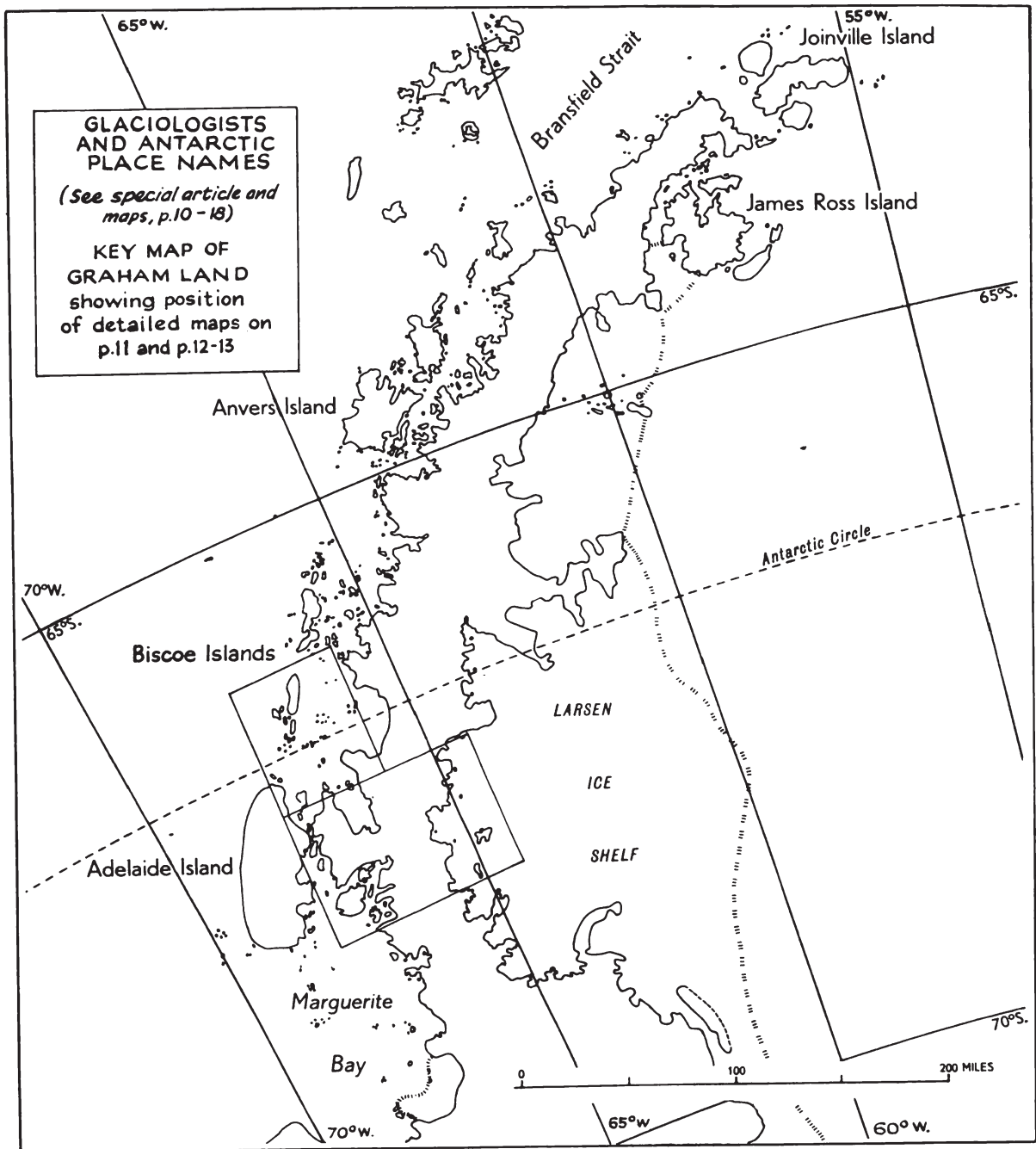


NUMBER 9

JANUARY 1962

# ICE



# ICE

## News Bulletin of The British Glaciological Society

Number 9

January 1962

"JOURNAL OF GLACIOLOGY". We have pleasure in announcing that in 1962 the Journal will be published three times instead of twice, and that as from 1963 we hope to be able to publish it four times a year. The Committee of the Society hopes that members' subscriptions can be kept at £2 (\$6.00) a year in spite of this increase in the number of pages published and in spite of continually rising printing costs.

SUBSCRIPTIONS FOR 1962. Members are reminded that subscriptions are now due. Please send your £2 or \$6.00 without delay to the Society, c/o Scott Polar Research Institute, Lensfield Road, Cambridge, England. Thank you. A form is enclosed for your convenience.

NEW CONSTITUTION. We are grateful to the members who have sent comments on the draft new constitution which was circulated in November. The Committee has discussed the comments, many of which will appear in the final version. At the Extraordinary General Meeting on 6 January the new Constitution will be submitted for members' approval.

HONORARY MEMBER. The Committee of the Society has unanimously elected Dr. Hans W:son Ahlmann an Honorary Member, in recognition of his great services to glaciology. We are especially pleased that Dr. Ahlmann plans to attend the Twenty-fifth Birthday Celebrations in January 1962.

ASSOCIATION FOR THE STUDY OF SNOW AND ICE. This Association was the fore-runner of the British Glaciological Society, and several issues of its small journal entitled "Papers and Discussions" are missing from the Society's library.

If any member could spare copies of any or all of these issues would he please send them to Mr. Seligman, Little Dane, Biddenden, Ashford, Kent.

We have learned with great sorrow of the death in a 'plane crash near Wilkes Station, Antarctica, of Dr. Ed. Thiel. Dr. Thiel had made valuable contributions to the knowledge of West Antarctica during the traverses from Byrd and Ellsworth Stations during the I. G. Y. He had returned to Antarctica this season to make a geophysical study of the deep sea trench beneath the western margins of the Ross Ice Shelf. We offer our sincere sympathies to his wife and to all his colleagues. A full obituary will be published in the "Journal of Glaciology" in the summer.

### Field Work

CANADA - REPORT OF THE SUB-COMMITTEE ON GLACIOLOGY OF THE ASSOCIATE COMMITTEE ON GEODESY AND GEOPHYSICS, NATIONAL RESEARCH COUNCIL. Glaciological research in Canada in 1961 was reported at a meeting in November in Ottawa. The full account may be read in "Canadian Geophysical Bulletin", Vol. 14, 1961. Some of the projects are briefly summarised below. The areas covered in the full report are: Athabasca Glacier and Columbia Icefield, Alberta; Selkirk Mountains, Rocky Mountains and Northern Coast Mountains, British Columbia; Ogilvie Mountains, Yukon Territory; Icefield Ranges, Yukon Territory; Baffin Island - Barnes Icecap, Eklagud Fiord, Penny Icecap, Cumberland Peninsula; Devon Island; Axel Heiberg Island; N. W. Queen Elizabeth Islands - Meighen Island, Melville Island, floating ice islands; Ellesmere Island. In addition the report summarises the mapping of glacierized areas, photogrammetric studies, laboratory studies, and the inventory of Canadian glaciers.

