

pages of text represents a challenge that few scholars would have the temerity to tackle. Richard Vaughan is one of those few, and the result of his efforts is a masterpiece of selection, organization, and synthesis. What is immediately evident is that such a challenge could have been successfully met only by a scholar with Vaughan's impressive command of languages: Dutch, Norwegian, German, and Russian sources are incorporated into the fabric of the book with consummate skill.

One is immediately struck by the fact that the scope of the book is much wider than that of a traditional history of 'exploration' and 'discovery' by incursive Europeans. Many of the traditional ingredients — such as the Royal Navy's search for the Northwest Passage (and, after 1847, for the missing Franklin expedition), the Russian expansion across Siberia and to its Arctic coast, and, a century later, the Russian Navy's remarkably successful Great Northern Expedition — are covered succinctly yet convincingly. But Vaughan also includes important aspects of economic and social history. Thus, one of his most useful contributions is his excellent coverage of Arctic whaling in the late sixteenth and early seventeenth centuries, particularly by the Dutch around Svalbard, where Smeerenburg has long been thought to have been a seventeenth-century whaling metropolis. As Vaughan reports, however, recent Dutch excavations have 'cut Smeerenburg down to size,' revealing it to have been 'more like a typical Dutch single-street village' (page 86) and only a seasonal settlement. From these beginnings, Vaughan follows the history of Arctic whaling in the North Atlantic, Baffin Bay, Hudson Bay, and the Beaufort and Chukchi seas to its last gasp in Hudson Bay around 1915.

Other chapters focus on the impact of the Hudson's Bay Company and, from a much earlier date, that of the Royal Greenland Trade on the inhabitants of what are now the Canadian Arctic and Greenland. Elsewhere the significant contribution of shipping to the development of the Russian and Siberian Arctic is recognized through a thorough discussion of the development of the Northern Sea Route, under both tsarist and Soviet regimes. Yet another refreshingly different aspect of the content is the chapter on the search for minerals, from the Klondike to Prudhoe Bay and the Yamal Peninsula, and its impacts, positive and negative, on the peoples of the Arctic and the environment.

A particularly refreshing feature of the book is the emphasis on the place of indigenous peoples in the history of the Arctic. It opens with a review of the indigenous peoples around the Arctic at the time of first contact with Europeans (that time varying in each case), and ends with the settlement of the Nunavut land claim and with the optimistic note that this and other recent developments whereby the indigenous peoples have been making progress towards claiming 'what is rightfully their own' will 'remove definitively the threat of their extinction' (page 289).

When the canvas has been painted with such a broad brush, it is inevitable that minor errors have crept in, but these are surprisingly few in number and do not affect the

general thrust of the arguments. One might fault Vaughan, for example, for the remark that the three members of Andrée's disastrous expedition in the balloon *Örnen* 'were entirely without experience of travel and survival in the Arctic' (page 194), whereas Andrée had in fact been a member of the Swedish expedition to Kapp Thorsden, Spitsbergen, as part of the International Polar Year in 1882–1883; one might, however, argue, in support of Vaughan's statement, that such an Arctic experience did not necessarily contribute to his skills at either survival or travel. Elsewhere Vaughan suggests that Roald Amundsen's passion for aviation dated only to the period of the *Maud* expedition (1918–1921), whereas in fact he had obtained his pilot's license in 1914 in preparation for using aircraft on a planned drift across the North Pole in *Fram*, on the same day as Wilhelm Filchner, the German Antarctic explorer who was also to participate in the expedition. Undoubtedly some readers will fault Vaughan for casting his vote in favour of Peary in the long-running debate as to whether he reached the North Pole or not. In this connection this reviewer would only fault Vaughan for devoting so much valuable space on an activity and a debate that are so peripheral to the real theme of his book, namely the history of the peoples of the Arctic.

Vaughan's book will be invaluable in the classroom and for the general reader, as a sound, comprehensive, and succinct source on the history of the Arctic. To more specialized readers, its value lies in its magnificent, up-to-date bibliography, containing more than 850 citations. (William Barr, Department of Geography, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0, Canada.)

CLIMATE SINCE A.D. 1500. R.S. Bradley and P.D. Jones (Editors). 1992. London and New York: Routledge. xv + 679 p, illustrated, hard cover. ISBN 0-415-07593-9. £85.00.

A basic premise of this book is that the Earth's climate system responds to continuing 'natural' forcing factors, as well as to recent anthropogenic effects. Further, the climate has exhibited significant variability during the past few hundred years, a time period through which human interference was small, relative to the last century. In order to understand the possible effects of recent human activity on future climate, as much as possible needs to be known about natural variability and its causes, because this forms the underlying climate on which anthropogenic effects are superimposed.

