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## Gift of Books to Institute Library

In October 1967, the Arctic Institute library received from Mrs. Kenneth Collins of Almonte, Ontario, a gift of some 250 books dealing with the polar regions. These vol-

umes, which were collected over the years by Mrs. Collins' husband, include many very well-known works, some in particularly handsome bindings; among them, for example, is a copy, in fine condition, of Phipps's *A Voyage Towards the North Pole*, London, 1774. A plate from this book has been used as a frontispiece for the present issue of *Arctic*.

The books will augment the library's working collection; any that prove to be duplicates will be sent to the Arctic Institute's research stations at Kluane Lake in the Yukon, and Cape Sparbo on Devon Island, where such additions to their small collections will be much appreciated by the staff.

The Arctic Institute library is very grateful to Mrs. Kenneth Collins for her kind and generous gift.

## Reviews

**ABLATION AND RUN-OFF ON THE WHITE GLACIER, AXEL HEIBERG ISLAND, CANADIAN ARCTIC ARCHIPELAGO.** BY W. PETER ADAMS. *Axel Heiberg Island Research Reports: Glaciology, No. 1, 1966. 8½ x 11 inches, 77 pages. \$2.50.*

We have come to expect a very high standard in content and presentation in this report series, prepared under the direction of Professor Fritz Müller, the scientific leader of the Jacobsen-McGill Arctic Research Expedition. The present report maintains this high standard, and is another result of a comprehensive study of the evolution of the mountainous and strongly glaciated area of west-central Axel Heiberg Island.

One of the main findings of this report is that daily melt on a glacier can be more accurately assessed by the sodium dichromate dilution method than by the conventional method of measuring surface lowering at stakes. In the lowest 4 km. of the White Glacier, the area of main importance in the study, stakes were set in 1 longitudinal and 5 transverse profiles to give a coverage of about 23 stakes/km.<sup>2</sup> These formed the network for the surface-lowering measurements, the difficulties of which due to differential melting and formation of cryoconite holes are described. The Star Ablatometer and the Lister Ablatograph were devices used with

some success to obtain representative measurements of surface lowering. Over a 12-day period in late July and early August, the Star Ablatometer provided an ablation value closer to the theoretical one than that derived from measurement of the discharge. But the dilution method of measuring discharge, at present experimental, should eventually prove more convenient. It was used to obtain an accurate rating curve for a stable sector of a lateral stream, although unfortunately it was impossible to construct a dam strong enough to withstand periods of exceptional flow. On the other hand, discharge was measured quite successfully in supraglacial streams by this method. The measurements should begin before and end after the ablation measurements, so that periods of ablation and periods of run-off can be correlated. Surface ice density on the glacier varies, often daily, and this increases the difficulty of assessing ablation. Cryoconite holes are another complicating factor; they are caused by absorption of short-wave radiation by a layer of dust (in which pebbles may occur) or by the heat of metabolism and photosynthesis of organisms, or by a combination of both, and are aptly described by the author as "the extreme symptom of the dominance of radiation melting on Arctic glaciers."

The large scale ablation studies on the White Glacier from 1959 to 1961 are described in detail with an analysis of the

meteorological factors involved. From these studies emerges the striking effect of the incidence and amount of snowfall on ablation. Snowfall is shown as an important factor inhibiting ablation to give marked differences between budget years. Another result is the demonstration of the high contribution of the snout section of the glacier to ablation and run-off totals; the great increase in ablation on the steep outfacing slopes of the glacier is very apparent. The roles of slush avalanche and superimposed ice are discussed. The former makes possible the transfer of mass, without net loss to the glacier, across the regional equilibrium line, and the latter complicates the assessment of net ablation and run-off. The author also deals with the accumulation and ablation on the Baby Glacier, concluding that this glacier is out of equilibrium with the present climate, and is wasting rapidly. The net loss in the 3 years 1959 to 1962 was considerable, and a well-marked trim line shows that this is no short-term effect. In a detailed consideration of the discharge from the White Glacier catchment, an important conclusion is that rainfall has a disproportionately great effect on the run-off.

This report, which is very well produced and illustrated, makes a valuable contribution to the measurement of run-off, and to the problems of relating run-off to ablation and of comparing net ablation with total discharge. The author is to be congratulated on his experimental methods in the field, for they show great promise for future work.

*G. Hattersley-Smith*

**THE ADMIRALTY CHART: BRITISH NAVAL HYDROGRAPHY IN THE NINETEENTH CENTURY.** BY REAR ADMIRAL G. S. RITCHIE, DSC, HYDROGRAPHER OF THE NAVY. London: Hollis & Carter Ltd., 1967. 6 x 8¾ inches, 388 pages, including 12 maps and 10 plates. £4-4-0.

Rear Admiral Ritchie needs no recommendation when it comes to personal knowledge of his subject. I approached the review of this book with some trepidation as I know from long experience what a tedious job actual hydrographic operations are, and I could see little or no relationship to arctic waters. Charts of any value regarding the Canadian Arctic coast did not exist until 1955-56, and even these are very spotty to date.

However, what was expected as dull reading turned out to be a fascinating story and for the first time I realized that almost all,

if not all, of those hardy explorers of the British Navy entering the Polar Seas belonged to the Hydrographic Service of Their Majesties. There has always been the question in my mind of how the Navy commanders of the nineteenth century, with only sail, conned their ships through the arctic ice floes to almost every point that major ice-breakers have covered. The Admiralty Chart explains this fact by showing the calibre and training of the navigators involved. Such names as Ross, Parry, Franklin, Crozier, McClintock, McClure, Collinson, Kellet, Austin, Beechey, Meham, and Nares, as well as others, make up the roll call of those men who were primarily first-rate hydrographers and then entered arctic waters as explorers.

Rear Admiral Sir William E. Parry, one of the greatest arctic navigators, became Hydrographer of the Navy, as did Captain Sir Frederick J. O. Evans and Vice Admiral Sir George W. Richards, also of polar experience. Three out of the eight Hydrographers are of that era.

Reading *Admiralty Chart* leads one through most of the shallow waters of the world to the dangerous reefs and shoals, and finally, to the safe channels. But, first of all, it reveals the British spirit at its best and the tenacity of efficient charting; the rescue of ships; the pursuit of war and the old axiom that "in war, everything is possible; in peace, make do." It also reveals Fitzroy buying a ship on his own recognizance to carry out required hydrographic duties, and the Lords Admiralty ordering him to pay for it out of his own pocket.

You live the tedious but exciting existence of hardship and privation that were always attendant to these voyages, voyages that lasted for years, not months, and you see the forming of characters of these hydrographers who made hydrography a science rather than "by guess and by God." For instance, Admiral Belcher becomes wholly understandable when one knows his background and attitude. Commander, later Sir, George H. Richards, kept a diary on Belcher while with him in the Arctic. It is explicit: "If any person ever makes public the writings in this diary may he be haunted by my ghost in this world and the next!"

The Admiralty Chart should be required reading for any student of hydrography, and certainly it is a *must* for anyone who would study the impact of the British Navy in the exploration of the Arctic or who desires to become a knowledgeable arctic buff.

*S. E. Alexander*