**ICEFIELD RANGES YUKON TERRITORY.** This project has been organized by Walter A. Wood and is sponsored by the American Geographical Society and the Arctic Institute of North America. In this first field season an upper field station at 2600m. was occupied from June to August, with R. H. Ragle in charge of the glaciological programme. Pit studies to a depth of 4.5m. and coring to 15m. revealed 4 annual layers of accumulation, with a mean water equivalent of 155m. Snow and firn temperatures were taken down to 15m; during the summer the snow became isothermal to a depth of 2.5m. On a 24km. traverse across the ice divide, snow accumulation markers were set at a depth of 3m. and seated on plywood plates. These markers stand 5m. above the surface. Barometric alimetry traverses were carried out across the divide and on selected courses in the accumulation area. The firn line lies at an elevation of 2200m. on the east side of the divide and at 1100m. on the west side. Standard meteorological observations were made. Dr. Wood, who was in charge of the survey programme, established a series of trigonometric quadrilaterals from a measured base near the upper station. The network comprised 9 survey stations, from which all glaciological stations were intersected, as well as 14 points whose distribution on existing aerial photographs will permit stereo-photogrammetric orientation and plotting.

**BARNES ICECAP, BAFFIN ISLAND.** J. D. Ives (Geographical Branch, Department of Mines and Technical Surveys) was in charge of a reconnaissance party working near the N. W. margin of the icecap. A series of cairns was built along the margins of the icecap and of a small outlet glacier as reference stations for photography. Stakes drilled into the middle section of the glacier were surveyed, and will be resurveyed in 1962 to measure surface flow. Run-off conditions were studied with particular reference to the relationship of the main lateral melt streams of the outlet glacier to a series of glacial drainage channels now abandoned on the upper hillsides. Snow bank, geomorphological and lichen studies between the icecap and the Rowley River led to the conclusion that seven-tenths of this currently ice-free area had been covered with permanent snow and ice within the last several hundred years. Studies were made of the very recent extent of former ice-dammed lakes and of the Barnes Icecap perimeter. Detailed studies are planned over the next few seasons, some in co-operation with the Gravity Division of the Dominion Observatory which is also responsible for work on the Penny Icecap.

**NORTH-WESTERN QUEEN ELIZABETH ISLANDS.** Glaciological studies form part of the programme of the Polar Continental Shelf Project, under E. F. Roots' direction.

On Meighen Island, K. C. Arnold (Geographical Branch, Department of Mines and Technical Surveys) was in charge of the station at the summit of the icecap, 240m., from June to August. Snow depth and density measurements in pits showed a mean accumulation of 20cm. water equivalent from 1 September 1960 to 1 June 1961; net ablation over the whole icecap in 1960 was 70cm. of ice on the summit and 175cm. near the south end. In 1961 accumulation was 3cm. of superimposed ice on the summit and at a few other stakes; mean ablation was 26cm. on the northern traverse of the icecap and 18cm. near the south end. Coring near the station provided a stepped profile down to 52m; cores were shipped back to Ottawa for further study. Movement studies were made, using the stake network established in previous years; movement appeared to be well related to the thickness of the ice. At the margin of the icecap measurements were made of the recession of the ice which were correlated with deduced rates of thinning.

Floating ice islands: Dr. Roots reported that the ice island T1 had been stationary off Loughheed Island since the summer of 1960. He also reported that the ice island on which the Americans established their station ARLIS II in March 1961 was probably used by the Polar Continental Shelf Project for a survey station in April 1959, when it lay 25 km. N. W. of Cape Isachsen, Ellef Ringes Island. Its position in October 1961 was 800 km. N. W. of Point Barrow. An examination of the abundant rock material suggested that the island may have originated from the east side of Phillips Inlet on the north coast of Ellesmere Island.

**GLACIOLOGICAL WORK ON AXEL HEIBERG ISLAND, N. W. T., IN 1961: JACOBSEN-McGILL ARCTIC RESEARCH EXPEDITION.** (Special report from Fritz Müller).

During the summer of 1961, the second year of the expedition's major operation, a team of twenty people was in the field for four months. The National Research Council, Ottawa, gave generous support by allocating funds to the expedition through four Departments of McGill University - Geography, Geological Sciences, Meteorology and Physics. The Geological Survey of Canada, the Polar Continental Shelf Project, the Topographical Survey, the Dominion Observatory (all branches of the Department of Mines and Technical Surveys) and the Meteorological Branch of the Department of Transport directly assisted the work of the expedition. In addition financial help was received from the Arctic Institute of North America (the Office of Naval Research) and from the Department of Geophysics of the

University of Toronto. Work on the island commenced on 12 May and ceased on 29 August. Fourteen members spent a total of 1500 man-days doing glaciological fieldwork under the leadership of F. Müller. Senior scientists participating were Max Diem (glacial meteorology), Hans Boesch and Sten Rudberg (geomorphology) and Peter Fricker (geology).

The party reached Eureka Weather Station and returned from there to Montreal by a chartered DC4 of Nordair Limited. The airlift to the Base Camp at the head of Expedition Fiord in the central part of western Axel Heiberg Island was carried out by a commercial "Beaver" aircraft. Transportation on the island was most successfully performed by a Piper Super-Cub piloted, as last year, by Terence M. Hendrigan. Some 400 landings were made on unprepared ground, more than half of them on snow and ice.

Glaciology, including hydro-glaciology: Working on the same glaciers as during the previous summers (the White, Thompson, Baby and Crusoe Glaciers and the McGill Ice Cap\*), measurements were continued to establish the mass budgets. The 250 stakes from the previous summers were periodically checked for measurement of accumulation, ablation and surface velocity and - where necessary - redrilled to last through to the summer of 1962. In addition a total of 48 new stakes was inserted. The zone of equilibrium in the area was found to be at an altitude of approximately 900 m., which would be about 100 m. lower than in the 1960 season. The previous winter's snow cover and, later on in the season, the 1961 summer accumulation, were investigated in some 75 pits. A shaft of 27.2 m. depth was dug near Upper Ice Station II at an elevation of 1920 m. on the highest part of the McGill Ice Cap\*. The lowest accumulation layer in this pit represented the year 1920, the mean water value per annum being 37.1 cm. From the bottom of the shaft firn cores were extracted to a depth of 10 m. using a 3" SIPRE drill. As a control of the field analysis of the firn profile in the shaft a drilling was made alongside to a depth of 21 m. So a total of 31 m. of firn cores was sent out for further investigation in the laboratory. From the walls of the ice shaft 76 samples of firn, amounting to 450 kg., were collected and transported south to study their non-radioactive constituents, long-lived fission products, natural radio-activity, alpha-emitter and  $Rh^{102}$  features.

In continuation of a study of the temperature regime of the glaciers in the area an additional 35 thermistors and 12 platinum elements were frozen into drill holes in the accumulation and ablation areas. The temperature profile on the tongue of the White Glacier was extended to a depth of 30.5 m. The ice cores from this hole were sent in the freezing compartment of the ice-breaker "John McDonald" to McGill University for crystallographic analysis. Polaroid photographs of 75 thin sections from this ice column had already been prepared in the field.

Beneath the lowest ice fall at the right margin of the White Glacier a detailed investigation of the ice movement was made surveying the velocity field of the ice surface from five base lines ashore of the glacier. An attempt was made, using deflectometers, to measure directly the vertical velocity distribution.

W. Peter Adams continued his special study of the rate and modus of ablation on the tongue of White Glacier started in 1960. The chromate dilution method of measuring the related run-off proved to be most practicable and to yield very accurate results.

