

statisticians, and from 1964 the Food and Agriculture Organization of the United Nations (FAO) played an increasing part, and all concurred in demanding smaller catches. As the economics of the industry worsened, nation after nation withdrew so that by 1973 only Japan and the USSR were left. Even then, the reduced fleets could not catch the unrealistic quotas allowed by the IWC.

By then the political tide had turned. In 1972 the United Nations Conference on the Human Environment at Stockholm passed a resolution demanding a 10-year moratorium on commercial whaling. The United States, United Kingdom, and others supported the proposal. The IWC responded by adopting a New Management Procedure (NMP), followed by a Revised Management Procedure (RMP) in 1975–76. The latter, at last, treated uncertainty as grounds for more rather than less protection. But it came too late. An increasing number of non-whaling states acceded to the ICRW and supported a moratorium. It was adopted in 1982, against the opposition of Iceland, Japan, the Republic of Korea, Norway, Peru, and the USSR. All except Iceland and Korea lodged objections, and were hence legally entitled to continue whaling, although pressure from the US brought a halt to Japanese activities except as so-called ‘scientific whaling’ in 1988.

This book examines the whole sorry but fascinating tale in great detail. It limits itself to the hunting of baleen whales in Antarctic waters because this accounted for the greater part of the global whaling industry. It focuses on the proceedings and decisions of the IWC, and especially on how the scientific advice it received was formulated, how far it was truly independent of national commercial interests, and on how uncertainty was used to set aside scientific advice that would have imposed economic loss. Its central thesis is that science has little hope of determining policy when decisions rest in the hands of delegates governed by national self-interest, and that when economics and science conflict, economics wins every time. Its sub-plot is that uncertainty has been used to support radically different arguments, as the tide of political advantage turned. As the author says, ‘it is not uncertainty itself that determines or influences policy making so much as how we choose to use it — and that is ultimately determined by political choices about what is or is not desirable.’

Critics may argue that the book concentrates too much on the official record and gives insufficient credit to the world conservation movement, which brought increasing political pressure on governments in the 1970s. The discussions in IUCN (The World Conservation Union), of which most ICRW parties were State Members, are not mentioned, yet from 1978 onwards it supported both a moratorium and the work of the IWC’s Scientific Committee. ‘Protectionist’ arguments, fuelled by public wonder at modern films and sound recordings and by ‘whale watching’ and also by evidence that the methods of killing whales are inhumane, receive scant attention. Some scientists who have acted as advisers to government

will also feel that the book is unfairly dismissive of their influence. Nonetheless, it is a valuable record and analysis of the lamentable failure of what should have been a model international regulatory instrument.

It is clearly written, fully referenced, and well indexed. It will be useful to polar historians, but also to students of environmental policy more generally and to those seeking reasons for distrusting governments. Scientists who already look sceptically at economists will find grounds for even deeper scepticism. Conservationists may regard it as a Solemn Warning. But all should be grateful to the author for setting out his arguments — and his evidence - so clearly. (Martin Holdgate, Fellbeck, Hartley, Kirkby Stephen, Cumbria CA17 4JH.)

DEEP FREEZE: THE UNITED STATES, THE INTERNATIONAL GEOPHYSICAL YEAR, AND THE ORIGINS OF ANTARCTICA’S AGE OF SCIENCE. Dian Olson Belanger. 2006. Boulder, CO: University Press of Colorado. xxxiv + 494 p, illustrated, hard cover. ISBN 0-87081-830-9. \$US29.95. doi:10.1017/S0032247407006869

Dian Olson Belanger’s history of the 1957–58 International Geophysical Year (IGY) in Antarctica and the US military’s ‘Deep Freeze’ operations that supported it is a highly informative and readable narrative account of perhaps the single most striking international scientific endeavour of the twentieth century. That the IGY emerged from and was implemented by an international community riven by Cold War tensions and rivalries makes the story all the more remarkable.

The IGY was, from the beginning, an often-tense mix of science, exploration, occupancy, strategy, and politics. Its decentralised nature (relying exclusively on national programmes), the increasingly obvious value of suspending political rivalries between claimant and non-claimant states, and the small, inexpensive bureaucracy (CSAGI) that assisted in programmatic coordination and data exchange substantially abraded the rivalries and suspicions that each participant brought to the enterprise. As the global value of Antarctic research became obvious, the way was paved to an international treaty ‘based on the scientific cooperation of the IGY’ (page 371). That instrument guaranteed to the present day Antarctica’s unique status as, in effect, a world park beyond and separate from an international community that remains committed to the maintenance of its unique peaceful status.

