

INTRODUCTION

by

Professor Hans Röthlisberger

(President, International Glaciological Society)

Your Excellency, President of Iceland, Madam Vigdís Finnbogadóttir, Rector of the University of Iceland, Dr Gudmundur Magnússon, Ladies and Gentlemen:

As the President of the International Glaciological Society I welcome you all to the Symposium on Glacier Mapping and Surveying. It is the first time in the history of our Society that we have had the Head of State with us for the opening ceremony of a Symposium, and we feel duly honoured.

First of all I want to thank the local organizers, namely Helgi Björnsson, Elias Eliasson and Haukur Tómasson, for their great efforts to make us feel comfortable. Various institutions in Iceland have contributed, and are still contributing, to set the proper frame for a successful conference. Very important financial help was obtained from the Nordic Cultural Fund, for which we are very grateful.

Our Symposium is indeed partly a Nordic event, emphasized not only by the origin of many of the participants and by the titles of the papers to be presented, but also by the exhibition of glacier maps, ancient documents, and photographs of the activity of the local glaciologists, appropriately on display in the Nordic House. I can warmly recommend a visit to this impressive exhibition to all those who have not yet seen it.

Before mentioning the scientific objectives of this symposium, I should like to introduce ourselves in a few words to our hosts. The International Glaciological Society, originally known under the name of The British Glaciological Society, will next year celebrate its 50th anniversary. The members come from many different countries all around the world and represent many different fields concerned with snow or ice in almost any form. Members are mainly professionals and some interested laymen. Presently there are well over 700 members. Usually some join the Society on the occasions of symposia, and I hope that this will work now, so that there will soon be a few additional members. Traditionally, glaciologists tend to be strong-minded individualists (at least those working in the field). I mention this as an explanation, if not an excuse, to those who had to cope with unregistered late arrivals. Many glaciologists come from mountainous countries, or islands, which may explain part of the individualism! Nevertheless, glaciologists develop strong links across the borders and oceans. For many years, the IGS has been instrumental in forging these links, so that the IGS and the glaciological community are almost synonymous.

The topic of our Symposium – Glacier Mapping and Surveying – is reasonably self-explanatory. A similar Symposium on Glacier Mapping was held 20 years ago in Ottawa, from 20–22 September, 1965, under the joint sponsorship of the International Commission of Snow and Ice (ICSI) and the National Research Council of Canada. A few of the participants here have also attended the Ottawa meeting.

When comparing the two Symposia, one becomes immediately aware that the emphasis has greatly shifted. In 1965, the majority of papers dealt with classical photogrammetric surveys and the products thereof. Part of the mapping activities and needs were seen as an integral

part of the International Hydrological Decade, like the small-scale maps for the distribution of glaciers, or the large-scale maps of representative hydrological basins. Recommendations were made to attempt standardizations, to improve international exchange, and to promote new techniques. Some of the recommendations have materialized, others have not. The map collection on display outside the lecture room is no doubt to a high degree the result of this former meeting.

Gordon Robin was one of the proponents of the development of new techniques. I shall cite from the abstract of his paper printed in the Canadian Journal of Earth Sciences:

"It is proposed that a radio altimeter be installed in a satellite to measure its height above the surface. It should work at a frequency of the order of 10^4 Mc/s and measure heights to an accuracy as close as practicable to ± 5 m. Heights above the ocean would be extrapolated to calculate satellite heights above sea level while over the Antarctic continent, and the difference between this calculated height and the measured height would give the surface elevation. Geometrical sounding errors and systematic errors may cause errors up to 50 m on relatively flat ice sheets, but incremental errors over 10 km should be of the order of 10 m."

You will notice at this Conference that even higher accuracies of about 2 m have actually been achieved.

Looking at the papers submitted to this Symposium, one becomes immediately aware that glacier mapping has become a much more diversified field than was the case 20 years ago. Photogrammetric surveys are still useful, and specific applications and improvements – in particular for the determination of volume changes – will be reported on; but a large percentage of the papers that will be presented now deal with satellite techniques. Other methods have also opened up new horizons. Radio echo-sounding techniques are now so well developed that glacier beds can be mapped quite routinely along with the glacier surface. All the methodical improvements and innovations of course enlarge the variety of possible applications. Those include the classical use of maps and survey techniques for glacier inventories, monitoring glacier variations and mass-balance studies – extended to the continental ice sheets – or the studies of ice flow, iceberg calving rates, internal structure of ice masses and bottom layers.

Not all of this work, but certainly some of it, is of practical importance, because (an explanation hardly needs to be given to Icelanders) glaciers represent water resources as well as danger to mankind.

We are looking forward to an interesting week, and I hope that you will all enjoy it!

I now have great pleasure in introducing a welcoming address by the Rector of the University of Iceland, Dr Gudmundur Magnússon.

REFERENCE

Robin G de Q 1966 Mapping the Antarctic ice sheet by satellite altimetry. *Canadian Journal of Earth Sciences* (special issue containing papers presented at a Symposium on Glacier Mapping, Ottawa 1965) 3(6): 893–901