

system in sea ice; and the rheology of ice. Chapter 3 introduces the equations of continuum mechanics, which are vital for understanding the remainder of the book. Linear elastic and viscoelastic equations are given for the response of thin and thick plates on a fluid foundation.

Chapter 4 deals with historical (that is, before the work of the book's authors) attempts to solve the problem of the disturbances caused by moving point or line loads on floating elastic sheets. It begins with the equations for a freely propagating wave (the flexural-gravity wave), and goes on to consider forcing by different types of loads.

In this chapter the work of a pioneer in the field is unjustly neglected. Sir George Greenhill derived the equations for the dispersion relation of flexural-gravity waves in a floating ice sheet as early as 1887, as is mentioned in the book (in fact, the equations were slightly erroneous in that the effect of Poisson's ratio was left out of the flexural rigidity formula). However, in a later and uncited work, Greenhill took the subject much further and dealt with the topic of moving loads. The paper, which still repays study, was called 'Skating on thin ice' and was published in *Philosophical Magazine* in 1916 (31 (181): 1–22). The paper begins in an apparently jocular vein: 'This title is used metaphorically to describe a method of argument which flies so rapidly over the facts as to be able to dispense with their support, but will not bear to be arrested to examine a detail or difficulty.'

It proceeds more seriously: 'It is derived from the action of a skater, when he is able to go so fast over ice as to ride on the top of a wave, and to change his place so rapidly as not to allow time to break through, although the ice is not thick enough to support his dead weight at rest.'

This is a succinct statement of the moving load problem, and, indeed, before the mechanical age, the majority of fatalities from ice fracture induced by a self-created wave were probably among skaters and dog-sledge drivers. Greenhill correctly draws an analogy between the flexural-gravity wave in ice, in which the dispersion relation contains two branches due to gravity and to the elasticity of the ice, and the dispersion relation of ripples in open water, where gravity and surface tension provide the two branches of the curve. In both cases there is a minimum in the dispersion relation, that is, a minimum phase and group velocity for a wave propagating in this medium. The group velocity minimum represents a critical minimum speed for energy to propagate in the ice sheet, and all the mathematical treatment of the problem really consists of examining the ways in which waves of different patterns are induced by different magnitudes and speeds of forcing by a moving load. In every case, the critical speed has to be exceeded before freely propagating waves can be generated. Thus, when the wind blows over ice, it has to exceed this critical speed before the moving pressure fluctuations will generate a wave spectrum. As Greenhill puts it: 'A skater, then, who can progress up to this minimum value of  $U$  and beyond, is able to place himself at will at any point of the ice-wave he forms, say a little beyond the crest, so as to have the advantage of the down-

hill; and if the ice should crack he will be able to escape.'

Chapter 5 introduces new material based on work by the authors and contemporaries, in which the wave patterns produced by different types of load moving at different steady speeds are properly derived. The treatment is extended to viscoelastic ice to allow for decay of the emitted waves, to ice of finite thickness, to distributed loads, and to vibrating loads. This is the core of the book.

Experiments to measure the effects of moving loads are described in chapter 6. Strainmeters and tiltmeters in various arrays have been used to measure deflections due to train and truck passages and to aircraft landings. Good coincidence between observations and theory is demonstrated. In a final chapter, the effect of varying the ice properties is discussed. Again, it is not a new problem that some of the fundamental properties of ice — such as Young's modulus — are very variable (especially for sea ice, where all properties are a function of the salinity, temperature, and air-bubble content) and are often not known well enough to allow the theory to give good predictions. Greenhill complained that: 'Neither  $E$  [Young's modulus] nor  $W$  [longitudinal wave velocity in ice] is given numerically in the list of Everett's 'Units and Physical Constants,' or in the 'Smithsonian Tables of Physical Constants' either, although it is curious...that Ice was the first substance of which the Modulus of Elasticity was defined and measured by Bevan and Young [1826].'