The volume is restricted to climatic variations during the last 500 years, a period that, the editors point out, encompasses the bulk of the 'Little Ice Age' and its termination, together with a period of unusual sunspot activity in the Maunder minimum (1645–1715). It is also the period of Earth's history for which the most comprehensive climate records, in both the temporal and spatial domain, can be constructed. Climatic evidence was selected by the editors on the basis that the source had a temporal resolution of one year or better. This not incon-

siderable restriction meant that three basic data sources became the focus for major parts of the book: historical documentary records, tree ring data, and ice cores. Appended to these three parts is a further section on the causes of recent climate change that may act to force the documented climatic trends presented in the bulk of the volume.

There are several papers within the book that concern the polar regions, together with ice-core records from other areas. Chapters by Catchpole and Ball use archives from the Hudson's Bay Company for the eighteenth and nineteenth centuries to reconstruct sea-ice conditions and temperatures for this region of the Canadian Arctic. The records suggest that sea ice was most severe in the 1810s and 1840s. It should be noted that the latter decade corresponds with Sir John Franklin's ill-fated search for the Northwest Passage some 15° to the north.

Ice-core records from the archipelagoes in the Eurasian Arctic sector (Svalbard, Zemlya Frantsa-Iosifa, and Severnaya Zemlya) are discussed by Tarussov, presenting a useful summary of Russian work in this area. Detailed climate records are largely absent from this region of the high Arctic, which is arguably more sensitive than any other at this latitude (about 80°N) due to its location at the northern extremity of heat transfer from the North Atlantic Drift. Tarussov points out that relatively high temperatures in the Eurasian high Arctic, compared with similar latitudes in Canada, Greenland, and Antarctica, make chronological control and climatic interpretation from these ice cores particularly difficult. This is because the vertical movement of meltwater and associated solutes tends to remove the annual signal. The proportion of ice formed by melting and subsequent refreezing is used to reconstruct former climatic conditions in these ice cores through the analysis of ice crystallography and density. A chronology is provided by the thinning of ice layers with depth. However, this assumes that accumulation is independent of time, which is unlikely, and the dating of ice cores from the Eurasian Arctic sector remains equivocal and a constraint on environmental reconstruction.

By contrast with the Eurasian Arctic, high-altitude, low-latitude ice-core records from the Peruvian Andes and the Tibetan Plateau preserve a clear annual layering, identifiable in isotopic and particularly microparticle records. Thompson's work provides both excellent chronological control and a clear climatic signal, especially since it represents the analysis of several independent parameters on multiple cores from each site. A significant product of this accurate dating is that it has shown that the termination of colder 'Little Ice Age' conditions at the Quelccaya ice cap, Peru, occurred very rapidly over a two to three year period centred on 1880. Chapters by Peel and Mosley-Thompson, on ice-core records from Antarctica, show significantly different isotopic records between cores, suggesting regional anomalies during the past few hundred years. The Antarctic Peninsula provides the most complex records, due to its lower latitude and more sensitive location. Peel makes the important point that both stable

oxygen isotope and deuterium isotope measurements are required, because light isotopic events may be related to variations in the amount of open water present in the Weddell Sea, as well as to temperature trends. Each of the chapters on the derivation of recent climate trends from ice-core records suggests that interpretation is not straightforward and that an approach involving several measured parameters is important.

Several chapters in the volume deal with the forcing factors that may be responsible for climatic variations. Quinn and Neal present the historical record of El Niño–Southern Oscillation (ENSO) events from 1525 AD, restricting their definition of El Niño to environmental effects in southwest Ecuador, northwest Peru, and their offshore waters, rather than including broader scale phenomena such as pan-Pacific pressure anomalies. This chapter represents a particularly valuable data source, since it is now recognised that ENSO events have climatic effects throughout very large areas of the globe. The links between explosive volcanic events and climate are considered by Bradley and Jones. They point out that the most complete records of major volcanism since 1500 are from Iceland and Japan, in part because such phenomena have been studied in most detail in these areas. They conclude that important gaps are present in the record of this significant climate-forcing factor, and that studies in the Aleutian arc and Kamchatka would go some way to completing current knowledge for the northern hemisphere.

The final chapter of the volume presents a series of reminders on the limitations of climatic reconstructions using various sources. There is still an acute lack of spatial coverage of climate change in the tropics and in central Asia, and for many regions, particularly in the southern hemisphere, it is impossible to reconstruct an instrumental record of climate change into the nineteenth century. It is also instructive that, even across Europe, climate trends since 1500 are not necessarily synchronous. Nor is the 'Little Ice Age' consistently cold. Decadal variations between very cool and relatively warm conditions took place, with the seventeenth and nineteenth centuries apparently the coldest. There is also a relatively poor correlation between the European record of climate change during the last few hundred years and that from areas such as China. Jones and Bradley, in their concluding chapter, state 'There is no evidence for a world-wide, synchronous and prolonged cold interval to which we can ascribe the term "Little Ice Age".'