Geophysics: The geophysical operations were carried out by George May. Two longitudinal profiles were shot to determine in more detail the thickness of the White and Thompson Glaciers at their tongues, using a 2-channel FS1 seismograph. With an echo-depth sounder profiles were made of the glacier-dammed Phantom Lake\*, of Expedition Fiord and of Iceberg Bay\*.

Glacial meteorology: Two main stations were operated from 20 May to 26 August. The Lower Ice Station was established on the same site as in 1960 on the tongue of the White Glacier. On the ice cap the Upper Ice Station was moved some 25 miles to the NE and approximately 230 m. higher than in the previous year. With the exception of a few readings during some heavy rain and snow storms at Upper Ice Station II, a complete set of radiation and synoptic records was collected. Particularly good results were obtained with the Kipp and Zonen and the Twin Davos model solarimeters. Two subsidiary weather stations were established on bare land for comparative purposes, one near the Base Camp on Colour Lake\*, the other on the northeast side of Meighen Island only a few meters above sea-level. The readings at this latter station were taken by personnel of the Polar Continental Shelf Project.

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\* Names with an asterisk have been submitted for approval to the Canadian Board on Geographical Names.

Glacial geomorphology: A special survey of glacier-dammed lakes and the mechanism of their level fluctuations was made by Hans Maaq. A thorough analysis of structures and material in the periglacial area led to distinguishing two glacial periods for this part of the Arctic.

UNIVERSITY OF LONDON BEERENBERG EXPEDITION TO JAN MAYEN ISLAND. (A contribution from the members of the 1961 Beerenberg Expedition - written on behalf of Peter Smith, who so tragically lost his life on this expedition.)

As originally planned, the 1961 Beerenberg Expedition had an extensive geological, glaciological and mountaineering programme involving two months' work for between ten and fifteen men on the 7,500' volcanic mountain that dominates North Jan Mayen. The expedition was mounted at Birkbeck and Imperial Colleges of the University of London. A ten-man advance party, F.J. Fitch (leader and scientific director, Birkbeck College), P. Smith (deputy leader and glaciological team director, Imperial College), T.R.W. Hawkins (geologist, H.M. Geological Survey), D. Thomas (climber, H.M. Geological Survey), B. Roberts (geologist, Birkbeck College), C.M. Smith (glaciologist, Imperial College), J.D. Booth (glaciologist, Imperial College), J.R. Fraser (glaciologist, Imperial College), J.F. Cole (photographer, G.P.O. Research Station) and P.J.D. Guile (technician, Imperial College), sailed from Inverness on 10 June 1961 in a chartered Norwegian sealer, the 133-ton "Signalhorn" of Aalesund.

The geological party was landed at Cross Bay on 15 June, and the glaciologists (P. Smith, M. Smith, Booth and Fraser) were established at Jameson Bay by the 16th. The first part of the glaciological programme was an enlargement and continuation of the work done on Sörbreen b; a party led by Peter Smith in 1959. Between 17 and 24 June, full lines of stakes were established across the glacier at 100-, 300- and 900-metres, a complete re-survey was made of the snout position and form, and a series of holes was drilled for the insertion of thermistors. Fitch and Cole came from Cross Bay to North Lagoon in the expedition's motor boat on the 25 June, in order to bring the glaciologists north for a combined attack on the ice-filled crater of the Beerenberg. On the return journey a sudden violent mountain storm capsized the boat near Vakta. All six were wearing life-jackets, but the water was extremely cold, and although the beach was less than 100 yards away, Fitch was the only survivor of this tragic accident. Fitch was taken off Jan Mayen for medical treatment by the Norwegian frigate "Garm", which carried out a search for survivors. The body of Martin Smith was recovered at sea.

A reduced geological survey team carried on mapping and making general glacier surveys until relieved by a second party in "Signalhorn" on 14 July. The second party, J. Banfield (deputy leader and geologist, Birkbeck College), Miss B. B. Fox (geologist, H.M. Colonial Geological Surveys), A.W. Wells (geologist, Birkbeck College), J.D. Slade (geologist, Birkbeck College), Miss R.J. Conran (geologist and biologist, Birkbeck College) and C.J. Talbot (geologist, Imperial College) continued the detailed geological survey and made general glaciological observations from base camps at West Bay and Jameson Bay during the period 15 July to 15 August. The body of J.F. Cole was recovered by this party and buried by the Expedition Base Camp at Cross Bay.

Fitch and Thomas returned to Jan Mayen in "Signalhorn" on the 7 August, accompanied by D. J. J. Kinsman (glaciologist, Imperial College), J. W. Sheard (glaciologist, Imperial College) and D. C. Birch (climber). In the following fortnight a vigorous attempt was made to complete the work begun by the glaciologists lost in the tragedy. This was not easy, as all but one of their field notebooks and all of their log books and maps had been lost. In this respect the expedition was fortunate in being able to obtain the help of D. J. J. Kinsman, who had been a member of the Sörbreen team with Peter Smith in 1959. Kinsman and Sheard, with help from other members of the expedition, re-surveyed the snout area of Sörbreen, made surface flow and ablation measurements at the three lines of stakes previously established, made surface temperature observations and carried out a general photographic survey of the glacier. The re-advance of Sörbreen recorded in 1959 has continued, and the suggestion then made, that this was part of a general ice advance of the Beerenberg ice-field, has been amply confirmed. Photographic records were made, therefore, of the snout positions and state of all the other glaciers of North Jan, and of the rime domes of the summit crater rim of the Beerenberg. The mountain was successfully climbed by Birch and Kinsman on 14 August. Before leaving the island a memorial plaque to the five men lost in the accident was erected at Cross Bay behind the grave of J. F. Cole. The expedition arrived back at Inverness in "Signalhorn" on 20 August 1961.

**BRATHAY EXPLORATION GROUP.** In August this year the Brathay Exploration Group continued its long-term study of the Tunsberdalsbre in Jostedal, Norway. The study was begun in 1956 with the main object of measuring the longitudinal strain rate from head to snout, and the Group has sent one or more parties to the glacier in each subsequent year.

The separation of stones previously placed 1,000 ft. apart along a longitudinal axis between the firn line and snout has now been remeasured for the fourth successive year. This has enabled the mean strain rate down the glacier to be deduced with some confidence. The longitudinal height profile through the same stones, begun in previous years, has now been completed. Across the glacier in three places height and velocity profiles were measured this year. The latter were made over a period of approximately two weeks and give values which, in the main, agree well with measurements made from year to year on several stakes placed periodically along the medial line of stones referred to above. We had hoped to refix the positions of 14 ft. aluminium tripods placed above the firn line last year so that velocity and strain rate data might be extended into the upper region. However, bad weather unfortunately prevented our getting at these again, although previous experience with them gives us hope that they may be just visible next year.

In the middle glacier (about 3,500 ft.) the ablation was found to have been about 6 ft. of ice this year, compared with 15 ft. from August 1959 to August 1960. At about 4,000 ft. an accumulation of about 4 ft. of snow was found where there was ablation of nearly 10 ft. last year.

The Group is particularly grateful for the help and encouragement in this work given by Dr. J. F. Nye of Bristol.