The reader who is interested in solving engineering problems of floating ice-sheet response to moving loads will find all that he needs in this excellent book. One very closely related area that the authors might have conveniently dealt with is the question of how waves are generated in floating ice sheets by the wind. It has been found by careful long-term experiments on fast ice that the wind cannot generate waves until the critical speed is exceeded, as in the case of moving loads, but, throughout the Arctic and Antarctic ice covers, there is usually a background spectrum due to the generation and propagation of wind waves. This raises the problem, as yet unsolved, of exactly what pattern of moving pressure fluctuations is associated with a wind field and how this transfers energy to the ice. It is a problem of fundamental interest because the mechanism of wave generation in the open sea by wind is itself not fully understood; in many ways, ice offers a simplified system in which short steep ripples cannot be generated, so there is no 'push' of the wind against inclined water surfaces to produce wave growth, just the vertical pressure fluctuations on a flat surface. (Peter Wadhams, Scott Polar Research Institute, University of Cambridge, Lensfield Road, Cambridge CB2 1ER.)

**WHEN THE WIND WAS A RIVER: ALEUT EVACUATION IN WORLD WAR II.** Dean Kohlhoff. 1995. Seattle: University of Washington Press. xvi + 234 p, illustrated, hard cover. ISBN 0-295-97403-6. \$US24.95.

The book, written by a historian whose speciality is modern American history, could have been subtitled 'a small case of genocide.'

The term 'genocide' has entered the lexicon of most languages world-wide. We vaguely understand that this term denotes an adverse, perhaps catastrophic, effect on an entire people. But we seldom stop to consider the criteria for classifying such an effect as genocide. Is it the sheer bulk of numbers killed? Is it the proportion, the percent, of a population that died? Is it the means used in achieving this effect? Is it the question of intent? Can genocide occur unintentionally? Does suffering by survivors count? And how does one measure suffering?

Certainly, the numbers of Aleut evacuated from their homelands against their will in 1942 are insignificant when compared to the number of Jewish victims in Germany or to the number of Russian, Ukrainian, and Cossack people who died during the artificial famine of 1933. The numbers of Aleut dead in evacuation camps may be compared to the number of Nivkh men executed by the Soviet regime for alleged collaboration with the Japanese. But the Aleuts did not die from bullets; they died of malnutrition and illness. And, certainly, the deaths were not intended. Nevertheless, the proportion of the Aleut population that died, as Dean Kohlhoff demonstrates, was great. The majority of the dead were young children and infants, as well as the elders — the bearers of the Aleut tradition, the keepers of the ancient knowledge, values, and guides to the Aleut way of life. Aleuts themselves compare the effects of the evacuation (in terms of dislocation and cultural shock suffered by the survivors) to the worst excesses of the seventeenth century penetration of their habitat by Russian fur-procuring vessels.

How and why did this happen? And why, until recently, was this small 'injustice' and insult offered to a group of US citizens ignored not only by the general public, historians, and anthropologists, but, much more to the point, by the powers that be? Kohlhoff's book provides most, if not all, of the answers. His account, based on meticulous archival research, participants' accounts, and other primary sources, demonstrates how a combination of prejudice, bureaucratic incompetence, the desire to avoid blame (should anything happen to this segment of civilian population residing in a potential war zone), and the attitude that the most deprived conditions were good enough for these 'primitive' people, caused untold suffering for a whole people.

The author traces, in an unemotional, dry, sometimes even pedantic, tone, the debate about the necessity (or lack thereof) to evacuate the Aleuts. He describes the bickering between territorial and military authorities (the army arguing against evacuation, the navy for it), the eventual decision to proceed under the cover of the catch-all phrase 'military necessity,' and the ultimate involvement of no fewer than eight civilian agencies in the decision-making that resulted in a lack of preparation of facilities to hold the evacuees, supply the make-shift camps with food, or provide medical services. He shows the ambivalence of the status of the Aleuts. In some contexts, Aleuts were US citizens, and as such, many young men served in the armed forces, either as volunteers or draftees. In other contexts,

