

The first part of the book answers the question ‘Whose Arctic?’ by constructing Arctic politics through claims of knowledge. Annika E. Nilsson, Swedish freelance journalist with experience in the science-policy interface in the Arctic, describes why the changing Arctic climate is more than just weather. Today not only ‘quality in theory and methods’ counts, but also the person, ‘who is allowed to participate in knowledge making’ (page 28). Thus indigenous knowledge becomes increasingly important for academic science.

Jessica Shadian investigates the global political change in looking at the history of the IPYs, revisiting politics and science at the poles and analysing the IPY and the governance of science. She presents the role of the science community, indigenous political actors, and private industry and concludes that the recent IPY occurred ‘at a critical juncture in the history of Arctic and global politics’, when it ‘set out to understand climate change’ and at the same time was ‘a noteworthy player in the history of changing Arctic politics and the overall narrative of an emerging post-Westphalian system’ (page 56).

Rob Huebert, associate professor in the Department of Political Science, University of Calgary, Canada deals with science, cooperation and conflict in the polar region. He shows that science in polar regions is not value free and that ‘Science itself does not lead to better international cooperation’ (page 70). Instead, the conditions leading to cooperation have to be examined in the same detail as the physical transformation of the Arctic due to climate change. However, this was not done during the recent (4th) IPY, in which proposals referring to such themes were mostly not funded.

Urban Wråkberg looks at IPY field stations, their functions and meanings in context with the surrounding landscape and international politics. 13 pictures illustrate the variety of stations from the 1st IPY (1882–1883) to the recent NATO surveillance radar station in Vardo (Norway). They ‘relate to their locations on both a micro socioeconomic level as well as an intermediary level of landscape and region’ (page 78). Their choice is often determined by ‘official national “zones of interest”’. In contrast to this, the Antarctic Treaty and the cross border communities of indigenous people blur the idea of political sectors (page 94), which dominates national claims in both polar regions.

The second part of the book deals with the question ‘Whose environment?’ and focuses on science and politics in Antarctica. Julia Jabour teaching Antarctic law and policy in the Institute of Antarctic and Southern Ocean Studies, University of Tasmania, Australia and her colleague Marcus Haward, associate professor in the School of Government and Institute of Antarctic and Southern Ocean Studies discuss Antarctic science, politics and IPY legacies. They give a clear and detailed history of the Scientific Committee on Antarctic Research (SCAR) and its role in the Antarctic Treaty System (ATS). The description showing all facets of the role of SCAR reads very well even for non-experts in this matter.

Professor of international law at the College of Law, Australia National University, Donald R. Rothwell reflects 50 years after the International Geophysical Year (IGY), the IPY and the ATS referring to Antarctica as a ‘unique continent because of the enduring significance that is associated with scientific research, . . . , highlighted by the IGY which in turn provided a catalyst for the negotiation of the Antarctic Treaty’ (page 141), while the freedom of scientific research continues until today. Climate change made people aware of the importance of the polar regions and science, law, politics and community became the means to handle it. New ideas on Antarctic bioprospecting and its regulation are discussed in context with the Japanese ‘scientific’ whaling programme.

Consuelo León Wöppke, director of the Hemisphere and Polar Research Center, Viña del Mar, Chile, introduces the formation and context of the Chilean Antarctic mentality from the colonial era through the IGY. She points to the ‘influence of domestic political and scientific factors on Chile’s contribution to the foundation of the Antarctic Treaty’ (page 145) and presents new material in English for the first time ‘to let the facts speak for themselves,’ which is very exciting to read. She comments that until today Chile’s fixation on national sovereignty referring to overlapping Argentine, Chilean and British interests in Antarctica, militated against the establishment of a first class scientific programme as well as international cooperation.

Coordinator of the Centre for the Study of Geopolitics, Panjab University, Chandigar, India, Sanjay Chaturvedi works on the science-geopolitics interface of biological prospecting in the southern polar region. He warns that ‘Commercial competition is beginning to displace scientific cooperation as driver of policy into the region’ (page 187). In his view it appears that the influence of the ATS is decreasing and that power is shifting to commercial enterprises.

