and the politics of conservatism in postwar international thought', *Review of International Studies*, 47 (2021), pp. 273–93.

¹⁰Stefan Auer, 'Carl Schmitt in the Kremlin: The Ukraine crisis and the return of geopolitics', *International Affairs*, 91 (2015), pp. 953–968; Stefano Guzzini, *The Return of Geopolitics in Europe?* (Cambridge: Cambridge University Press, 2012); Marlene Laruelle, 'The three colours of Novorossiia, or the Russian nationalist mythmaking of the Ukrainian crisis', *Post-Soviet Affairs*, 32 (2016), pp. 55–74; Vibeke Schou Tjalve, *Geopolitical Amnesia and the Crisis of Liberal Memory* (Montreal: McGill-Queens University Press, 2020).

¹¹Simon Dalby, 'Firepower: Geopolitical cultures in the Anthropocene', *Geopolitics*, 23 (2018), pp. 718–742; Gerard Toal, *Oceans Rise, Empires Fall: Why Geopolitics Hastens Climate Catastrophe* (Oxford: Oxford University Press, 2024).

¹²Peder Anker, 'The ecological colonization of space', *Environmental History*, 10 (2005), pp. 239–67; Bakawa Country, 'Dukarr Lakarama: Listening to Guwak, talking back to space colonization', *Political Geography*, 81 (2020), pp. 1–10; Alice Gorman, 'The landscape of interplanetary space', *Journal of Social Archaeology*, 5 (2005), pp. 85–107; Haris Durrani, 'Is space-flight colonialism?', *The Nation* (2019), available at: <https://www.thenation.com/article/world/apollo-space-lunar-rockets-colonialism/>; Rubenstein, *Astrotopia*.

¹³Oliver Dunnett, 'Geopolitical cultures of outer space: The British interplanetary society, 1933–1965', *Geopolitics*, 22 (2017), pp. 452–73; Raymond Duvall and Jonathan Havercroft, 'Critical astropolitics', in Natalie Bormann and Michael Sheehan (eds), *Securing Outer Space* (London: Routledge, 2009), pp. 42–58; Julie M. Klinger, 'Environmental geopolitics and outer space', *Geopolitics*, 26 (2021), pp. 666–703; Fraser MacDonald, 'Anti-Astropolitik: Outer space and the orbit of geography', *Progress in Human Geography*, 31 (2007), pp. 592–615.

¹⁴Dunnett offers a history of the British Interplanetary Society which pays attention to geopolitics, but this is geopolitics in the wider sense of the word not in the sense of the intellectual tradition. Dunnett, 'Geopolitical cultures of outer space'.

history but prioritises constructing a typology of different arguments around space colonisation.¹⁵ Like others before him,¹⁶ he relates space expansionism to German living-space thinking. What space expansionists fantasise about is, for Deudney, ‘the distribution of humans and their machines throughout the outer solar system and, eventually, across the vast voids of interstellar space to a *Lebensraum of galactic proportions*’.¹⁷ With some using the language of habitat expansion and living space freely,¹⁸ and others acknowledging their debt to a German tradition of geopolitical thinking,¹⁹ Deudney is clearly onto something.

This paper picks up this thread. It does so by travelling backwards in time, offering a reverse chronology which exposes earlier, unexpected, and now forgotten layers of astropolitical debate. Rather than presenting a comprehensive intellectual history of outer space in IR and political theory, it seeks to understand the entangled history of geopolitics and astro-strategy. I begin by discussing two of the foundational authors who established astropolitics as a genre and whose ideas echo through the current moment, Colin S. Gray (1943–2020) and Everett Dolman. The paper then proceeds to unpack the resonances between contemporary astropolitics and the thought of the German geographer Friedrich Ratzel (1844–1904) and the legal and political theorist Carl Schmitt (1888–1985), zooming in on the former’s understanding of growth and colonisation, and the latter’s conception of land appropriation and international law, respectively. I then examine Schmitt and Ratzel as astropolitical thinkers in their own right, revealing that neither of the two in fact endorsed space expansionism. Whilst Ratzel developed an esoteric panpsychist theory of cosmic evolution in the late 19th century, Schmitt sought to make a name for himself as a critic of the 1950s space race. I argue that the reason for this unexpected finding is to be located not at the level of ontology but in the analytical conservatism of geopolitics.

Dolman and Gray

Let us begin by peeling back the first layer of astropolitics. This entails travelling to a period of American triumphalism which begins with Reaganism and ends with the crisis of neoconservatism in the mid-2000s. Towards the end of this era, the figure of Everett Dolman comes into vision. An ex-NSA analyst who lectures at the USAF Air War College in Alabama, Dolman plays a crucial role in initiating astropolitics as a recognisable subfield of military strategy. His 2002 book *Astropolitik: Classical Geopolitics in the Space Age* is written as a practical guide to the ways in which outer space might be conquered and governed with geopolitical tools. It is a manual for how states, particularly the United States, should think about cosmic chokepoints and outstations, whether Washington should respect the Outer Space Treaty (the answer is no), and whether human settlements elsewhere in or outside our solar system might ensure species survival.

Humanity’s future is in the stars. Our indomitable will requires ever-greater challenges. Our insatiable appetites require vast new resources. Eventually we *will* fill this niche that is Earth and spill out into the cosmos.²⁰

Dolman, whom Marshall thanks in his acknowledgements, discusses ‘the common perception’ of how space colonisation is an evolutionary stepping stone which ensures humanity’s survival, either because of ‘overpopulation’, ‘wealth-maximisation’, or an ‘escape to another habitable planet

¹⁵Daniel Deudney, *Dark Skies: Space Expansionism, Planetary Geopolitics, and the Ends of Humanity* (New York: Oxford University Press, 2020), p. 177.

¹⁶Anker, ‘The ecological colonization of space’, p. 244.

¹⁷Deudney, *Dark Skies*, p. 10, emphasis added; see also p. 182.

¹⁸Namrata Goswami and Peter A. Garretson, *Scramble for the Skies: The Great Power Competition to Control the Resources of Outer Space* (Lanham, MD: Lexington Books, 2020).

¹⁹Everett C. Dolman, *Astropolitik: Classical Geopolitics in the Space Age* (London: Routledge, 2002).

²⁰*Ibid.*, p. 182.

before we ruin this one'.²¹ He speculates that 'strands of DNA with incubating material can be sent to every star conceivable', which he envisages as a 'broadcasting of spores'.²² In the context of these constraints, astropolitics to Dolman is 'the grandest strategy of them all', space the 'ultimate high ground', the latter a Cold War-era phrase repeated by Donald Trump in 2019.²³ And just as if to dispel any residual doubts about the colonial nature of his endeavours, Dolman reassures us that his space colonisers will be as ruthlessly suitable as those European settlers who populated America and Australia.²⁴ In 2016, he and three co-authors at the Air University urge Trump to 'make space great again'.²⁵

Dolman promises 'the extension of primarily nineteenth- and twentieth-century theories of global geopolitics into the vast context of the human conquest of outer space'.²⁶ Developing Mackinder's famous dictum on the Eurasian heartland, he continues: 'Who controls low-Earth orbit controls near-Earth space. Who controls near-Earth space dominates Terra.'²⁷ And yet the geopolitics of outer space is one which must leave Mackinder's earthly scales and analytics behind. For when seen from outer space, Dolman explains, the earth is smoother than a billiard ball. Topography effectively disappears behind a 'rich vista of gravitational mountains and valleys, oceans and rivers of resources and energy alternately dispersed and concentrated, broadly strewn danger zones of deadly radiation, and precisely placed peculiarities of astrodynamics'.²⁸ What matters to an understanding of this world is orbital mechanics, not geomorphology, geology, or climatology. Once this has been accepted, particularly desirable orbits and lines of travel come into vision, which states will desire to control.

Astropolitics has been explicit about its use of various imperial geopoliticians, including most notably the American naval strategist Alfred Thayer Mahan (1840–1914) and the aforementioned British geographer Halford Mackinder (1861–1947). Incidentally however, neither Mahan nor Mackinder have anything to say about outer space. The relationship of astropolitics to the imperial German tradition of geopolitics, which runs from the writings of the geographer Friedrich Ratzel via the Nazi sympathiser Karl Haushofer (whose work was largely derivative of Ratzel's) to the Nazi legal theorist Carl Schmitt, is more interesting, not least because it is here that spatial expansion is celebrated. Dolman acknowledges his debt to the deeply discredited tradition of *Geopolitik*, not least by naming the book *Astropolitik*.²⁹ And whilst this may seem like a curiously self-undermining move, Dolman is correct to flag the overlap. It is in *Geopolitik* that we find a biological-evolutionary worldview coupled with Malthusian principles, a naturalisation of war, and a fetishisation of the settler colony – which are neither present in Mahan nor fully in Mackinder. And whereas Anglo-American geopolitics has nothing to say about outer space, its German counterpart does. As we shall see, the latter approaches outer space in ways that subvert the central tenets of its theory.