they were 'wards of the state' under the care and supervision of the Bureau of Indian Affairs. In yet another context, specifically in the case of the Pribilovians from the Seal Islands of St Paul and St George, they were treated not only as wards of the state, but as sealers, and were brought back from the evacuation camps (and from the military units where some served) to harvest the fur seals for the benefit of the US Treasury. Here, the Fish and Wildlife Service personnel were responsible (the reader is advised to consult the chart 'United States officials involved in Aleut evacuation' provided by the author on pages 188–189). Although the 'military necessity' argument was used, and the necessity to guarantee the safety of civilians was frequently invoked, only persons of '1/8 Aleut blood' or more were evacuated. Families were sundered and non-Aleut spouses were left behind, some never to be reunited again. Husbands and fathers of Euro-American origin could not even visit their evacuated families in the camps.

The camps were located in southeastern Alaska, scattered in a remote, heavily forested region, very different from the Aleutian Islands habitat. The housing was abandoned canneries and gold mines and, in one case, a former CCC camp. There were no cooking facilities, laundry or sanitary provisions, and food was scarce. The 'evacuees' were used to providing for their own subsistence, but they were unable to do so because they had no equipment: no boats, guns, fishing tackle, nets, etc. Sometimes they had less than 24 hours notice of a removal, and were not allowed to bring more than one bundle apiece. Treasured possessions were all left behind, as were sheep at the village of Makushin Unalaska (all died) and cattle and poultry at many other locations. Additionally, houses and churches had to be abandoned — the churches being the centers of the Aleut spiritual life, many containing untold treasures dating to the reigns of Alexander I and Nicholas I, or even earlier. Possessions, houses, and churches were, in the absence of owners, plundered and vandalized, and, in one case, the entire village of Atka was burned (although three dwellings with internal plumbing were saved by the navy and later used as officers' quarters).

Only one Aleut settlement suffered at the hand of the Japanese, well before the other villages were relocated. When Japanese forces occupied the island of Attu, the villagers were transported to Hokkaido, where almost half of them died of illness and malnutrition. When they were returned to the United States following the end of hostilities, they were not permitted to return home. A few chose to settle on Atka, among their traditional former enemies, others scattered to various cities.

Although the main thrust of the book is the story of the evacuation, Kohlhoff does not omit to discuss the case of the Attuans, nor does he forget the story of the evacuees' return: the joyous expectation on the part of the Aleuts when familiar landscapes were spied from aboard the vessels that were carrying them home, as well as the shock when they saw the ruins of their former homes. He also

shows the disappointment when the authorities declared that many small settlements were not viable and that the people would not be permitted to return there.

Kohlhoff details the efforts to rebuild their communities by their own means, and how, starting from scratch, the Aleuts succeeded in reconstructing their shattered lives. He also points out the positives: the awareness, especially on the part of members of the younger generation, of the wider world, of the opportunities for political action, of the possibility to fight for their rights. And fight they did. It took them many years, and many a sufferer departed this world without seeing the wrongs righted, but in the end the Aleuts won. The President of the United States, Ronald Reagan, publicly acknowledged the unjustified suffering inflicted upon this people by the United States, and Congress voted to recompense the survivors for their losses. The individual sums were small, but the community as a whole is being recompensed. This past summer, the entire Aleut community celebrated the reconstruction of the church of St Nicholas on Atka, burned at the order of a US Navy officer, and the construction of two chapels commemorating the other two churches destroyed during the war, those on Amchitka and Attu islands.

The book is heavy reading due to the complexities of the process that led to the evacuation, but Kohlhoff ably disentangles them. The book, however, is highly recommended as a first-rate study of an unintended, small-scale genocide-like event that can occur even in a democratic nation. Kohlhoff has my thanks for bringing this festering wound into the open and providing a lesson on the theme 'it can happen here, too.' (Lydia Black, Department of Anthropology, University of Alaska Fairbanks, Fairbanks, AK 99775-7720, USA.)