Five themes dominate and structure the book. First and foremost is the recurrent friction between the US Armed Forces charged with logistically supporting the IGY and an Antarctic scientific community chronically suspicious and fearful that the service people, and the Navy in particular, were pursuing their own separate and antithetical agendas. Such fears were not groundless. Some in the Navy wanted to use the IGY as a front or cover to pursue strategic interests, including further

cold-weather training, mapping, and especially exploration for important minerals. Admiral George Dufek, Deep Freeze commander during the IGY, proved to be deeply committed to the IGY. But during the critical build-up period, he 'always...focused on the establishment and safe maintenance' of each of the seven US scientific stations scattered around the continent. Worrying about the scientific programmes of each station 'could come later in his view,' and as a consequence, scientific equipment 'became the last priority' (page 175). Early misunderstandings and suspicions led to several wounding incidents, notably Dufek's insistence that only naval personnel would make the first aerial landing at the South Pole, excluding long-time Antarctic scientist Paul Siple from sharing in the glory (page 159).

The second theme revolves around the widespread fear within the Antarctic community that Moscow might dominate the IGY with all the strategic and political implications involved. Soviet occupation of the most valuable portions of the continent, particularly the Pole itself, could not be discounted. Only the Americans possessed the treasure and resources to deflect such a possibility. Belanger tells in suitably dramatic terms the story of what it took to enjoy the 'political and emotional coup' of getting the United States established at the geographic bottom of the Earth (page 186).

Third, America's IGY servicemen and scientists were able to exploit the lessons of a decade's work in the Arctic, especially Greenland. Belanger might have laid a bit more emphasis on the construction of the Distant Early Warning [Radar] Line across Arctic Alaska, Canada, and Greenland during the summers of 1955 and 1956, which provided the icebreaker navy (including this reviewer's ship, *Staten Island*) with invaluable experience in what was characterised at the time as 'ice seamanship.' But she does recount instance after instance where Arctic-trained people and Arctic lessons were enlisted with great success to resolve Antarctic problems.

A fourth, largely implicit, theme is the striking similarities between the IGY and earlier Antarctic expeditions, especially those of Admiral Richard E. Byrd. The IGY programmes that developed during and from Deep Freeze I and II were in many, if not most, respects logical continuations of Byrd's two private expeditions between 1928 and 1935, his personally directed US Antarctic Service Expedition of 1939–41, and Operation Highjump, 1946–47, in which he was overall commander. The use of aviation support; the establishment of weather and relay stations, together with emergency caches of food and fuel at various points at the foot of the Transantarctic Mountains; the establishment of supply caches on various trails; and, indeed, the very notion of surface 'traverses' to do on-the-ground science were either developed or greatly elaborated by Admiral Byrd and his colleagues. Only in three instances did the early Deep Freeze operations break more or less decisively with the past. By 1956, the usefulness of dog teams for Antarctic transportation was clearly at an end, as motorised, tracked vehicles now

possessed far greater power if not reliability. Aircraft, too, had reached sufficient size and reliability so as to become essential elements in the construction of 'inland' stations, including Byrd and Scott-Amundsen at the South Pole. Finally, the pressing matter of liquor and drunkenness, which had be-deviled Byrd on his two private expeditions, was largely, though not completely, dissipated throughout the Deep Freeze years by the presence of naval officers charged with enforcement of a strict 'uniform code of military justice.'

From beginning to end, the success of the US IGY programme depended on cooperation among a remarkable group of men. Initially often at cross purposes, Larry Gould, Paul Siple, Lloyd Berkner, Hugh Odishaw, Harry Wexler, Albert Crary, George Toney, Dick Bowers, George Dufek, and a host of others in Washington and on the ice were all committed to making the US IGY a success. An increasingly bewitched Congress and a clear-eyed President Eisenhower added critical support. Skill, grit, self-discipline, and restraint were the chief qualities that carried individuals and groups through to remarkable success during and after IGY.

Any good story or set of stories has to have a villain, and in this instance, Finn Ronne, the sole base commander at Ellsworth Station and a turbulent, mistrustful character, fills the bill. Censoring all outgoing communications, even of the most personal kind; preventing some men from direct contact with the outside world as a form of 'punishment' for perceived slights or infractions; denying a deep traverse party critically needed radio equipment because he had not received explicit permission from Dufek, Ronne comes across here, and elsewhere (see Behrendt 1998; Passel 1995) as a petty martinet more to be pitied than censured, although living with him was evidently hell.

Belanger concludes her tale with a riveting account of the often tense and stressful negotiations among the 12 nations that ultimately created an enduring regime for Antarctica, then goes beyond the 1961 Treaty to outline the political and scientific history of humans in Antarctica to the present day. In so doing, she makes a signal contribution to the slowly developing scholarship on polar, and especially Antarctic, history. Thanks to her work, we now have an essential link between the Heroic Age of dashing adventure and small science and the contemporary era of permanent occupancy and probing inquiry across the entire spectrum of Earth and atmospheric sciences. (Lisle A. Rose, Edmonds, Washington.)

References

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