Despite pledging allegiance to *Geopolitik*, Dolman does not make much reference to the texts of German geopolitical thinkers. When he does, the reader gets the impression that he has not read them.³⁰ Dolman does however draw on émigrés like the Austrian-born one-time advisor to Barry Goldwater Robert Strausz Hupé, who begins his 1942 book *Geopolitics: The Struggle for Space and Power* with a Ratzel epigraph and explores the German geographer's ideas in detail in a chapter

²¹ Ibid., p. 51.

²² Ibid., p. 52.

²³ 'Space Force: Trump officially launches new US military service', *BBC* (2019), available at: {<https://www.bbc.com/news/world-us-canada-50876429>}.

²⁴ See also MacDonald, 'Anti-Astropolitik'.

²⁵ Brent Ziarnik, Peter Garretson, Everett Dolman, and Coyote Smith, 'Dear President Trump: Here's how to Make Space Great Again', *Wired*, available at: {<https://www.wired.com/2016/12/dear-president-trump-heres-make-space-great/>}.

²⁶ Dolman, *Astropolitik*, p. 1.

²⁷ Dolman, *Astropolitik*, p. 8.

²⁸ Everett C. Dolman, 'Geostrategy in the space age: An astropolitical analysis', *The Journal of Strategic Studies*, 22 (1999), pp. 83–106.

²⁹ See especially Dolman, *Astropolitik*, pp. 3, 15, 51.

³⁰ Dolman turns the bourgeois geographer Friedrich Ratzel into an aristocrat by adding a 'von' to his last name.

titled ‘The discovery of space.’³¹ Dolman also invokes Nicholas Spykman, who is himself under the influence of Karl Haushofer and other German geopoliticians.³² Dolman’s reading of German geopolitics seems to resemble moreover that offered by the British military strategist Colin S. Gray, editor of the series in which Dolman’s book appears.³³ Like Dolman, Gray has links to the Air University. In the 1980s, the prolific author is known as a nuclear hardliner who advises US president Ronald Reagan on the Star Wars missile defence project and who expresses his willingness to sacrifice 20 million US citizens in a ‘winnable’ war against the Soviet Union.³⁴ In his published work from the early 1980s, Gray rails against arms control in outer space and warns that the very fear of a cosmic arms race might paralyse the United States.³⁵ He uses geopolitics to think through the logistics of entertaining a credible space force and to produce an inventory of things that might matter to outer space. It is in his writings that we read of space as ‘the highest of vantage points.’³⁶

Gray is not the first to transfer Mahanian ideas into outer space. A similar move has already been performed in broad strokes by David Lupton, a retired USAF officer for the Air University in the late 1980s,³⁷ although it should be noted that Gray has already brought Mackinder to bear on nuclear strategy a decade earlier.³⁸ Whilst Gray relies heavily on the key theorists of geopolitics when discussing nuclear weapons, his writings on space warfare remain technical and policy-focused. In the 2000s, Gray endorses Dolman’s text and makes extensive use of its maps.³⁹ To be clear, Gray, Lupton, and Dolman are not alone in theorising space warfare. There is a lively debate throughout the 1960s and 1970s on how to make sense of war in space and how the latter will play out.⁴⁰ But none of these earlier theorists see in classical geopolitics the answer to the questions posed by the space age.

What might we find if we try and peel back astropolitics further? Here, the picture becomes more frayed as a number of discourses come into focus, chiefly those of astrobiology and rocket science, but also narratives of manifest destiny – across fiction and non-fiction. In the 1950s, the Nazi turned American Cold War hero Wernher von Braun views humanity’s voyage into outer space as a mere extension of the European colonisation of the Americas. If the United States does not rise to the challenge, he warns, others will.⁴¹ He lobbies aggressively but unsuccessfully to receive funding to

³¹ Robert Strausz-Hupé, *Geopolitics: The Struggle for Space and Power* (New York: Putnam and Sons, 1942).

³² Nicholas J. Spykman, *America’s Strategy in World Politics: The United States and the Balance of Power* (New Brunswick: Transaction, 2007 [1942]), pp. 473–5.

³³ Both Dolman and Gray appear to be under the influence of Weigert et al.’s discussion of German geopolitics and Bowman’s distinction between a supposedly ‘legitimate’ Anglo-American school and its German counterpart. Colin Gray, *The Geopolitics of the Nuclear Era: Heartlands, Rimlands, and the Technological Revolution* (New York: National Strategy Information Center, 1977), pp. 19–20, 29–31; Hans W. Weigert, Henry Brodie, Edward W. Doherty, John R. Fernstrom, Eric Fischer, and Dudley Kirk, *Principles of Political Geography* (New York: Appleton-Century-Crofts, 1957), pp. 7–12; Isaiah Bowman, ‘Geography vs. geopolitics’, *Geographical Review*, 32 (1942), pp. 646–658.

³⁴ Colin S. Gray and Keith Payne, ‘Victory is possible’, *Foreign Policy*, 39 (1980), pp. 14–27; Francis P. Sempa, ‘Colin Gray and the revival of classical geopolitics’, *RealClearDefense* (6 April 2020), available at: https://www.realcleardefense.com/articles/2020/04/06/colin_gray_and_the_revival_of_classical_geopolitics_115176.html].

³⁵ Colin S. Gray, *American Military Policy: Information Systems, Weapon Systems and Arms Control* (Cambridge: Abt, 1982); Colin S. Gray, ‘Space is not a sanctuary’, *Survival*, 25 (1983), pp. 194–204.

³⁶ Colin S. Gray, ‘The influence of space power upon history’, *Comparative Strategy*, 15 (1996), pp. 293–308 (p. 300).

³⁷ David E. Lupton, *On Space Warfare: A Space Power Doctrine* (Maxwell Air Force Base: Air University Press, 1998 [1988]).

³⁸ Much of what is happening in the sphere of nuclear weaponry in the 1970s has of course a space dimension. Gray, *The Geopolitics of the Nuclear Era*.

³⁹ Colin S. Gray, *Another Bloody Century: Future Warfare* (London: W&N, 2005), pp. 295–301.

⁴⁰ Joseph M. Goldsen, *Outer Space in World Politics* (London: Pall Mall Press, 1963); Robert Salkeld, *War and Space* (Englewood Cliffs, NJ: Prentice-Hall, 1970); Don E. Kash, *The Politics of Space Cooperation* (Lafayette, IN: Purdue University Studies, 1967). The exception is the book *Basic Principles of Geopolitics and History* by Debabrata Sen. But this work, which does feature passages on outer space and discusses the latter from a Braunian perspective, is ignored by those who develop astropolitics in an Anglo-American context. A brief 1981 article by Kemp seems to have made no real impact either. Debabrata Sen, *Basic Principles of Geopolitics and History* (Delhi: Concept Publishing, 1975); Geoffrey Kemp, ‘Geopolitics, remote frontiers and outer space’, *The Fletcher Forum*, 5 (1981), pp. 115–19.

⁴¹ Wernher von Braun, *First Men to the Moon* (New York: Holt, Rinehart and Winston, 1960).

build a rotating wheeled space station which could function as a research base and battle station. Able to launch pre-emptive nuclear missiles, he hopes that his orbital space habitat can achieve 'space superiority' over the Soviets whilst serving as a harbour for further voyages into space.⁴² Von Braun is fantasising about a god-like eye on the earth, an Olympian form of power that can produce mass death at the press of a button. It is not perhaps geopolitics in the purest sense of the word, as a use of geographical concepts to gain some form of mastery, but it is not far removed.

