

Viewpoint

The extraterrestrial Earth: Antarctica as analogue for space exploration

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Abstract

The polar regions have often been suggested as surrogates for the exploration and colonization of space. In particular, Antarctica's greater isolation makes it a useful analogue. Its features—abiotic, acultural, alien to human habitation—all echo the regions of interest to contemporary exploration, notably the solar system and the deep oceans. But more than a century of Antarctic experience also suggests that exploration will likely resemble the Renaissance's Great Voyages and their outposts rather than become portals for wholesale colonization. These sites will traffic mostly in information—the spices and luxury goods of interest to their sustaining societies.

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1. Antarctica as analogue

In 1899, Carsten Borchgrevink led the first party to winter over in Antarctica. He brought with him all he needed, along with two Laplanders (Saami) in the belief that people accustomed to the Arctic could also thrive in the Antarctic. He was wrong. They saw nothing—experienced nothing—that echoed life in their polar Norden, save a long cold winter's night. Antarctica was inextricably different.

The truth is that the Arctic and Antarctic are, in their fundamentals, poles apart. The Arctic is a sea surrounded by land; the Antarctic, a continent surrounded by ocean. But even more pronounced are their divergent human histories. The Arctic is encased by, accessible to, and hence bonded to human history. It has its indigenous peoples, its imperial claims and colonizing epochs, its ancient economies of hunting, fishing and trade. The Antarctic has none of this. No one has ever truly lived there; no enduring natural assets bind it to the world economy; no colonization or claims to sovereignty have global recognition. Its population is scientists; its trade, information; and only an immense expenditure of will and money has forged even these tenuous links. The Antarctic's isolation is so complete that it seems less an intrinsic feature of the Earth than an

extraterrestrial presence accidentally slapped onto the planet's surface.

Its exploration history is likewise singular. It was the last of the Earth's continents to be explored—the last of an extraordinary epoch of exploration that William Goetzmann 20 years ago labeled a Second Great Age of Discovery. From the mid-18th century to the early 20th, geopolitical rivalries and a valence to the intellectual culture of the Enlightenment rekindled European enthusiasm for exploration. This time natural historians rather than missionaries recorded the findings; this time too a vast surge of emigrants transformed Europe's outposts into colonies as settlement societies flourished. If the First Age had been tied with peculiar force to the world ocean, such that circumnavigation was its grand gesture, the Second Age bonded to the continents, and made a cross-continental traverse its most celebrated endeavor. That surge ended on the Antarctic ice sheets. The Arctic explorer, crossing a frozen sea that seemed a surrogate landmass, adapted native technologies, fed on native fauna, and relied on native sledgers. The Antarctic explorer brought everything with him, even as modernism was eroding away the premises of the Enlightenment enterprise like a cultural acid. Here, if anywhere, is a model for space exploration.

The Antarctic became the transition for a Third Age of Discovery. The old practices dwindled to stories of solitary survival and soliloquies, or died out altogether. When exploration seriously revived after World War II, it did so

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in the context of the International Geophysical Year (IGY, 1957–58), which evolved out of a Third Polar Year that had intended to complete the ambitions of the Second Age with modern technology (as the Trans-Antarctic Expedition, outfitted with snowcats, did). IGY served for the 20th century as the international transits of Venus did for the 18th.

But the Third Age has involved still grander realms than ice. IGY was the occasion for Sputnik, and the onset of a superpower space race; the solar system would supplement Antarctica as its realm. Even more, the deep oceans have furnished the silent geography behind a renewed era of exploration. Those dark abysses are the real analogues to interplanetary space. Yet they are all—ice, abyss, space—environs utterly alien and hostile to human presence; and they all mirror the art and echo the self-referential paradoxes of modernism. So while the Third Age has evolved out of the Second, its differences are every bit as profound as its similarities. One need only compare the descent of the bathyscape *Trieste* into the Marianas Trench with the descent of John Wesley Powell's dories through the Grand Canyon, or the Huygens probe to Titan with the arrival of Vasco daGama in the Indies.

2. Antarctica as Third Age terrane

What are the character traits that bond Antarctica, in particular, to the Third Age? It is a place that is isolated, abiotic, acultural and profoundly passive. One goes there in defiance of natural impulses. The scene reflects, absorbs, and reduces, a geophysical and intellectual sink. It takes far more than it gives. With implacable indifference it simplifies everything: that is its essence, the synthesis of the simple with the huge. It reduces an entire continent to a single mineral taller than Mount Whitney and broader than Australia.