In the last chapter Monica Tennberg summarises the different ideas of the book in three spirals of power and knowledge. She concludes that the ‘polar regions are established as “scientific laboratories” and part of global “environmental panopticons”’ (page 190), while emerging biopolitics focus on the manifold conditions which influence human living in polar regions (page 195). The investigation of the use of knowledge referring to climate change in polar regions ‘is a challenging area of study and complex mix of ethical, economic and political considerations’ (page 199). This should be known by policy makers and financial bodies.

This is the first book dealing with the history and legacies of the International Polar Years and more books on this topic will be published in the near future. They will open up a new field of interdisciplinary research, which should be included in national research programmes. (Cornelia Lüdecke, Institute for the History of Science, Mathematics and Technology, University of Hamburg, Germany.)

THE GREAT OCEAN OF TRUTH: MEMORIES OF HUDSON-70, THE FIRST CIRCUMNAVIGATION OF THE AMERICAS. Peter Wadhams. 2009. Cambridge: Melrose Books. vi+378 p, illustrated, soft cover. ISBN 978-190704030-6. £15.99.
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This story of the 1970 expedition of *Hudson* is really a memoir of a young man for whom the voyage was a primer on the

oceans, their science, and the real world of people outside the sheltered life of a Cambridge schoolboy. The tale is told from the standpoint of a ‘young recruit’ to the marine sciences. In 1969, Peter Wadhams was finishing his degree in physics at Cambridge and was looking for a career. Instead he stumbled into an adventure of a lifetime. It happened that he attended a lecture by geophysicist Edward Bullard on seafloor spreading, and asked him for a job. Bullard declined but recommended Wadhams contact a Canadian, Bosco Loncarevic, who worked at the Bedford Institute of Oceanography, in Nova Scotia. The

end result was that Loncarevic asked the young Wadhams to take part in the *Hudson-70* expedition. It seemed that no one wanted to stay aboard for the entire trip, around both of the American continents, and Loncarevic needed a junior person aboard to keep records and make sure there was some continuity in measurements. Should he accept the post, Wadhams would be forced to endure the voyage the whole route, as it travelled the oceans and visited Rio de Janeiro, Buenos Aires, Antarctica, Tahiti, and other locales that others might spend their whole lives only dreaming about. The result was not only a scientifically interesting voyage, but also it was the start of a strong scientific career for Wadhams, and an eye-opening personal journey.

Those interested in the history of oceanography should approach this account with caution. It is organised logically, following the route of the ship itself, and its chapter titles helpfully call to mind the location in question. But this is where the logical coherence ends. Although Wadhams is full of humour, and his tale is often colourful, there is not much binding the narrative together. The title, *The great ocean of truth*, has little bearing on the expedition itself, but is a reference to a quote from Isaac Newton, who had written that 'the great ocean of truth lay all undiscovered before me.' Wadhams does not dwell on particular scientific questions, or on any particular issues at all. Most of the book is a highly detailed account of the comings and goings of young Wadhams, with fleeting reference to the scientific work being done by others on board. Although readers will learn a little about echo sounders and the importance of the Antarctic Convergence, they will have to find these nuggets hidden in passages that describe anything and everything, whether it is going to a bank to exchange money or visiting a house of ill repute with the lads. It is obvious that Wadhams either has a memory like a steel trap, or he kept an extraordinarily detailed diary. Despite the benefit of some critical distance, his descriptions of the people he met are very much from the perspective of an impressionable young man.

Perhaps understandably, the early chapters tend to be heavy on descriptions of tourist attractions and local people, particularly in the quest for female companionship, as the expedition traveled in South America and stopped in Brazil, Argentina, Chile, and Peru. But also we have Wadhams providing fascinating descriptions of the Chilean fjords, and the strange oceanographic phenomena that accompany them. To one who knows nothing of fjords (including this reviewer), it is useful to encounter the weird sloshing of water through the eyes of young Wadhams, and to experience their puzzling dynamics vicariously. It is equally helpful to have them explained by the mature Wadhams.