(Report from R. S. Maddever)

**AUSTRALIA.** U. Radok reports that there are two glaciologists with the Australian National Antarctic Research Expedition this year, continuing the work on ice temperatures and snow drift. A snow drift project is also being carried out for the U. S. Weather Bureau at Byrd Station. At Wilkes and Mawson petrofabrics analyses will be made during the year. In Australia the work on snow quality has been resumed with the capacitance method developed by W. Ambach in Innsbruck; from information supplied by him a transistorized version of his instrument has been built and has been tested in the Australian Alps.

## Meetings

**SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH.** The fifth meeting of SCAR was held in Wellington, New Zealand, 9 - 14 October 1961. A full report of the proceedings appears in the SCAR Bulletin, No. 10, published in the "Polar Record", Vol. 11, No. 70, January 1962. The Working Group on Glaciology made the following recommendations:

v. Gl. 1 - That glaciologists should select areas and traverse routes on which studies can be made over a long period of time.

v. Gl. 2 - That attention should be drawn to the use of radio waves for determination of ice thickness and that National Committees should be urged to study the possibility of developing this technique for use in the Antarctic. The need is emphasised for rapid dissemination of the results of field experiments.

v. Gl. 3 - That attention should be drawn to the need for systematic investigations of isotope dating methods, which should be made in consultation with specialists. In particular, the attention of the Joint Commission on Applied Radioactivity of ICSU should be drawn to this subject.

v. Gl. 4 - That because of the subjective judgement involved in seismic reflection shooting, publication or wide distribution of seismic shooting records from the high Antarctic plateau is now necessary. The Group suggests that one record per 100 km. of traverse be published.

v. Gl. 5 - That in view of the above recommendations a Permanent Working Group on Glaciology should be established within SCAR. The group should ensure adequate liaison with the Commission of Snow and Ice of the IUGG and see that the appropriate machinery exists for the full exchange of publications and data. M. C. Lorius was appointed Secretary for one year.

v. Gl. 6 - That the Working Group on Glaciology should study ways in which certain glaciological investigations in Antarctica can be standardized.

v. Gl. 7 - That the Working Group on Glaciology should draw up a list of laboratories interested in radio-active isotope studies in order to encourage close co-operation between field glaciologists and these laboratories.

v. Gl. 8 - That the opportunity be taken of holding a meeting of the proposed Working Group on Glaciology at the time of the Symposium of the Commission of Snow and Ice of the IUGG at Obergurgl in September 1962.

BRITISH GLACIOLOGICAL SOCIETY - twenty-fifth anniversary celebrations. As already announced the Society celebrates the 25th anniversary of its founding with a week-end meeting in Cambridge, 5 - 7 January 1962.

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|---------------------------------|---|
| Friday 5 January at 8.30 p.m.   | - Reception in the Scott Polar Research Institute, by kind permission of the Director, Dr. G. de Q. Robin.                              |
| Saturday 6 January at 9.30 a.m. | - Extraordinary General Meeting, in the Geography Department, by kind permission of the Professor of Geography, Professor J. A. Steers. |
| 10 a.m.                         | - Symposium on "The problems of mass balance studies". Chairman: Dr. G. de Q. Robin.  |
| - 12.30 p.m.                    | - Also in the Geography Department.   |
| 2.30 p.m.                       | - Symposium, continued.   |
| - 5.30 p.m.                     |   |
| 7.30 p.m.                       | - Banquet in St. John's College, by kind permission of the Master and Fellows.  |
| Sunday 7 January 2.30 p.m.      | - Symposium, continued.   |
| - 5.30 p.m.                     |   |

The proceedings of the Symposium will be reported in the "Journal of Glaciology". At the time of going to press the following speakers have accepted the Committee's invitation to present papers:

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|------------------|--|
| C. R. Bentley    | - Surface slopes and ice thickness in West Antarctica.   |
| H. Hoinkes       | - Mass balance studies on the Hintereisferner, Oetzal Alps, 1952-61.                                 |
| J. T. Hollin     | - Some problems of the Antarctic mass budget.  |
| E. R. LaChapelle | - Assessing glacier mass budgets by aerial photography.  |
| H. Lister        | - Mass balance of Ellesmere Ice Sheet.   |
| M. F. Meier      | - Proposed definitions for glacier mass budget terms.  |
| F. Müller        | - Problems of mass balance studies on Axel Heiberg Island.   |
| F. Nusser        | - Hydrographical investigations into the problem of the mass balance of the Kangerdlugssuaq Glacier. |
| J. F. Nye        | - Some implications of mass balance studies.   |
| V. Schytt        | - Regime investigations in Kebnekajse, 1946-61.  |

THE COMMISSION OF SNOW & ICE (International Association of Hydrology of the International Union of Geodesy and Geophysics).

- 1) Symposium on the variations of the regime of existing glaciers, Obergurgl, September 10 - 18, 1962

Submission of papers:-

Authors, National Correspondents of the Commission and National Committees of Hydrology are reminded that:

- i) Three copies of the titles and abstracts in both English and French languages must be delivered to the Secretary of the Commission not later than 1 February 1962.
- ii) Three copies of the complete paper, including abstracts in both English and French languages must be delivered to the Secretary not later than 1 April 1962.
- iii) Authors should not send their abstracts or papers direct to the Secretary, but to the National Committees of Hydrology or the National Correspondents of the Commission in their country, who are responsible for selecting the papers. A list of the names and addresses of National Correspondents so far appointed is attached and in other countries the abstracts and papers should be sent to the National Committee of Hydrology.
- iv) The contents, length and form of the papers which must be adhered to has already been circulated and was published in "ICE" July 1961. The number of reprints each author requires should be clearly stated at the top of the paper.



- v) The number of people who have indicated a definite intention to submit a paper to the Symposium is greater than the total number of papers which can be accepted (about 40). In addition there are a large number of people who have stated that they may possibly submit a paper. National Correspondents and Committees of Hydrology should bear this situation in mind and only submit to the Secretary papers of high quality.
- vi) Papers received by the Secretary after 1 April 1962 cannot be accepted.

2) Meeting of the Working Group on Glaciology of the Special Committee for Antarctic Research (SCAR) at Obergurgl, September 1962.

The above-mentioned group (about 20 people) will be holding a meeting at Obergurgl (19 - 22 September), immediately following the Symposium organised by the Commission of Snow and Ice. Members of this Working Group are invited by the Commission to attend their Symposium and should register in the same way as other attendants.

Members of the Working Group will be accommodated in the Bundessportheim and hold their meetings there. They are proposing to discuss:-

- 1) the techniques and applications of geophysical prospecting in the Antarctic, particularly seismic and electrical methods;
- 2) the use of isotopes in glaciology;

and have invited those people attending the Commission's Symposium who have special knowledge and experience of these techniques to attend the discussions. The Secretary of the SCAR Working Group on Glaciology is C. Lorius, Collège de France, Place Marcellin Berthelot, Paris 5, France.