Many of the writings of von Braun, his teacher Hermann Oberth, and Willy Ley are technical, featuring detailed discussion of ballistics, rocket designs, and equations. They are also written in a highly optimistic and celebratory tone. Clearly, they promote the expansion of human habitat on both a planetary scale and local scale, i.e. how living quarters on spaceships can be made viable. Whilst this is thus living space by proxy, it is not geopolitics in the strictest sense. Hermann von Oberth, an unrepentant Nazi, writes in the 1980s about all aspects of political life (happiness, art, communism, reproduction, UFOs, and so on) but has only very little to say about geography, a brief comment on buffer states in an age of nuclear war aside.⁴³ That said, he too confesses in the 1920s to being a reader of geopolitical pamphlets, probably a reference to Karl Haushofer's *Zeitschrift für Geopolitik*.⁴⁴

Ultimately, there is a common language which connects the worldview of the mid-century space pioneers to German geopolitics: evolutionary theory, competition, spatial expansionism, and militarism.⁴⁵ To get a better sense of the primordial soup within which astropolitics is born, we must return to the pivotal figures of German spatial thought.

Ratzel and Schmitt

The most obvious root of contemporary astropolitics can be found in the writings of the Leipzig geographer Friedrich Ratzel, famous for popularising the idea of *Lebensraum* (living space). Ratzel uses the term to capture a logic of spatial expansion which he finds in all life, flora and fauna, and which he sees as checked only by the planet's finite resources. In essence, he employs living space as an act of semantic blending of what are previously distinct logics: the biological *habitat* and the political *territory*.

After volunteering in the Franco-Prussian war of 1870/1, where he is wounded, he embarks on an expedition to the Americas as a travel writer. It is this experience that sparks in him the idealisation of the Anglo-Saxon settlers of North America over the French and Spanish colonists. It is because of their greater conception of space (*größere Raumauffassung*) that the Anglo-Saxons purchase Indigenous territories one after another. They alone, Ratzel argues, are able to see how this land is beginning to form a new *Lebensraum*. He admires their ruthless extermination of the Indigenous Americans.⁴⁶ Having encountered the rise of the 'lost cause', he also daydreams about a global system of racial segregation modelled on the American South.⁴⁷ After returning to Europe,

⁴²Michael J. Neufeld, "'Space superiority": Wernher von Braun's campaign for a nuclear-armed space station, 1946–1956', *Space Policy*, 22 (2006), pp. 52–62.

⁴³Hermann Oberth, *Primer for Those Who Would Govern* (New York: West-Art, 1987).

⁴⁴Hermann Oberth, *Ways to Spaceflight* (Springfield: National Aeronautics and Space Administration, 1970 [1929]), p. 279.

⁴⁵Dolman may have encountered Darwinian thinking in outer space via other intermediaries such as the American futurist and aerospace engineer Dandridge Cole, who likes to quote Ratzel's mentor Ernst Haeckel and who is today mostly known for his idea of planetoid bombs. His – heavily illustrated – work is in many ways closer to science fiction than to geopolitics. Before his death in 1965, Cole fantasised about cyborgs, closed ecological systems, cryonics, and asteroid colonisation. Clearly under the influence of Wernher von Braun's writings, he bemoaned that only the Persians and Nazis have thus far tried to harden the human race by exposing it to pain and hardship to such an extent that it might venture further into deep space. Dandridge M. Cole, *Beyond Tomorrow: The Next 50 Years in Space* (Amherst, MA: Amherst Press, 1965), pp. 119–120. Dolman cites Cole on page 1 of his book. More recent sources of inspiration include the popular books of Robert Zubrin.

⁴⁶Friedrich Ratzel, 'Über Kalifornien', in Hans Helmolt (ed.), *Kleine Schriften von Friedrich Ratzel*, vol. 2 (Munich: R. Oldenbourg, 1906 [1877]), pp. 1–18.

⁴⁷Ian Klinke, *Life, Earth, Colony: Friedrich Ratzel's Necropolitical Geography* (Ann Arbor: University of Michigan Press, 2023).

Ratzel becomes one of Germany's loudest advocates for settler colonies in Africa, serving as a member of the Pan-German League, rightly designated as a proto-fascist organisation by Hannah Arendt.⁴⁸ He is well networked in Germany's colonial elite, active in the German Colonial Society, and corresponds with some of the empire's most notorious landgrabbers. Nations and states, he theorises, are subject to a 'colonisation drive' (*Colonisationstrieb*) which prompts them to migrate and subdue until they reach another polity or a geographical barrier (although some of these too may eventually be overcome). Migration and military advances are ultimately epiphenomena of the *Colonisationstrieb* which he observes in the plant and animal kingdom.

Trained as a zoologist, Ratzel is in the camp of the so-called *Darwinisten*, a group of scholars who defend evolutionary theory and seek to apply its lessons, much like Darwin does, to aspects of human life. Ratzel has devoured Charles Darwin's work as a student and translated 'Darwin's bulldog' Thomas Henry Huxley into German. He is perhaps most directly influenced by his mentor Ernst Haeckel, a man who sells more books than Darwin in the 19th century. There is clearly also a Malthusian barrier in Ratzel's thinking. As he argues in his 1901 *Lebensraum* essay:

There is a tension between the movement of life, which never rests, and the space on earth, which does not change. It is from this tension that the struggle for space is born.⁴⁹

It is in Ratzel then that we can detect the clearest articulation of what Tim Marshall and other space expansionists see as the fundamental impetus behind cosmic colonisation, that tension between the movement of life (that restlessness) and the finitude of the earth's resources. Ratzel frames states as organisms that struggle for space under the influence of environmental factors, a language which Wernher von Braun will pick up and develop, too.⁵⁰ Building on this, Ratzel develops the law of spatial growth which holds that states grow with their level of civilisation. The 'enlargement of the geographical horizon' is followed by 'political expansion'; the 'growth of states proceeds through the annexation of small territories to amalgamation, while at the same time the attachment of the people to the soil becomes ever closer.'⁵¹ In order to develop such an attachment, states need to establish permanent settlements and develop agricultural ties.

Ratzel tends to return to the influence of environmental factors which induce political spaces to grow or contract. But there is in wide space itself also something 'creative' that does things politically.⁵² It is precisely this idea of space acting creatively upon a nation or state's desire to colonise which the Nazi jurist Carl Schmitt picks up from Ratzel. Known today for his theory of sovereignty, critique of liberalism, and musings on world order (for which he prefers the Ancient Greek word *Nomos*), Schmitt gravitates in the 1940s towards the school of *Geopolitik* without ever fully embracing it. He begins to consider what a world of politically autonomous greater spaces (*Großräume*) might look like and what place a territorially augmented German Reich might have within such an order.⁵³ Schmitt never renounces his wartime writings, or indeed national socialism, and remains well networked in Francoist Spain.

We get a sense of Schmitt's geopolitics and how it might prefigure astropolitics in his 1942 *Land and Sea*, a wartime blueprint for his post-war *Nomos of the Earth*. In this short pamphlet, supposedly written as a bedtime story for his daughter Anima, Schmitt seeks to read world history as a struggle between land and sea. But rather than treat this conflict as entirely binary and ahistorical (although he clearly displays a tendency to do so in some passages), *Land and Sea* also develops the

⁴⁸Hannah Arendt, *The Origins of Totalitarianism* (San Diego: Harvest, 1979 [1951]).

⁴⁹Friedrich Ratzel, 'Lebensraum: A biogeographical study (translated by Tul'si [Tuesday] Bhambry)', *Journal of Historical Geography*, 61 (2018 [1901]), pp. 59–80 (p. 72).

⁵⁰Fred Scharmen, *Space Forces: A Critical History of Life in Outer Space* (London: Verso, 2021).

⁵¹Friedrich Ratzel, 'The territorial growth of states', *Scottish Geographical Magazine*, 12 (1898), pp. 351–61 (pp. 354–5).

⁵²Ratzel, 'Lebensraum', p. 76.

⁵³Carl Schmitt, 'The *Großraum* order of international law with a ban on intervention for spatially foreign powers: A contribution to the concept of *Reich* in international law (1939–1941)', in Thomas Nunan (ed.), *Carl Schmitt: Writings on War* (Cambridge: Polity, 2011 [1941]), pp. 75–124.

notion of 'spatial revolution' (*Raumrevolution*). These are epoch-making changes to the way space is perceived and organised. The circumnavigation of the world and colonisation of America constitutes one such revolution which forms a new planetary consciousness. In the mid-20th century, the world is experiencing a further such revolution. Although the outcome is yet to be determined, it is clear to Schmitt that this new and fully globalised order is unlikely to be marked by the kind of stability he sees in the order of European states.