The scene acts on people as it does on other Earthly features. There is no genuine society. There are no children, no families, no schools, no social order and no matrix of interlocking institutions. It is more like a mining camp or those shore-based trading outposts typical of the First Age. But worse: at least those in the outposts could intermarry among indigenous peoples, and the resulting *mestizo* societies—pioneered, as so much of European expansion was, by Portugal—did the heavy work of exploring and settling the interiors of South America and southern Africa, and of parts of south and southeast Asia. Exploration meant a transfer of knowledge from one group to another; explorers relied on native guides, translators, hunters, collectors, and they typically adapted native clothing, if not native mores. None of this was possible in Antarctica. Yet without such cultural contact and without a true social setting there could be no great literature or art. (The ultimate Antarctic saga is Douglas Mawson's, slogging along alone across broken ice fields, with no guide and little direction, nothing to record but

conversations with himself, nothing at all but his own will to continue.)

To this sketch there are seeming exceptions. Chile maintains a small army base, complete with families, on King George Island. The Southern Ocean swarms with krill, fish, seals, whales and penguins. There are micro-lichens on some exposed rocks, and bacteria in sandstone, and perhaps under the ice sheet itself. Tourists visit sites on the peninsula annually. But all these activities occur along the continental fringe, or on minor outcrops along the margins or, in the case of the Chilean base, on an island outside the Antarctic Circle (roughly equivalent to the latitude of Helsinki). The social order, often quasi-military, is akin to that of a ship, quite independent of place. Biotic fragments do not make a sustaining ecosystem. The Antarctic analogy only begins when you cross the barrier ice and step onto the ice sheet.

Paradoxically, this existential isolation is good news in that it means that there is, in the Antarctic as throughout the realm of the Third Age generally, an absence of the moral conflict that so stained European expansionism. This is inquiry uncontaminated by imperialism. We might wish to repeat Alexander von Humboldt's descent down the Orinoco, but who would want to replicate Henry Stanley's bloody traverse of the Congo? This blessing comes at a price, however. The absence of moral conflict can also mean the absence of moral drama. What is left is survival, the individual against the elements. We do not need to go Titan or Phobos for that.

Life at the bases is easier now. Email alone has shattered the distance. You can download movies at the South Pole. You can dine on lobster and steak and drink beer. You can come and go by air with little regard for the seasonal tides of the Antarctic ice pack. Yet these stations remain the outposts of an imperial science, trafficking in the luxury goods—the peppers, spices and gems—of an information society. They are not beachheads for wholesale colonization. Inhabitants come and go, almost annually, like migratory flocks or marching penguins. McMurdo is not a Plymouth Colony but a Virginia City, and Pole Station not a St. Louis but an icy St. Helena. And this is what human outposts throughout the solar system would be most likely to resemble.

The geography of the Third Age will be dominated by near-Earth terranes—the upper atmosphere of circling satellites, the deep oceans, the icy sub-worlds of the poles. Its vaunted exploration will happen through remote sensing and robots. Its characteristics will be those of outposts, permanently established but not permanently staffed; dedicated to commodities valued by their sustaining societies, mostly information; bound by technological umbilical cords to their originating cultures. Exploration, that is, will most probably go back to the future. It will more resemble those daring, complex expeditions launched by the First Great Age of Discovery—few in number, far-ranging, not bonded to colonization, a high-tech version of the original Great Voyages without the political and moral

encumbrances that contact between peoples inevitably brings. The requisite rivalry that must power exploration will probably derive from the competitive character of science itself, conducted as a cultural pursuit with national prestige, not national survival, as its payoff. It will mean, in a curiously postmodernist way, talking with ourselves. Such would seem to be the lessons from the extraterrestrial Earth, the Antarctic.

3. Back to the future

If, then, after a century of sustained contact, remote bases remain just that, remote bases, not preludes to mass migration and settlement; if social interest lies almost exclusively in scientific discovery and national prestige, not in a broad-spectrum engagement with the culture; if such Earthly sites demand endless and costly support, unable to grow food crops or even to extract freshwater from sea or ice without imports of oil; if left to their own devices residents sink into semi-hibernation and ritual rather than bustle and bubble over with new ideas; if we can do no more than this with our own planet's polar regions, where

we can actually breathe unaided, then why should we assume that a lunar base or an outpost on Mars should be different? Why should we insist that the survival of humanity depends on the moons of Saturn? Why should we look to outer space to sustain the USA as a 'people of plenty' when that frontier of economic opportunity lies in cyberspace? Why should we expect that interplanetary space will somehow revive the Second Great Age of Discovery and its colonizing swarm over the Earth?

I do not know why, because, whether we like it or not, the recent past suggests a very different future. If you want to imagine the next century of exploration throughout the solar system, look to the last century's experience in Antarctica.

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