W. H. Ward, Secretary, Commission of Snow and Ice,  
147, Rickmansworth Road, Watford, Hertfordshire, England.

December 1961

3) List of names and addresses of National Correspondents to the Commission of Snow and Ice

- AUSTRIA: Prof. H. Hoinkes, Institut für Meteorologie und Geophysik, Schopfstrasse 41, Innsbruck.
- CANADA: Dr. G. Hattersley-Smith, Department of National Defence, Defence Research Board, Ottawa, Ontario.
- DENMARK: Dr. Børge Fristrup, Universitetets, Geografiske Institut, Kejsergade 2, Copenhagen K.
- FINLAND: Dr. E. Palosuo, Merentutkimuslaitos, Tähtitorninkatu 2, Helsinki.
- FRANCE: M. R. G. Millecamps, Laboratoire de Géologie, Collège de France, Place Marcellin Berthelot, Paris 5.
- FEDERAL REPUBLIC OF GERMANY: Direktor J. Völk, Bayerische Landesstelle für Gewässerkunde, Prinzregentenstrasse 24, München 22.
- HOLLAND: Mr. P. J. Wemelsfelder, Rijkswaterstaat, Directie Waterhuishouding en Waterbeweging, Koningskade 25, The Hague.
- ITALY: Prof. Solaini, Politecnico, Piazza da Vinci, Milan.
- JAPAN: Prof. Dr. Takeo Hori, Institute of Low Temperature Science, Hokkaido University, Sapporo.
- POLAND: Prof. Dr. A. Kosiba, Uniwersytetu Wrocławskiego, Cmentarna St. 13, Wrocław 9.
- U.S.A.: Dr. M. F. Meier, U.S. Geological Survey, 529 Perkins Building, Tacoma 2, Washington.
- U.S.S.R.: Prof. G. Avsiuk, Geographical Institute, Academy of Sciences, U.S.S.R., Storo Monetriy 29, Moscow.
- UNITED KINGDOM: Prof. G. Manley, Department of Geography, Bedford College, Regents Park, London N.W.1.
- NEW ZEALAND: Mr. A. P. Campbell, Soil Conservation and Rivers Control Council, Box No. 8024, Wellington.

4) Symposium on Continental Erosion, Bari, Italy, October 1962.

This symposium is being organised by the Commission on Land Erosion, and the Commission of Snow and Ice are invited to submit papers on Glacial Erosion and to attend the meeting. There will be a display at the meeting of maps showing the effects of soil erosion, of aerial photographs and their use in the study of erosion, and of instruments used for measuring erosion and fluvial transport of solids. The organiser of the symposium is Prof. L.J. Tison (62 Rue des Ronces, Gentbrugge, Belgium) and titles and summaries of papers for the meeting should be sent to him by 1 March 1962. The complete text is required by 1 June 1962. Further details of the programme for the symposium may be obtained from Prof. Tison. National Correspondents of the Commission of Snow and Ice are asked to draw the matter to the attention of glaciologists working on problems of glacier erosion.



**Hans Wilson Ahlmann**

Hans Ahlmann was born at Karlsborg, Sweden, on 14 November 1889. He was educated at Stockholm and Uppsala Universities and awarded the degree of Doctor of Philosophy at Stockholm where he was appointed Docent in 1915. In 1920 he transferred to Uppsala University as Docent, then in 1929 he returned to Stockholm University where he became Professor and Director of its Geographical Department.

As far back as 1916 he had begun his researches in geomorphology in Norway; these were written up in "Geografiska Annaler" in 1919. A few years later he undertook glaciological research in Jotunheimen, and his findings were published in the same journal a few years later. During the nineteen-twenties he carried out research in human geography in Scandinavia, Italy and Libya. In 1931 he led the Swedish-Norwegian Arctic Expedition to Nordaustlandet and its surrounding waters. Three years later he became joint leader, with H. U. Sverdrup, of the Norwegian-Swedish Spitsbergen Expedition. In the years 1936-38 he and Jon Eythórsson led the Swedish-Icelandic Expeditions to Vatnajökull.

In 1939-40 Ahlmann took charge of the Swedish-Norwegian glaciological research work in Nordaustlandet. The results of all these investigations were published in "Geografiska Annaler" in the years 1933, 1935, 1937-39 and 1941-42.

His next important task was the preparation of a paper on glaciers and their relationship to present climatic fluctuation, based on the many investigations he had carried out ever since 1918. "Glaciological Research on the North Atlantic Coasts" was published by the Royal Geographical Society in London in 1948 as R. G. S. Research Series, No. 1.

It was largely due to the enthusiasm and initiative of Ahlmann that the idea of the Norwegian-British-Swedish Antarctic Expedition of 1949-52 took root. Ahlmann was chairman of the Swedish Organising Committee, and was responsible for the type of glaciological programme carried out.

This is only a brief summary of some of the more important of Ahlmann's glaciological researches, and makes no detailed mention of, for example, his work in the Kebnekajse Massif in Swedish Lapland, nor of much else.

From 1950 until 1956 Ahlmann was Swedish Ambassador to Norway. During this period his scientific work naturally took second place, but in 1952 he was able to visit the United States and to give the Isaiah Bowman Memorial Lecture to the American Geographical Society in New York. This was published in 1953 as "Glacier Variations and Climatic Fluctuations" in a booklet with an appreciative foreword by W. O. Field. During his period as Ambassador he also devoted time to the International Geographical Union. He became President of the Union from 1956 to 1960, and was Chairman of the Organizing Committee of the XIXth International Congress in the Norden in July-August 1960.

In 1956 Ahlmann retired from active life, and since then with his wife he has travelled abroad extensively, in his own words "to see with my own eyes what I have been teaching my students for 40 years!"

For many years he has been a good friend to many individual members of this Society, and to the Society itself ever since its foundation. He wrote the Foreword to the first number of the first volume of the "Journal of Glaciology" which was issued in January 1947. He has continued that friendship ever since and it is a very great pleasure indeed to welcome him as an Honorary Member.