Schmitt propagates arguments which many would today associate with political realism. Indeed, E. H. Carr drew inspiration from Schmitt in the 1940s, much to the dismay of another realist – Hans Morgenthau.⁵⁴ Schmitt's 'realist' lines of reasoning include, most prominently, a critique of liberalism and international law, an attempt to divorce morality from politics, and a crude valorisation of the Westphalian system of states, transposed by Schmitt onto the sphere of 'greater spaces'. As the case of Morgenthau reveals, Schmitt's realism was not embraced by all mid-century American realists. It certainly lacks the deep-seated liberalism and constructivist ethos of someone like John H. Herz.⁵⁵ If at all, synergies are clearer with neo-realism. Schmitt's concept of *Großraum*, moreover, clearly contains a meaning that is close to 'sphere of influence', as used by contemporary realists such as John Mearsheimer.⁵⁶ Although *Großraum* is not a concept Mearsheimer, unlike Carr, adopts, he draws on Schmitt in developing a critique of liberal order.⁵⁷ And although Schmitt, as we shall see below, is more nuanced on the question of deep historical change than neo-realists like Mearsheimer, the German spatial theorist too tries to find intellectual ways to oppose the downgrading of great power status and to legitimate expansionism as a form of balancing.

Schmitt's 1950 *The Nomos of the Earth*, often seen as his magnum opus, is explicit about its indebtedness to Ratzel and other geographers, including Mackinder. Like Ratzel, Schmitt is interested in global forms of ordering. The term *Großraum* is already used by Karl Haushofer and other Ratzelians at the time and even appears in adjectival form in Ratzel. And yet there are crucial inflections which stem in part from Schmitt's legal perspective. Schmitt ontologises the capture of land (*Landnahme*) as *the* original act of ordering. The acts of appropriating, dividing, and pasturing are the crucial features of each *Nomos*. The law, in other words, follows the crude exercise of power. If at all, this is only implicit in Ratzel. Ultimately, Schmitt is not a thinker of immutable environmental forces but of spatial revolution.

Clearly, Dolman and Gray are trying to replicate an American canon of political realism of which German geopolitics is a crucial ingredient.⁵⁸ In doing so, they are operating with a shortened version of realism, essentially as 'strategic realism with an attention to geography'.⁵⁹ But there are also obvious Schmittian undertones in the diagnosis of the space age as a *Nomos* in which those who are up there first (SpaceX et al.) will define the rules, i.e. the acknowledgement that here too law and ethics will follow power. Dolman is using a Schmittian line of reasoning when he rejects the Outer Space Treaty and argues that 'might does make right'.⁶⁰

One thing that is missing in both Ratzel and Schmitt but which is present in contemporary astropolitics is a concern with military strategy. Although Ratzel and Schmitt are increasingly

⁵⁴Hans Morgenthau, 'The political science of E. H. Carr', *World Politics*, 1 (1948), pp. 127–34 (p. 134). E. H. Carr does not cite Schmitt but uses the German term *Großraum* affirmatively even as late as 1945 and credits the 'German geo-politicians' with this innovation. E. H. Carr, *Nationalism and After* (London: Macmillan, 1945), p. 52.

⁵⁵Caspar Sylvest, 'John H. Herz and the resurrection of classical realism', *International Relations*, 22 (2008), pp. 411–18.

⁵⁶Stuart Elden, 'Reading Schmitt geopolitically', *Radical Philosophy*, 161 (2010), pp. 18–26.

⁵⁷John J. Mearsheimer, *The Great Delusion: Liberal Dreams and International Realities* (New Haven, CT: Yale University Press, 2018), pp. 43, 273.

⁵⁸Matthew Specter, *The Atlantic Realists: Empire and International Political Thought between Germany and the United States* (Stanford, CA: Stanford University Press, 2021).

⁵⁹Daniel Deudney, 'Geopolitics as theory: Historical security materialism', *European Journal of International Relations*, 6 (2000), pp. 77–107 (p. 100).

⁶⁰Dolman, *Astropolitik*, p. 156; see also MacDonald, 'Anti-Astropolitik', p. 608.

recognised as historically important theorists of war,⁶¹ neither of them produces a work of strategy. Ratzel's follower and Schmitt's contemporary Karl Haushofer, however, does. It is Haushofer's 1934 *Wehrgeopolitik* (defence geopolitics), which first draws an intellectual lineage from Clausewitz to Ratzel, Mahan and Mackinder. Indeed, his attempt to catalogue the geography of terrestrial war (the role of oceans, vegetation, the built environment, etc.) with the copious use of maps, of which neither Ratzel nor Schmitt make much use, prefigures what astropolitics tries to do for outer space. Already in 1934 Haushofer writes about the military significance of the entire planet, from subterranean oil deposits and the use of echo-sounding technology in the depths of the oceans to the projectiles of the so-called Paris gun.⁶² A German siege weapon employed briefly in 1918, the latter's projectiles reached stratospheric heights of over 40 kilometres on their way to the French capital. But a personal interest in astrology notwithstanding, Haushofer seems uninterested in theorising outer space. He takes his life in 1946 without reflecting on the rise of liquid propellant rocketry and the latter's political impact.

As we have seen, Ratzel and Schmitt (and to a lesser extent Haushofer) supply a conceptual vocabulary and political vision for the emergence of astropolitics as the application of geopolitics to outer space. By the 1940s, *Geopolitik* has thoroughly shaped a generation of German intellectuals and scientists, especially those willing to do business with the Third Reich, a group which of course includes the German space pioneers. It has also forged the worldviews of American émigré geopoliticians who will, in turn, prove an influence on early astropolitics. And yet neither Ratzel nor Schmitt are in fact, as we will see, outer space expansionists. How, then, do they engage with the question posed by the conquest of outer space?

Schmitt's critique of astropolitics

Schmitt does not consider outer space before the end of the Second World War, either because he previously deems the cosmos inaccessible to humanity, or, quite simply, because his mind is elsewhere. But he does, unlike the other key figures of the classical geopolitical canon, live to witness the space race. In the years that follow the Second World War, he begins to ponder whether geopolitics could and should extend into outer space.

Around 1949/50, Schmitt starts collecting newspaper clippings about space suits and speculates in private about alien invaders who might instrumentalise humanity's existing Cold War rift to divide and rule planet earth.⁶³ Outer space appears for the first time in writing in the 1950 foreword to *The Nomos of the Earth*. Here, the jurist observes that the traditional Eurocentric order established by 'a legendary and unforeseen discovery of a new world' is now in ruins.⁶⁴ 'Only in fantastic parallels can one imagine a modern recurrence,' he continues, 'such as men on their way to the moon discovering a new and hitherto unknown planet that could be exploited freely and utilized effectively to relieve the struggles on earth.' Schmitt cautions immediately that the question of world order, with which he is grappling, is 'not answered with such fantasies, any more than it will be with further scientific discoveries.'⁶⁵ He clearly does not want a repeat of 1492. Humanity's only hope is to reaffirm its terrestrial home.

It is instructive to examine how Schmitt arrives at this consideration of outer space by venturing back to *Land and Sea*. On the final page of his 1942 pamphlet, Schmitt considers the challenges

⁶¹ Beatrice Heuser, *The Evolution of Strategy: Thinking War from Antiquity to the Present* (Cambridge: Cambridge University Press, 2010); Benno Teschke, 'Carl Schmitt's concept of war: A categorical failure', in Jens Meierhenrich and Oliver Simons (eds), *The Oxford Handbook of Carl Schmitt* (Oxford: Oxford University Press, 2016), pp. 367–400.

⁶² Karl Haushofer, *Wehr-Geopolitik: Geographische Grundlagen einer Wehrkunde* (Berlin: Junker und Dünnhaupt, 1934), pp. 15–16.

⁶³ Carl Schmitt, *Glossarium: Aufzeichnungen aus den Jahren 1947–1958* (Berlin: Duncker & Humblodt, 2015 [1991]), pp. 206, 228.

⁶⁴ Carl Schmitt, *The Nomos of the Earth in the International Law of the Jus Publicum Europaeum* (New York: Telos, 2006 [1950]), p. 39.

⁶⁵ *Ibid.*

posed by the rise of aerial warfare and which reveal both an ambivalence towards air power and a willingness to consider the latter as a spatial revolution.

Aware as one is that airplanes criss-cross the air space above seas and continents, and the waves broadcast by transmitters in every country cross the atmosphere and circle the globe in a matter of seconds, one is tempted to conclude that man has conquered not only a third dimension, but also the third element, air, the new elemental space of human existence. To the two mythical creatures, leviathan and behemoth, a third would be added, quite likely in the shape of a giant bird.⁶⁶

Schmitt does not mention outer space in 1942. When he publishes *Nomos of the Earth* eight years later, he returns to the question of air power, but now includes space colonisation in his warning.