**ALASKA.** Marvin Falk (Compiler). 1995. Oxford, Santa Barbara, and Denver: Clio Press (World Bibliographical Series volume 183). xxxi + 219 p, illustrated, hard cover. ISBN 1-85109-141-6. £38.50.

**THE FALKLAND ISLANDS, SOUTH GEORGIA AND THE SOUTH SANDWICH ISLANDS.** Alan Day (Compiler). 1996. Oxford, Santa Barbara, and Toronto: Clio Press (World Bibliographical Series volume 184). xvii + 231 p, illustrated, hard cover. ISBN 1-85109-236-6. £40.50.

Given that for more than 30 years bibliographic databases have offered the capacity to generate bibliographies on any subject with a few key strokes, do we still need bibliographies that meet the OED's classic definition of bibliography as 'the systematic description and history of books, their authorship, printing, publication, editions...'? Given indeed that it is now within the abilities of the neophyte doctoral candidate to generate a near-comprehensive list of publications on the precise subject that he or she is proposing to study, what is the need for less than comprehensive bibliographies on only broadly related topics? As the co-compiler of a related volume to those under discussion here, these are questions that I have certainly had to ask myself.

The World Bibliographical Series is the standard series of bibliographical monographs to be organized by geographical region, and with these two volumes its coverage of the polar regions may be said to be complete; the other relevant titles are *The Antarctic* (no. 171, 1994), *The Arctic* (no. 99, 1989), *Canada* (no. 62, 1990), *Finland* (no. 31, 1981), *Greenland* (no. 125, 1991), *Iceland* (no. 37, 1983), *Norway* (no. 67, 1986), *Russia/USSR* (no. 7, 1994), *Siberia and the far east* (no. 127, 1991), and *Sweden* (no. 80, 1987). These unquestionably are 'bibliographies' in the OED's sense, although in addition to books, periodicals, articles, reports, and other forms of literature are included, particularly on subjects for which no books exist. Each volume consists of annotated entries to primarily English-language publications grouped under standard headings. The bibliographies are selective, and their quality relies necessarily on the subjective judgement and knowledge of the individual compilers, both as to choice of material and informativeness of annotations. For the two volumes under consideration, more qualified compilers could hardly be found. Marvin Falk is curator of rare books in the Alaska and Polar Regions Section of the University of Alaska Fairbanks. He is also the compiler of the standard historical cartobibliography of Alaska. In addition to compiling the acclaimed volume on England in this series, Alan Day has previously demonstrated his polar expertise in a comprehensive bibliography of the Northwest Passage. Since he is also co-editor of the 'Librarian's Bible,' *Walford's guide to reference books*, Day's bibliographic expertise may be regarded as without peer.

Whilst several volumes have been devoted to regions (for example, the Arctic and Antarctic), and one (Siberia and the far east) to a region within one country, Falk's is only the third to be devoted to a single American state. As with Texas and Hawaii, the other two states to have received such treatment, Alaska's distinctive geography and history has been reflected in a well-established bibliographic tradition — from Wickersham (1927) on — in which it has received separate treatment from 'the lower 48.' Falk is fortunate to be able to build on this tradition. As a thumbnail sketch, Falk's introduction briefly summarizes all that is most distinctive about his state. In it one learns, for example, that Alaska has five distinct climate zones (temperate oceanic, subtemperate, maritime Arctic, interior continental, and high Arctic or polar), the third greatest concentration of glaciation in the world (following the Antarctic and Greenland), and that, so far from teeming with fish and wildlife, it has a total wild biomass less than half that of Texas. This introduction packs a great deal of information into just 19 pages and may be recommended to anyone desiring a brief but highly informative account of the state. With regard to selection of the 793 items, it is as ever possible to identify significant omissions, the most glaring to this reviewer being Plafker and Berg's *The geology of Alaska* (1994). This is the standard source for its subject and would have strengthened a rather weak geological section. In general, the scientific sections appear weaker than those for the humanities, particularly