## Glaciologists and Antarctic Place-names

by Brian Roberts

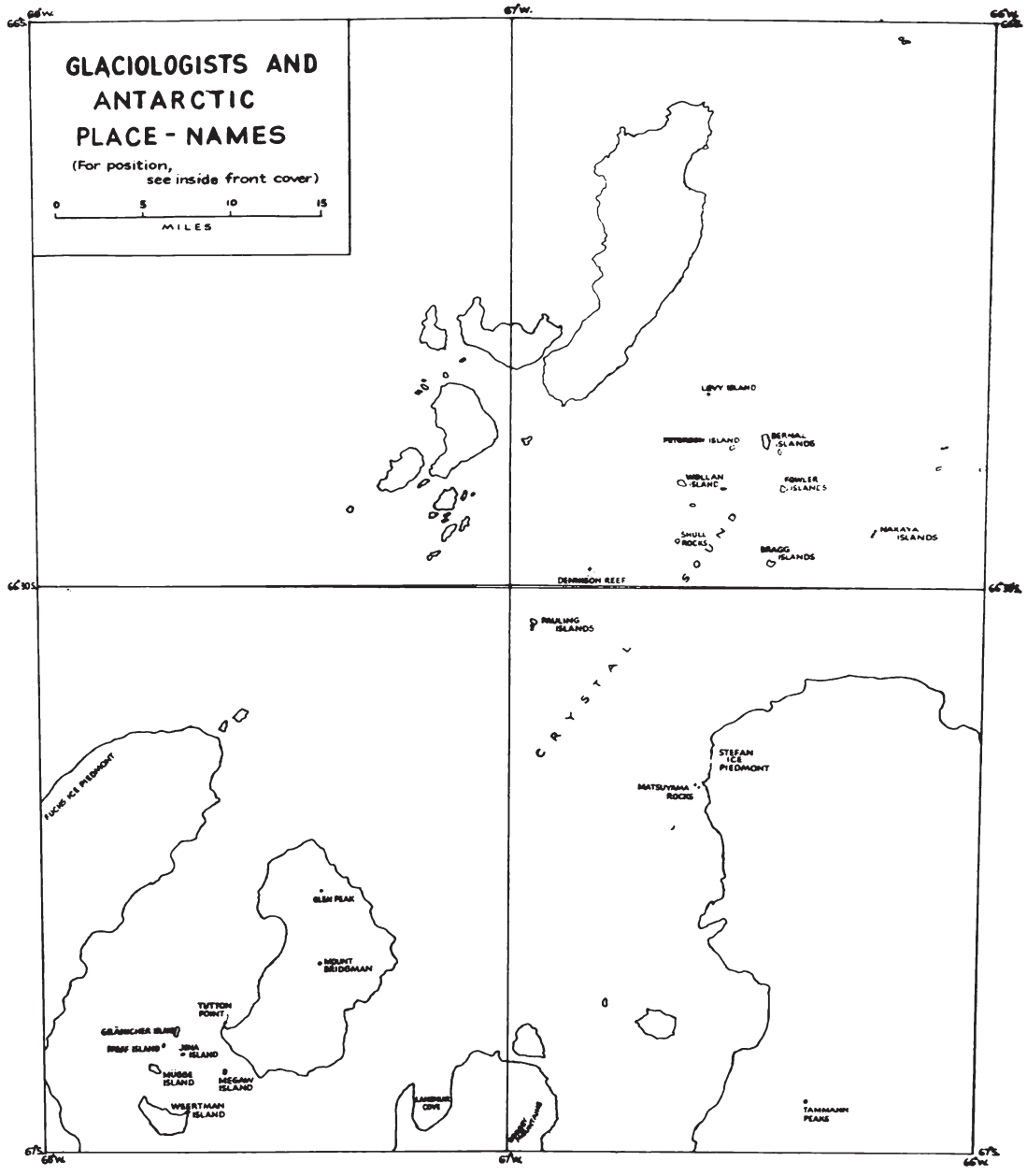
It is well known that a tremendous amount of topographical survey has been done in the Antarctic during the past decade. It is not so well known that the selection of place-names to be shown on the new maps has been a problem of exceptional complexity.

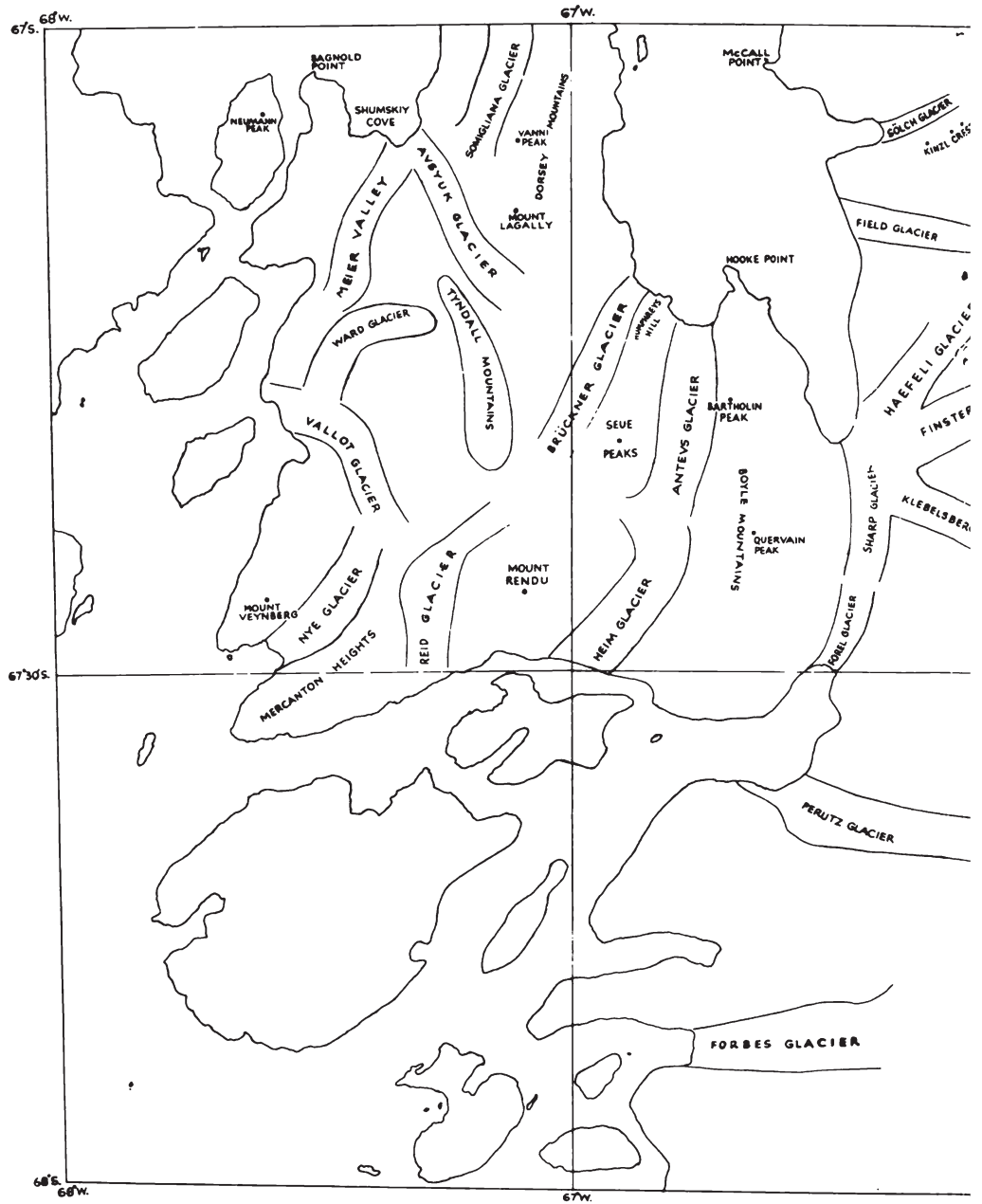
Names are essential for every narrative of field activities and for most scientific reports, but the political situation, with conflicting territorial claims, has precluded all the normal procedures that stem from sovereignty and recognized administrative authority. Not even the Antarctic Treaty of 1959 could help to solve this problem, and it has been necessary to evolve rather unorthodox methods. The place-names authorities of most of the nations concerned have undertaken formal or informal discussions (depending on recognition or non-recognition of sovereignty) to enable each to make independent but similar recommendations to their governments.