Where do we stand today? The earlier balance, based on the separation of land and sea, has been destroyed. Development of modern technology has robbed the sea of its elemental character. A new, third dimension – air space – has become the force-field of human power and activity. Today, many believe that the whole world, our planet, is now only a landing field or an airport, a storehouse of raw materials, and a mother ship for travel in outer space.⁶⁷

The spaceship, in other words, is an extension of humanity's grasp for the air, which he has already described eight years earlier. Again, he uses the word 'fantastic' to characterise such endeavours but does not explain what exactly makes them fantastic at a time when the United States have already used von Braun's V-2 rocket to take pictures from orbit and launch animals into space. Given the centrality that Schmitt gives to technological advances such as the transition from oared vessels to sailing ships or that from sailing ships to steamboats, it is surprising that he comes out in 1950 as ambivalent if not dismissive of humanity's attempts to conquer outer space. It is particularly puzzling because Schmitt has in 1942 already warned that the arrival of the aeroplane is contributing to a *Raumrevolution*.

This is not Schmitt's last word on outer space. Faced with his difficulty of finding paid employment in West Germany as an unrepentant Nazi, he briefly tries to become a public intellectual to earn money. He writes two popular texts on 'new space' in the 1950s. Although framed as Socratic dialogues, they are biblical in tone. Schmitt understands that technology has improved to such a degree that if the Cologne Cathedral stood on the Moon (Schmitt is Catholic), humans could now see it there. But although the dialogues are underwritten by a concern with the effects of unencumbered technological advances, there is more here than meets the eye.

In *Dialogue on New Space*, Schmitt stages an encounter between two figures, a natural scientist and an ancient historian (who represents Schmitt himself). Just as the two men are in full swing, discussing science, history, theology, and politics via the prism of land and sea, their dialogue is interrupted by a character Schmitt names 'MacFuture'. MacFuture stands for a naive, spaceless (and clearly American) form of liberalism which celebrates technological advances, particularly the advent of nuclear weapons, the rise of computation, and humanity's grasp for outer space. Bruno Latour notes that MacFuture could function as an exceptionally well-drawn caricature of Elon Musk.⁶⁸ Schmitt dismisses MacFuture in no uncertain terms in a 1962 foreword to the Spanish edition as 'a young North American, MacFuture, who is of the opinion that the earth has been too small for quite some time and who desires to pursue further, in cosmic dimensions, the discovery of America and the industrialization of his country'.⁶⁹

⁶⁶ Carl Schmitt, *Land and Sea* (Washington, DC: Plutarch, 1997 [1942]), pp. 57–8.

⁶⁷ Schmitt, *The Nomos of the Earth*, p. 354.

⁶⁸ Bruno Latour, 'How to remain human in the wrong space? A comment on a dialogue by Carl Schmitt', *Critical Inquiry*, 47 (2021), pp. 699–718 (p. 709).

⁶⁹ Carl Schmitt, 'Prologue to the 1962 Spanish edition', in Andreas Kalyvas and Federico Finchelstein (eds), *Carl Schmitt: Dialogues on Power and Space* (Cambridge: Polity, 2015), pp. 19–21 (p. 20).

Schmitt's shorter writings from the 1950s are attempts to defend ideas first presented in *Land and Sea* and *Nomos of the Earth* in the context of the nuclear arms and space race. Clearly, he is making a case for geopolitics as a terrestrial form of knowledge. Just like elsewhere, he leans on Mackinder, whom he calls 'brilliant'.⁷⁰ Unlike in 1941, when he speaks of Ratzel as the 'founder of a new science of space' who recognised the mastering of space (*Raubbewältigung*) as 'the defining trait of all life',⁷¹ or in 1950 when he cites him approvingly in *Nomos of the Earth*,⁷² Schmitt neither invokes the Leipzig geographer by name nor does he discuss his cosmic writings. And yet he uses MacFuture to remind humanity that its *Lebensraum* – and Schmitt continues to use Ratzel's now-discredited term – remains on planet earth.⁷³ Schmitt ends by making a case for a 'terrestrial mode of being' (*terranes Dasein*) upon which institutions such as 'property, marriage, family and hereditary right' are built.⁷⁴ Whilst the spatial archetype of maritime existence is the ship, which represents for Schmitt a celebration of technology, it is the humble house which materialises a terrestrial mode of being. Like elsewhere in his writing, Schmitt valorises the peasant who works the farm which gives 'the land' in him too an agricultural connotation.

When MacFuture speaks of 'the infinite spaces of the whole cosmos [which] open themselves to us',⁷⁵ the ancient historian Altmann (i.e. Schmitt) responds that MacFuture is unable to see the conquest of outer space as anything but 'a new edition of the discovery of America'.⁷⁶ A potential spatial revolution will not, Altmann explains, stem from the vast unknowns of outer space ('with the exception, at best, of flying saucers') but rather from the dangers of unencumbered technology. MacFuture, Schmitt claims, 'could make a spaceship out of our earth' but he would still fail to heed the call of a new spatial revolution posed by dangers of limitless technology. 'The one who manages to restrain unencumbered technology, to bind it and to lead it into a concrete order has given more of an answer to the contemporary call than the one who, by means of modern technology seeks to land on the moon or on Mars.'⁷⁷ And he continues on the next page that 'the human is a son of the earth, and he shall remain as long as he remains human.'⁷⁸ Even when in later years he speculates about astronauts morphing into 'cosmopirates' and 'cosmopopartisans' in the far reaches of the universe,⁷⁹ he is quick to repatriate and re-earth his discussion and its protagonists.⁸⁰

Given such an explicit rejection of the act of projecting geopolitics into outer space, Schmitt may not seem like an obvious intellectual precursor of astropolitics. And yet, in his crude power politics, where the law is a mere tool of the victorious and where land appropriation is celebrated, and in his insistence on spatial revolution, he clearly prefigures it. Although Schmitt seems keen to critique space colonisation *politically* as a symptom of American liberal spacelessness, it is not clear why he cannot nonetheless categorise humanity's grasp for outer space *analytically* as a spatial revolution.

⁷⁰ Carl Schmitt, 'Dialogue on new space', in Andreas Kalyvas and Federico Finchelstein (eds), *Carl Schmitt: Dialogues on Power and Space* (Cambridge: Polity, 2015 [1958]), pp. 51–83 (p. 61).

⁷¹ Schmitt, 'The *Großraum* order', p. 122.

⁷² Schmitt, *The Nomos of the Earth*, pp. 88, 283.

⁷³ The way in which Schmitt presents his dialogue makes it clear that he understands very well that geopolitics, at least in its cruder forms, is under something of a taboo. It is noteworthy that Schmitt defines *Lebensraum* as 'dry land' in line with Ratzel's insistence on the oecumene. Schmitt, 'Dialogue on new space', p. 54. But, as Kalyvas and Finchelstein note, the term appears in a 'theological and mythical fashion only to be obliquely transformed into a (trans-)historical theory of world-history as the perennial conflict between land and sea'. Andreas Kalyvas and Federico Finchelstein, 'Editors' introduction', in Andreas Kalyvas and Federico Finchelstein (eds), *Carl Schmitt: Dialogues on Power and Space* (Cambridge: Polity, 2015), pp. 1–15 (p. 12).

⁷⁴ Schmitt, 'Dialogue on new space', p. 73.

⁷⁵ Schmitt, 'Dialogue on new space', p. 77.

⁷⁶ Schmitt, 'Dialogue on new space', p. 78.

⁷⁷ Schmitt, 'Dialogue on new space', p. 80.

⁷⁸ Schmitt, 'Dialogue on new space', p. 81.

⁷⁹ Carl Schmitt, *Theory of the Partisan: Intermediate Commentary on the Concept of the Political* (New York: Telos Press, 2007 [1963]), p. 80.

⁸⁰ Peter Szendy, *Kant in the Land of Extraterrestrials: Cosmopolitical Philosophical Fictions* (New York: Fordham University Press, 2013), p. 25.

There is in Schmitt then something of an unaccounted-for gravitational pull back to earth, which we can also observe in Ratzel. The caveat here is of course that Ratzel dies in 1904, long before the V-2, Sputnik, and Apollo.