In summary, this book presents a number of studies utilizing three major high-resolution tools for the understanding of recent climate change. The editors provide very useful introductory and concluding chapters, which set the more detailed contributions within a more general context. A minor criticism is that the presentation of abstracts to accompany each paper would have been a useful addition. By contrast, the inclusion of a fairly detailed index enhances the utility of the book. It is a volume that I enjoyed, but its mix of papers and its price

make it a book for the library rather than for the individual. (Julian A. Dowdeswell, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

THE COLLEGE HILL CHRONICLES: HOW THE UNIVERSITY OF ALASKA CAME OF AGE. Neil Davis. 1993. Fairbanks: University of Alaska Foundation. x + 627 pp, illustrated, hard cover. ISBN 1-883309-01-8. US\$30.00.

The College Hill chronicles is a partial history of the University of Alaska, Fairbanks, from its conception and founding in 1915 to the installation of Ernest Patty as president of the University in 1953.

The author, Neil Davis, is a geophysicist who took his undergraduate degree at the University, enrolling as a freshman in 1950. He tells of arriving from his parents' Alaska homestead and sensing an 'undercurrent of discord' on the campus. After his retirement from a long career as a geophysicist, he returned to pursue the history of the institution and its people, and to examine the conflict he sensed in his department as a young student in the early 1950s.

Davis opens his book with a brief discussion of the prehistory of the land where the Fairbanks campus was built. The book suffers from an apparent impulse to include every fact or opinion that is available from any source. The author had access to private papers of several of the principal players in the story and his own personal accumulation from the lifetime habits of a packrat. Davis does not claim to be a historian, and the book suffers from a lack of focus and meandering writing.

The conflict that Davis sensed on arrival at the University was the fight after Terris Moore succeeded Charles Bunnell as president. It was also the power struggle between those two men when Bunnell was named president emeritus and allowed to stay on into Moore's tenure. Moore initially suggested that Davis write the book, and gave him full access to his personal papers. The conflict these men and their supporters experienced is presented in minute detail. This book is a case study that supports the observation of Henry Kissinger to the effect that, 'Academic politics are so vicious because the stakes are so small.' There are certainly other stories to be told about the University of Alaska system, but this book stops at the end of Moore's term.

Davis employs an overwrought writing style that cries out for an editor. For example, he describes *fata morgana* thus: 'Adjacent mountaintops reach out to kiss, then coyly jump back and make strange faces at each other or disappear altogether' (page 4).

He dismisses complex matters out of hand, such as, 'Over the coming years the missionaries would receive much blame for helping to destroy Alaska's Native cultures, but the missionaries did work that bettered the lives of the Natives, particularly by providing education and health care. In addition to their aid to the welfare of the Natives, the missionaries realized that effective medical

care was a means of breaking the shamans' spiritual hold over the people. The missionaries did what they could, yet they were few in number, so the Native population continued to decline, racked by severe epidemics of infectious disease that neither the shamans nor the missionaries could combat' (page 11). Davis ignores the effects on Native children of forcing them to stop speaking their own languages and to feel shame for their traditional beliefs. He implies that missionaries were a seamless whole, and that they could have stopped the decline in Native population, if only there were more of them.

Unfortunate references to native Alaskans appear in the text, such that in his discussion of the Klondike gold rush, in which he opines that, 'the Natives perhaps were restless, but certainly suitably subdued' (page 14), and states that Chief Charley of Charley River thought that Judge Wickersham, the University's first president, was 'truly...a big chief' (page 24). He states that the 'non-Native population in Wickersham's district was 1500' (page 23). The reader is not told how many Alaska Natives lived in the district. If that statistic is not available from any source, then that fact is noteworthy in and of itself. However, the reader does not learn whether Davis did not find out or if the numbers were not kept for Alaska Natives.

Davis does not single out Alaska Natives. Many people are categorized without supporting evidence. For example, 'critical for a research organization is the ability to make its own financial decisions. The director and his or her staff should make those decisions — not a comptroller across campus who is hired for his accountancy rather than decision-making skills' (page 466). There is certainly a story here of an old grievance, but it is not necessarily a universal truth that comptrollers can't have skills in decision-making.

Although Davis tells us early on that he is no historian, he has taken on the historian's task in this lengthy book about a brief period in the University's history. His prejudices are obvious. This book is really a memoir as told by Davis. It may be the last word on this old conflict, because most of the players are gone, and few people would care to re-engage the fight. (Barbara Hodgin, 100 East Cook Avenue, Anchorage, Alaska 99501, USA.)

MOMENTS OF TERROR: THE STORY OF ANT-ARCTIC AVIATION. David Burke. 1994. London: Robert Hale. 320 pp, illustrated, hard cover. ISBN 0-7090-5309-6.

David Burke is an Australian journalist with three Antarctic assignments to his credit. In 1964, at the invitation of US 'Operation Deep Freeze,' he accompanied the first direct flight from Melbourne to McMurdo. Following a successful air drop over Amundsen-Scott Station at the South Pole, the ski-equipped Hercules transport plane experienced problems while attempting an unscheduled landing at Byrd Station with falling cabin pressure and a critical shortage of fuel. To cap it all, the plane's forward landing gear iced up. A crash landing seemed inevitable,