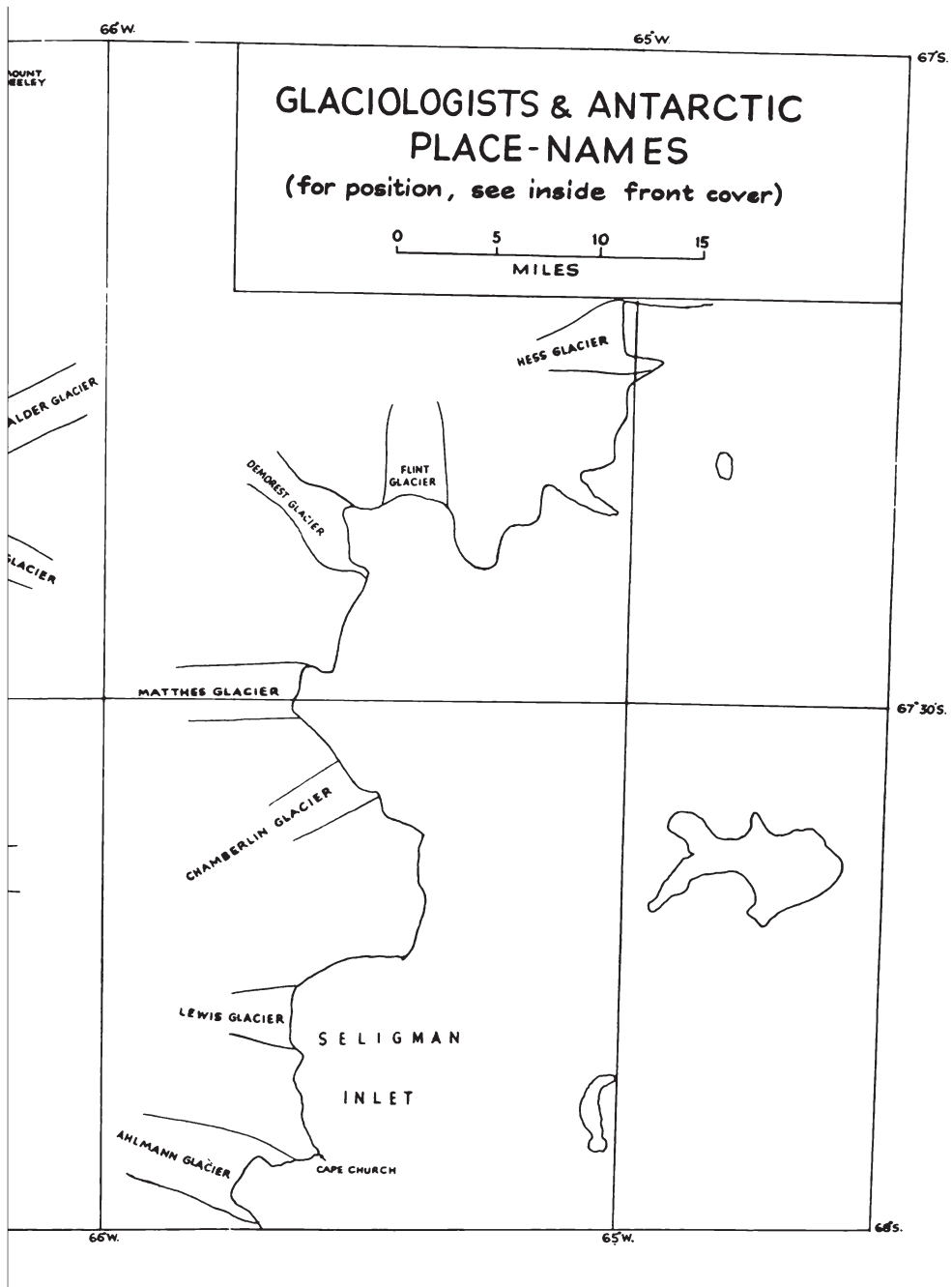
The present note is concerned only with the sector between longitudes 20° W. and 80° W. (the Falkland Islands Dependencies). The Antarctic Place-names Committee has been the British authority responsible for recommending names for this area. It has been necessary to think of many thousands of new names, to define the features and their relationships, and then to seek international agreement on their general acceptance. The problem has been to find names which would be internationally acceptable. When orthodox principles had been exhausted, e. g. descriptive names, and the names of those who first worked in the area, it was decided to adopt further names based on "groups of associated ideas". Many of these "groups" have now been developed, especially the names of pioneers in the techniques which have helped to elucidate Antarctic problems. Some examples are: pioneers of aviation, photography, photogrammetry, navigation, medicine, cold climate physiology, oceanography, the planets and their satellites, musical composers. Naturally, glaciologists have been included in a land where ice so greatly predominates. The area of land in this sector is about 500,000 sq. miles. Rather more than 3500 names have now been officially adopted for British official use. About half of these originate in "idea groups".

Members of the Society will be interested to know about the glaciologists who have so far been honoured. The names listed below have been finally approved. They are also accepted for official use by the mapping authorities in Australia and New Zealand, and have been agreed by the United States Board on Geographic Names. Some of these names have already been published in the latest editions of the relevant Admiralty charts. Others will appear in the 1:200,000 series of maps being published by the Directorate of Overseas Surveys.

The accompanying sketch maps have been reduced from unpublished provisional sheets prepared for the Antarctic Place-names Committee. It is not possible to show all of the names listed because some of them (mainly after men who have done field work in this part of the Antarctic) are widely scattered. The general principle is illustrated by the names of investigators of the structure of ice crystals grouped together in Crystal Sound.







NAME	POSITION	NOTES
Adie Inlet	66° 28'S. , 62° 20' W.	R. J. Adie (GB) b.1925; geologist, editor "Journal of Glaciology".
Ahlmann Glacier	67° 52'S. , 65° 43' W.	Hans W:son Ahlmann (Sweden) b. 1889; geographer, study of world climatology through behaviour of glaciers.
Antevs Glacier	67° 20'S. , 66° 48' W.	E. V. Antevs (USA) b. 1888; glacial geologist.
Armstrong Reef	65° 54'S. , 66° 18' W.	T. E. Armstrong (GB) b. 1920; geographer, sea ice specialist.
Avsyuk Glacier	67° 10'S. , 67° 13' W.	G. A. Avsyuk (USSR); specialist on glaciers of central Asia, author of best current scheme for classifying glaciers.
Bader Glacier	67° 37'S. , 66° 45' W.	H. Bader (USA, formerly Switzerland) b. 1907; engineering geologist, mineralogist.
Bagnold Point	67° 02'S. , 67° 29' W.	R. A. Bagnold (GB) b. 1896; author of "The physics of blown sand and desert dunes" (London, 1941) which stimulated similar studies in snow.
Barnes Glacier	67° 32'S. , 66° 25' W.	H. T. Barnes (Canada); physicist, pioneer of ice engineering.
Bartholin Peak	67° 17'S. , 66° 40' W.	E. Bartholin (Denmark); author of "De figura nivis dissertatio", which includes earliest known scientific description of snow crystals.
Bentley Crag	67° 17'S. , 66° 53' W.	W. A. Bentley (USA); photographer, joint author of "Snow crystals" (New York, 1931).
Bernal Islands	66° 22'S. , 66° 28' W.	J. D. Bernal (GB) b. 1901; physicist; joint author with Sir R. Fowler (see Fowler Islands) of paper on structure of ice which suggested location of hydrogen atoms (1933).
Bertram Glacier	70° 48'S. , 67° 20' W.	G. C. L. Bertram (GB) b. 1911; member of BGLE 1934-37, Director of Scott Polar Research Institute 1949-56.
Bertrand Ice Piedmont	68° 31'S. , 67° 05' W.	K. J. Bertrand (USA); geographer.
Boyle Mountains	67° 21'S. , 66° 38' W.	R. Boyle (GB) 1627-91; author of "New experiments and observations touching cold" (London, 1665) and "Essay on gems" (London, 1672), one of earliest known descriptions of ice crystals.
Bragg Islands	66° 28'S. , 66° 27' W.	Sir W. H. Bragg (GB) 1862-1942; physicist, interpreted X-ray measurements to give location of oxygen atoms in structure of ice.
Bridgman, Mount	66° 48'S. , 67° 23' W.	P. W. Bridgman (USA) b. 1882; physicist, discovered high-pressure forms of ice.
Brockamp Islands	67° 17'S. , 67° 56' W.	B. Brockamp (Germany) b. 1902.
Bruckner Glacier	67° 19'S. , 67° 00' W.	E. Brückner (Germany) 1862-1927; glacial geologist, founder of "Zeitschrift für Gletscherkunde" in 1907 and editor until 1927.
Brunt Ice Shelf	75° 30'S. , 25° 00' W.	Sir D. Brunt (GB) b. 1886; meteorologist; Physical Secretary of the Royal Society, 1948-57; responsible for initiating R. S. I. G. Y. Expedition to Halley Bay in 1955.
Bucher Glacier	67° 39'S. , 66° 50' W.	E. Bucher (Switzerland); Director of Eidg. Schnee- und Lawinenforschungsinstitut, Weissfluhjoch, Davos, until 1949.
Chamberlin Glacier	67° 34'S. , 65° 31' W.	T. C. and R. T. Chamberlin (USA); geomorphologists.
Church, Cape	67° 51'S. , 65° 35' W.	J. E. Church (USA) 1869-1959; developed technique of snow surveying and meltwater run-off forecasts.