Ratzel's cosmic geography

Much like Alexander von Humboldt before him, Friedrich Ratzel feels that all geographical inquiry should begin with cosmography, a description of the celestial bodies of which the earth is but one.⁸¹ The Leipzig geographer is interested in solar spots, meteors, 'dead stars,' and the possibility of water on Mars. He publishes extensively on astronomical questions, such as the physiognomy of the moon,⁸² solar eclipses,⁸³ and even the evolution of the solar system and universe.⁸⁴

When Ratzel writes about outer space, he is often, perhaps always, grappling with the implications for his anthropogeography. He concludes that 'we must take our scales of geographic space and time from outer space, not from the earth.'⁸⁵ It is his observation that a view into the night-time sky is in fact a view into the universe's past which inspires him to note that 'in space, we read time.'⁸⁶ This is in effect a recognition that the substance he is dealing with is not space but rather space time. Astronomical distance, after all, is measured in light years. Geographers, he feels, should read the earth's surface as a vast clock face on which the planet's past can be interpreted.

A second crucial preoccupation of his is the insistence on treating the earth as a planet. In his *Lebensraum* essay, he argues the following:

The conditions under which all life develops are governed by a great telluric force. Individual cases may appear to be determined by purely local circumstances, but delving deeper we soon discover roots that are entwined with the basic properties of the planet.⁸⁷

Crucially thus, the earth is not just a *world* or simply a *soil* – but a planet.⁸⁸ The historic forces which his anthropogeography seeks to explain emerge from geology and climate, which are themselves ultimately symptoms of larger cosmic forces. In this vein, Ratzel continues on the same page of his *Lebensraum* essay:

The history of the particular type of mint that only occurs in a few Alpine meadows in Carinthia, the history of the insectivore that lives within the bounds of a single high valley in the Pyrenees, and that of the smallest Pygmy tribe in the African jungle – they all bear the living mark of the size and shape, movements, mass and material composition of the globe as a whole [*des ganzen Erdballs*].⁸⁹

It is striking that most of Ratzel's cosmology (and he does use that term in passing) is esoteric and bears little resemblance to contemporary astropolitics. At a basic level, it is informed by a version of Haeckel's monism, the confidence in the singleness of existence. This prompts Ratzel to incessantly

⁸¹Friedrich Ratzel, *Die Erde in Vierundzwanzig Gemeinverständlichen Vorträgen über Allgemeine Erdkunde* (Stuttgart: J. Engelhorn, 1881).

⁸²Friedrich Ratzel, 'Die physiognomie des mondes', in Hans Helmolt (ed.), *Kleine Schriften von Friedrich Ratzel*, vol. 2 (Munich: R. Oldenbourg, 1906 [1879]), pp. 24–30.

⁸³Friedrich Ratzel, *Glücksinseln und Träume: Gesammelte Aufsätze aus dem Grenzboten* (Leipzig: Fr. Wilh. Grunow, 1905).

⁸⁴Friedrich Ratzel, 'Die Kant-Laplacesche Hypothese und die Geographie', in Hans Helmolt (ed.), *Kleine Schriften von Friedrich Ratzel*, vol. 2 (Munich: R. Oldenbourg, 1906 [1901]), pp. 420–36.

⁸⁵Friedrich Ratzel, *Die Erde und das Leben, 1. Band* (Leipzig: Bibliographisches Institut, 1902), p. 85.

⁸⁶Friedrich Ratzel, 'Geschichte, Völkerkunde und Historische Perspektive', *Historische Zeitschrift*, 93 (1904), pp. 1–46 (p. 28).

⁸⁷Ratzel, 'Lebensraum', p. 60.

⁸⁸Ratzel also referred to the earth either as a *Planet* or as an *Erdball*. The latter is usually rendered 'globe' in English, but a more literal translation would be 'earth ball'.

⁸⁹Ratzel, 'Lebensraum', p. 60.

collapse conceptual binaries. The Leipzig geographer also comes to believe that the age of the earth is unknown and that earlier evolution may well have occurred before the current one. Even though these evolutionary trees have been wiped out, they might become knowable in the same way as previous evolutionary stages could be deduced from studying embryonic development.⁹⁰ This is a direct application of Ernst Haeckel's credo that *ontogeny recapitulates phylogeny*.

Ratzel is a follower of the physicist-turned-philosopher Gustav Fechner, who theorises human subjectivity from the perspective of astronomy and particle physics in the mid-19th century.⁹¹ Although he is today primarily remembered as one of the founders of experimental psychology, Fechner also writes semi-satirical pamphlets on the spirits of plants and even on the comparative anatomy of angels. He is a thinker of analogy. The nervous system of animals resembles the vascular system of plants; organism and planet are structurally similar, and so on.⁹² Ratzel uses Fechner's panpsychism to reason both that there is no meaningful boundary between life and death, and that the universe is consciously besouled. After death, human consciousness is poured out into cosmic consciousness. The demise of the human organism prompts, in other words, a cosmic rebirth.

Like Fechner, Ratzel theorises on the basis of astronomy. As he writes in 1901, 'life on earth contains the sum of the telluric, solar and cosmic influences that have built up, that have permeated each other, that have battled and enhanced one another from the moment of life's first germination until this day'.⁹³ Just as the evolution of life on earth is competitive and creative, so is the evolution of the universe. Ratzel likes to emphasise that his main object of analysis, planet earth, is in fact 'interspersed and covered with the dust and debris of space'.⁹⁴ He also notes that spectral analysis has only found similar chemical compounds and celestial bodies throughout the universe and interprets this to mean that there is a need to return to spiritual modes of inquiry to gain a deeper understanding of humanity's place in the cosmos.⁹⁵ In this vein, Ratzel postulates a 'spiritual unity' between the earth and the cosmos which 'bring[s] the most distant celestial bodies closer to us', thereby enriching 'our earthbound existence'.⁹⁶

But Ratzel adds a crucial ingredient to this harmonious, Humboldtian cosmology: earthly and spatial narrowness. Both Copernicus and Columbus, he argues, confront humans with the same truth, namely that the earth is *small*.⁹⁷ This is the same telluric narrowness that is so crucial to his political geography. Political organisation and growth are subject to planetary boundaries, i.e. the Malthusian barrier presented by finite space and finite resources. It is thus that his political geography preaches that wide spaces, the kind that European settlers have conquered in North America, are crucial to the survival and flourishing of states.

Ratzel dies on the eve of the era of aviation. Unlike in the case of his contemporary Cecil Rhodes, there is no evidence that the Leipzig geographer fantasises about the projection of territorial sovereignty into the cosmos. In the late 1870s, he has already spoken out against the idea that proto-life may have travelled to earth via meteoroids.⁹⁸ In later years, he remains non-committal on the question of whether there is life elsewhere in the universe.⁹⁹ And yet his panpsychism has in many ways brought the universe closer to home. In a thermodynamic register, the Leipzig

⁹⁰ Anonymous, 'Weltentwicklung und Weltschöpfung. Mit einem Anhang über Lyells und Darwins Gottesideen', *Die Grenzboten*, 61 (1902), pp. 669–84.

⁹¹ Friedrich Ratzel, 'Die Tagesansicht Gustav Theodor Fechners', *Die Grenzboten*, 60 (1901), pp. 169–78.

⁹² Gustav T. Fechner, *Zend-Avesta: Oder über die Dinge des Himmels und des Jenseits. Zweite Auflage, 2. Band* (Hamburg: Verlag von Leopold Voß, 1901 [1851]).

⁹³ Ratzel, 'Lebensraum', p. 61.

⁹⁴ Friedrich Ratzel, *Die Erde und das Leben, 1. Band* (Leipzig: Bibliographisches Institut, 1902), p. 91.

⁹⁵ Friedrich Ratzel, 'Freunde, im Raum wohnt das Erhabene nicht!', in Hans Helmut (ed.), *Kleine Schriften von Friedrich Ratzel*, vol. 1 (Munich: R. Oldenbourg, 1906 [1903]), pp. 293–7.

⁹⁶ Ratzel, *Die Erde und das Leben*, p. 91.

⁹⁷ Friedrich Ratzel, *Raum und Zeit in Geographie und Geologie: Naturphilosophische Betrachtungen*, ed. Paul Barth (Leipzig: Johann Ambrosius Barth, 1907), p. 6.

⁹⁸ Ratzel, 'Die Physiognomie des Mondes', p. 26.