Since the great expanse between Peru and Vancouver was interrupted only by a brief interlude in Tahiti, Wadhams devotes more attention here to the scientific work. At first they headed southwest to reach once again the cold and turbulent Antarctic. The crew hauled out the magnetometer, gravimeters, and expendable bathythermographs, and put the echo sounder into full use again. The gravimeters would help scientists, led

by William von Arx, to discern a somewhat clearer picture of the shape of the earth itself in the Pacific. Of all the scientists who worked on *Hudson*, Wadhams writes, Von Arx 'alone possessed all the characteristics of nobility,' and appreciated to his shipmates as one who had an extraordinary breadth of knowledge in science and culture (page 241). His work was in part designed to help calibrate a new mode of earth observation: satellite oceanography. This was in the era when dreams of a devoted oceanographic satellite overstepped the reality. Seasat, which was to draw from *Hudson's* work, was delayed until 1978, and even then it failed a few months after launch. The *Hudson's* gravimetric work would not really become crucial for satellite oceanography until the 1990s. But the *Hudson* made other notable measurements with the echo sounder: in an area previously thought to be fairly uniform, it measured a mountain (Hudson Peak) and a trough (Hudson Deep).

In a chapter called 'A geophysical interlude,' Wadhams provides more of a taste of the scientific import of the voyage. By 1970 the theory of plate tectonics, having passed from its previous incarnations of continental drift and seafloor spreading, had only recently been proposed in a comprehensive way, as a system of crustal blocks interacting on the surface of a sphere. Three of these blocks, or plates, joined together off the west coast of Canada (Juan de Fuca, American, and Pacific plates), making it a particularly interesting site for taking measurement of gravity, magnetism, seismic refraction and reflection, and heat flow. The seismic work helped to determine how the crust moved in relation to the mantle below. The heat flow measurements were abnormally high, and several years later scientists determined that the *Hudson* must have been moving over some active hydrothermal vents.

The voyage turned out wonderfully for Wadhams. Aside from tasting life at sea, he got to know von Arx a little, and learned to appreciate wide-ranging ideas, rather than what Wadhams considers the narrow specialisations of today's oceanographers. Wadhams sees the *Hudson-70* expedition as the last of the great oceanographic voyages, part of a dead tradition that began with the *Challenger* in 1872. That may be, though Wadhams was probably one of a select view who saw it that way, since he was there for the duration. Scientists were able to fly in and climb aboard for discrete legs of the voyage.

As a memoir, *The great ocean of truth* is a fun jaunt through the past, and it helps to put human faces on the story of a scientific cruise. As history, its contextualisation is understandably anecdotal. Some may find it jarring to read Wadhams conflating Alfred Wegener's 1910s theory of continental drift with the 1960s ideas of seafloor spreading, which have very different conceptual bases. As a record of the voyage itself, it succeeds admirably in taking in some of the science, and some snapshots of the western hemisphere's ports-of-call, seen from the perspective of a ship full of men doing science and having the time of their lives. (Jacob Darwin Hamblin, Oregon State University, Department of History, 306 Milam Hall, Corvallis, OR 97331-5104, USA)

INNOCENTS IN THE DRY VALLEYS: AN ACCOUNT OF THE VICTORIA UNIVERSITY OF WELLINGTON ANTARCTIC EXPEDITION, 1958–1959. Colin Bull. 2009. Wellington: Victoria University Press. 267 p, illustrated, soft cover. ISBN 978-0-86473-594-2. NZ\$50.

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The dry valleys of Victoria Land are one of the best known and strangest places in Antarctica. They were discovered, but not explored, by the *Discovery* expedition in 1903. Although surrounded by glaciers, the valleys have remained ice free for