⁹⁹ Ratzel, *Raum und Zeit in Geographie und Geologie*, p. 169.

geographer notes that ‘just as the warmth of the sun makes the earth livable for us, so does insight into the nature of the sun make us feel more at home in the universe.’¹⁰⁰ Like all the different *Lebensräume* on earth, the *Lebensraum* of planet earth itself must be understood in its environmental context, too. And that environment is the realm of cosmic forces. Within this vast ocean of stars and galaxies, earth is defined by a narrowness or lack of space which the age of exploration, both scientific and colonial, has made apparent. This telluric narrowness, Ratzel believes, is the source of all conflict on earth.

Even though Friedrich Ratzel does not endorse human expansionism into outer space, he assembles the conceptual and political vocabulary for it: he frames colonisation as a biological drive, establishes the laws of spatial growth, and notes his regret at the finitude of the earth’s resources. He even recognises that ‘the great importance of cosmic distances for geography’ lies precisely in the fact that they might ‘withdraw us forever from that telluric narrowness.’¹⁰¹ ‘If only earth had more space,’ he sighs in one of his final writings.¹⁰²

Why so reluctant?

As we have seen, neither of the two spatial thinkers examined in this paper promoted interplanetary colonisation, despite having assembled the conceptual vocabulary for space expansionism. Why is this so? It seems obvious that Schmitt’s rejection of astropolitics, alongside aerial warfare and nuclear weapons, is politically rather than analytically motivated. There is nothing in his corpus that allows for a moral condemnation of specific technologies. Like Mackinder, Schmitt is all too happy to discuss milestones in the evolution of naval technology without ever denouncing any of these steps because they supposedly destabilise global order (which they most certainly did). Schmitt is, in other words, a technophobe only when it comes to recent technological innovations and particularly those that have benefited the victors of the Second World War. We may wonder what he would have written if Nazi Germany had won the war and von Braun had continued to develop the V-2 for the Nazis. Rather than rejecting rocketry as a symptom of a liberal spacelessness, he would have surely found a way to hail it as the agent of a definitive *Raumrevolution*, the birth of a new fascist *Nomos*.

Why does Ratzel struggle to see outer space as having potential for human colonisation? The obvious answer seems to be that he is writing before the age of modern rocketry and may not have contemplated multi-planetary evolution. And yet, we must remember that when Ratzel publishes his most notable ideas, speculation on space travel and life on Mars is rife.¹⁰³ Indeed, some of his contemporaries are keenly trying to expand Darwinism into outer space, albeit in ways that push hard against the boundaries of science.¹⁰⁴ Even someone as eminent as Ratzel’s mentor Ernst Haeckel feels compelled in 1899 to deal with the question of interplanetary travel and extra-terrestrials, noting that ‘direct communication with such inhabitants of other planets seems to be excluded by the immense distance of our earth from the other heavenly bodies, and the absence of the requisite atmosphere in the intervening space.’¹⁰⁵ Although Ratzel may have questioned some aspects of Haeckel’s theory in the final years of his life, he has not abandoned the *Darwinisten* camp. Perhaps he simply does not want to contradict his intellectual master in such a direct manner.

Another interpretation would be that it is Ratzel’s commitment to Malthusianism and pansychism that prevents him from endorsing space expansionism. Indeed, the earthly limit which

¹⁰⁰Ratzel, *Die Erde und das Leben*, p. 85.

¹⁰¹Ratzel, *Raum und Zeit in Geographie und Geologie*, p. 8.

¹⁰²Friedrich Ratzel, ‘Nationalitäten und Rassen’, in Hans Helmut (ed.), *Kleine Schriften von Friedrich Ratzel*, vol. 2 (Munich: R. Oldenbourg, 1906 [1904]), pp. 462–87 (p. 483).

¹⁰³K. Maria D. Lane, *Geographies of Mars: Seeing and Knowing the Red Planet* (Chicago: University of Chicago Press, 2011).

¹⁰⁴Carl du Prel, *Die Planetenbewohner und die Nebularhypothese* (Leipzig: Ernst Günther, 1880).

¹⁰⁵Ernst Haeckel, *The Riddle of the Universe* (London: Watts, 1929 [1899]), p. 303.

Ratzel likes to invoke to naturalise conflict on earth seems redundant once we assume a world of limitless space and resources. Fechner, moreover, has already taken a stance on the issue, arguing in the 1830s that the need for space colonisation does not follow naturally from his panspsychism.

[Man] does not reach a heaven because he receives wings to fly from one planet to another or even into an unseen heaven over the visible one ... yet he will attain to all, in that, as a conscious part of the other life in the great heavenly existence that holds him, he wins a place in its high fellowship with other divinely illuminated beings.¹⁰⁶

It is hardly necessary, in other words, to colonise the universe with humanity's consciousness, given that the dead already besoul the universe. But are Malthusianism and panspsychism really insurmountable barriers for space colonists?

Here, it is important to consider that in 1897, the same year in which Ratzel publishes his magnum opus *Politische Geographie*, the bestseller *Auf zwei Planeten* appears. On the bookshelves one year before H. G. Wells's *War of the Worlds*, it tells the story of highly advanced Martian colonists who try to subdue humanity. The book has a significant impact on the formation of a German science fiction tradition and would become one of Wernher von Braun's favourites. It is written by the Fechnerian science fiction writer Kurd Lasswitz.¹⁰⁷ 1897 is also the year in which Konstantin Tsiolkovsky, later known as the 'grandfather of the Soviet rocket programme', devises his famous rocket equation. Too under the influence of Gustav Fechner, Tsiolkovsky develops a highly esoteric philosophy, known today as cosmism, alongside plans for space stations and detailed discussions on how human bodies might survive space travel.¹⁰⁸ Like Fechner and Ratzel, he believes that death is an illusion: atoms and spirits are immortal. But unlike Ratzel, Tsiolkovsky wants to find new space for humans, including resurrected humans, in other solar systems and galaxies as a solution to the problem of earthly overpopulation. Tsiolkovsky's famous quote about the earth as the mere 'cradle of humanity' has hung over science fiction and space travel like few others.

The example of Ratzel's contemporaries Lasswitz and Tsiolkovsky shows that thinkers who were both Fechnerian panspsychists and influenced by Malthus *could* nonetheless end up enthusiasts for space colonisation. The reason for Ratzel's reluctance to endorse cosmic colonisation is thus less to be found at the level of ontology than in the fact that he is ultimately writing within an analytically (as well as politically) conservative genre.¹⁰⁹ This becomes particularly clear if we examine how geopolitics treats technology. In the same way as Mahan neglects the acceleration of technological change in his day,¹¹⁰ Mackinder treats air power as a mere extension of land power precisely as Britain has witnessed the world's first air war and European cities are turned to rubble under the weight of strategic bombing.¹¹¹ Although Colin Gray certainly writes about nuclear weapons, he does so in a way that reduces them to mere instruments rather than as makers of geography itself.¹¹² Geopolitics promises crystal-ball vision, but the content of such predictions are usually presented as more of the same, i.e. shifts in the global balance of power between states. Geopolitics theorises by reference to *past* historical and technological transformations whilst often overlooking that which is *emergent*. It is remarkable how little geopolitics has to say about outer space in the

¹⁰⁶ Gustav T. Fechner, *The Little Book of Life after Death* (Boston: Little, Brown and Company, 1904 [1836]), pp. 71–2.

¹⁰⁷ Kurd Lasswitz, *Gustav Theodor Fechner*, 2nd expanded ed. (Stuttgart: Fr. Frommanns Verlag, 1902).

¹⁰⁸ Michael Hagemeister, 'Konstantin Tsiolkovskii and the occult roots of Soviet space travel', in Birgit Menzel, Michael Hagemeister, and Bernice Glatzer Rosenthal (eds), *The New Age of Russia: Occult and Esoteric Dimensions* (Munich: Verlag Otto Sagner, 2012), pp. 135–50.

¹⁰⁹ Oliver Dunnett, 'Outer space', in Mona Domosh, Michael Heffernan, and Charles Withers (eds), *The SAGE Handbook of Historical Geography, Vol. 2* (London: Sage, 2020), pp. 661–79.

¹¹⁰ Harold Sprout, 'Geopolitical hypotheses in technological perspective', *World Politics*, 15 (1963), pp. 187–212 (p. 194).

¹¹¹ Halford Mackinder, 'The round world and the winning of peace', *Foreign Affairs*, 21 (1943), pp. 595–605 (p. 602).

¹¹² Daniel Deudney, *Bounding Power: Republican Security Theory from the Polis to the Global Village* (Princeton, NJ: Princeton University Press, 2007), p. 80.

second half of the 20th century. Saul Cohen, Zbigniew Brzezinski, and Robert Kaplan are almost entirely silent on the topic, even on the all-important question of satellite technology. Whilst Ratzel is unwilling to think about emergent technologies, Schmitt does so but dismisses their political agency.

Conclusion

Outer space is political long before the first attempts to frame it geopolitically. The histories of religion, astronomy, and science fiction, after all, are all saturated with political struggles. What is specific to astropolitics, then, is the attempt to grapple with outer space via the concepts and ideas of a comparatively static and conservative late 19th- and early 20th-century school of geographical thought. In theorising from this antiquated body of thought, astropolitics has ignored the rich tapestry of spatial theories and the critical edge offered by post-Second World War political geography. Whilst early 21st-century astropolitics has tried to dispose of the analytical conservatism found in geopolitical writing, it has not freed itself from the latter's political conservatism. In what is left, I will tease out further implications of my discussion for IR.

I hope to have provided some substance to the claim that *Lebensraum* thinking in its Ratzelian and Schmittian guises echoes through the current astropolitical moment. The point was not to reify astropolitics as a field of academic inquiry that deserves its own subdisciplinary history – but rather to peer into the primordial intellectual soup out of which astropolitics as a popular genre is formed. Nor was my aim to collapse astropolitics all too crudely into *Geopolitik*. The trajectory we have uncovered from Ratzel and Schmitt to Gray, Dolman, and Marshall (and thus onto the shelves of a bookshop near you) is one of direct descentance – but it clearly includes other ancestors and mutations, too. That said, both Ratzel's and Schmitt's ideas do of course have an afterlife in Cold War Germany and North America. They are certainly embodied in the figure of Wernher von Braun. But they become absorbed too, albeit much more indirectly, into parts of the Cold War realist canon and thus IR writ large.¹¹³ What Ratzel and Schmitt have to say about outer space is swiftly forgotten, and key realist thinkers such as Hans Morgenthau and Reinhard Niebuhr have surprisingly little to say about the cosmic dimensions of the Cold War.¹¹⁴

Whilst most geopoliticians and realists remain silent on outer space, Ratzel and Schmitt *do* consider it, albeit in ways that go against the intellectual grain of the first space age. This highlights the way in which voices and visions that present alternatives to space expansionism are crowded out after the Second World War, a finding that should be of interest both to those who interpret the history of the space race in more militarised and conflictual ways¹¹⁵ and those who have sought to bring out its peaceful and cooperative dimensions.¹¹⁶ Eventually, geopolitics does embrace the space age, but only in a delayed fashion. By then, an earlier hesitance towards cosmic colonisation from the two leading German geopoliticians has already been forgotten.

Friedrich Ratzel does not contemplate interplanetary or interstellar travel in writing. Nonetheless, we can find in his works the intellectual basis – Malthusian and Darwinian, settler colonial plus militarist – for a conception of space expansionism which is then transposed into outer space by Oberth, von Braun, and others – and which lives on in SpaceX today. We find a further and important piece of the astropolitical puzzle in a Schmittian conception of the relation-

¹¹³Specter, *The Atlantic Realists*; Michael C. Williams, 'Why ideas matter in international relations: Hans Morgenthau, classical realism, and the moral construction of power politics', *International Organization*, 58 (2004), pp. 633–65.

¹¹⁴John H. Herz seems to have been aware of Schmitt's arguments upon reading *Nomos of the Earth* and makes brief reference to them in the early 1980s. John H. Herz, 'Foreign policy in the framework of an open-society bloc', *American Foreign Policy Newsletter*, 5 (1982), pp. 2–7.

¹¹⁵Bleddyn Bowen, *Original Sin: Power, Technology and War in Outer Space* (London: Hurst, 2022).

¹¹⁶Mai'a K. Davis Cross, 'The social construction of the space race: Then and now', *International Affairs*, 95 (2019), pp. 1403–21; William Stewart and Jason Dittmer, 'More-than-human space diplomacy: Assembling internationalism in orbit', *The Hague Journal of Diplomacy*, 18 (2023), pp. 219–52.

ship between power and the law. 1980s astropolitics then adds military strategy into the mix and tries to formalise von Braun's vision. Ultimately, what distinguishes German from Anglo-American geopolitics is its valorisation of *settler* colonialism. Ironically, this preoccupation arrives via Ratzel's encounter with North American settlers. This means that astropolitics, as an heir of Ratzelian geopolitics, in fact operates with the model of an ever-expanding settler colonial state rather than with a Westphalian nation-state model. This might be a lesson not only for historians of IR but also for those in strategic studies who have an interest in the origins and politics of their own ideas.

Though hardly without critics, the belief that consciousness inheres in basic form throughout the cosmos has experienced something of a renaissance in recent years.¹¹⁷ It is in this context that 19th-century panpsychist debates do seem to speak to the questions posed by a second space age in which an enthusiasm for space colonisation has been reignited but in which the limits placed on space travel by the human body have not been overcome. This has given rise to speculation about whether 'personal consciousness could be uploaded into cosmos-colonizing robots, probably into innumerable such galactic probes, and you yourself (or your clones) could colonize the cosmos,' as one popular television producer puts it.¹¹⁸ A universe 'colonized by only mentally blank zombies,' after all, would 'not seem an ultimate good.'¹¹⁹ Tim Marshall too insists that a robot 'cannot tell us how it feels out there and what it's like psychologically to be so far from Mother Earth.'¹²⁰ Cosmic colonisation, Marshall implies, will need to be experienced by flesh-and-bone humans if it wants to be authentic. Here, the ways in which panpsychists and other post-humanists question the distinctness of human consciousness seems relevant. Whilst we have seen that panpsychism is compatible with space expansionism, it is noteworthy that some space colonists, such as the CEO of SpaceX, have spoken out against it.¹²¹

Finally, then, a few words on how our discussion might speak to the current planetary and decolonial moment. It is noteworthy that we have found critics of space colonisation in unexpected places, such as in the work of a Nazi spatial theorist who holds on to *Lebensraum* even after 1945 – which is amongst the reasons why he appeals to the Russian far right to this day. I have also suggested that Schmitt is insincere in his critique and that this insincerity is ultimately driven by the fact that he no longer has a (fascist) dog in the fight that is the space race. This is a point missed by Latour when he uses Schmitt's musings on outer space as a way into the politics of the Anthropocene.¹²² Schmitt's post-war concepts are clearly formed by his frustration over the German defeat in 1945. We might want to bear this in mind before adding him to our growing inventory of space critics.¹²³

We have seen that the case of Ratzel's reluctance to project *Lebensraum* into outer space reveals something else entirely, namely the surprising coexistence of aggressive settler colonialism with a cosmology which deconstructs the kind of binaries through which settler colonialism tends to operate. Whereas the struggle for life is highly bellicose on earth, outer space seems to pacify for Ratzel. Whatever the reason for this tension, it should be clear that ontology does not equal politics

¹¹⁷Keith Frankish and Aeon, 'Why panpsychism is probably wrong', *The Atlantic* (20 September 2016), available at: {<https://www.theatlantic.com/science/archive/2016/09/panpsychism-is-wrong/500774/>}.

¹¹⁸Robert Lawrence Kuhn, 'When robots colonize the cosmos, will they be conscious?', (27 October 2015), available at: {<https://www.space.com/30937-when-robots-colonize-cosmos-will-they-be-conscious.html>}.

¹¹⁹Ibid.

¹²⁰Marshall, *The Future of Geography*, p. 23.

¹²¹The Lex Fridman Podcast, 'Elon Musk: Neuralink, AI, Autopilot, and the Pale Blue Dot', available at: {<https://www.youtube.com/watch?v=smK9dgdTl40>}.

¹²²Latour, 'How to remain human'.

¹²³Tony Milligan, 'Fear of freedom: The legacy of Arendt and Ballard's space skepticism', in Charles S. Cockell (ed.), *The Meaning of Liberty beyond Earth* (Heidelberg: Springer, 2015), pp. 33–45; Columba Peoples, 'Haunted dreams: Critical theory, technology and the militarization of space', in Natalie Bormann and Michael Sheehan (eds), *Securing Outer Space* (London: Routledge, 2009), pp. 91–107.

and that ontology can thus not fix political problems. This should offer a cautionary tale for those in IR who hope to find in monism, hylozoism, animism, or indeed panpsychism the solution to the problems posed by coloniality, whether on or off earth.

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