NAME	POSITION	NOTES
Court Nunatak	73° 22'S. , 61° 36' W.	A. Court (USA) b. 1914; meteorologist.
Debenham Islands	68° 08'S. , 67° 07' W.	F. Debenham (GB) b. 1883; Professor of Geography at Cambridge University, 1930-49; Founder and first Director of Scott Polar Research Institute, 1925-46.
Deeley, Mount	67° 01'S. , 66° 13' W.	R. M. Deeley (GB) 1855-1954; geologist, investigated structure and flow of glaciers.
Demorest Glacier	67° 23'S. , 65° 32' W.	M. H. Demorest (USA) 1910-42.
Dennison Reef	66° 29'S. , 66° 50' W.	D. M. Dennison (GB) b. 1900; physicist, took X-ray diffraction pictures, used to interpret crystal structure of ice.
Dorsey Mountains	67° 03'S. , 67° 03' W.	N. E. Dorsey (USA) 1873-1959; physicist, wrote "Properties of ordinary water-substances (New York, 1940), comprehensive study including all work on ice.
Drygalski Glacier	64° 44'S. , 61° 00' W.	E. von Drygalski (Germany) 1865-1949; geographer, polar explorer.
Field Glacier	67° 09'S. , 66° 23' W.	W. O. Field (USA) b. 1904; glacier studies in Alaska.
Finsterwalder Glacier	67° 18'S. , 66° 10' W.	S. and R. Finsterwalder (Germany) 1862-1951 and b. 1899; Richard adapted photogrammetric methods for measuring glacier flow.
Fleming Glacier	69° 12'S. , 67° 10' W.	W. L. S. Fleming (GB) b. 1906; geologist, member of BGLE 1934-37; now Bishop of Norwich.
Flint Glacier	67° 21'S. , 65° 25' W.	R. F. Flint (USA) b. 1902; glacial geomorphologist, author of "Glacial and Pleistocene geology" (New York).
Forbes Glacier	67° 48'S. , 66° 30' W.	J. D. Forbes (GB) 1809-68; physicist, accurate observations on glaciers.
Forel Glacier	67° 27'S. , 66° 29' W.	F. A. Forel (Switzerland) 1841-1912; first President of International Commission of Glacier Fluctuation; discoverer of fine striae in glacier crystals which now bear his name.
Fowler Islands	66° 24'S. , 66° 25' W.	Sir R. Fowler (GB) 1889-1944; physicist; joint author with J. D. Bernal of classic paper (see Bernal Islands).
Fuchs Ice Piedmont	67° 14'S. , 68° 31' W.	Sir V. E. Fuchs (GB) b. 1908; Director of Falkland Islands Dependencies Survey; geologist.
Glen Peak	66° 46'S. , 67° 20' W.	J. W. Glen (GB) b. 1927; physicist, laboratory investigations on flow of single and polycrystalline ice; editor "Journal of Glaciology".
Granicher Island	66° 53'S. , 67° 43' W.	W. H. H. Gränicher (Switzerland) b. 1924; physicist; investigations of electrical and mechanical properties of ice in relation to its molecular structure.
Haefeli Glacier	67° 16'S. , 66° 22' W.	R. Haefeli (Switzerland) b. 1898; glacier physicist, chairman of Schweizerische Gletscher-Kommission.
Heim Glacier	67° 27'S. , 66° 52' W.	A. Heim (Switzerland); author of first complete study of glaciers from micro-structure to world-wide distribution.
Herdman, Cape	72° 39'S. , 60° 37' W.	H. F. P. Herdman (GB); oceanographer, member of "Discovery" investigations.
Hess Glacier	67° 13'S. , 65° 01' W.	H. Hess (Germany); author of "Die Gletscher" (Braunschweig, 1904).
Hobbs Glacier	64° 18'S. , 57° 26' W.	W. H. Hobbs (USA) 1864-1953.
Hooke Point	67° 11'S. , 66° 42' W.	R. Hooke (GB) 1635-1703; author of "Micrografia, or some physiological descriptions

NAME	POSITION	NOTES
		of minute bodies made by magnifying glass" (London, 1665), contains one of earliest known descriptions of ice crystals; employed for many years by Robert Boyle (see Boyle Mountains).
Humphreys Hill	67° 14'S. , 66° 50'W.	W. J. Humphreys (USA) 1862-1949; meteorologist; joint author with W. A. Bentley (see Bentley Crag) of "Snow crystals" (New York, 1931); specialist on effects of ice in atmosphere.
Jona Island	66° 54'S. , 67° 41'W.	F. P. Jona (USA) b. 1922; physicist, accurate determination of elastic constant of ice single crystal, in 1951.
Kidd Islands	66° 27'S. , 65° 59'W.	D. A. Kidd (GB); with J. C. McConnell (see McConnell Islands), made pioneer tests of deformation of ice single crystals, in 1888.
Kinzl Crests	67° 05'S. , 66° 18'W.	H. Kinzl (Austria) b. 1898.
Klebensberg Glacier	67° 24'S. , 66° 15'W.	R. von Klebensberg (Austria) b. 1886; editor of "Zeitschrift für Gletscherkunde" 1927-43.
Koechlin Island	66° 42'S. , 67° 38'W.	R. Koechlin (Switzerland); author of "Les glaciers et leur mécanisme" (Lausanne, 1944).
Lagally, Mount	67° 09'S. , 67° 06'W.	M. Lagally (Germany) 1881-1945; mathematician, studies of mass and heat balance of glaciers.
Langmuir Cove	66° 58'S. , 67° 10'W.	I. Langmuir (USA) b. 1881; physicist, studied formation of snow.
Levy Island	66° 22'S. , 66° 32'W.	H. A. Levy (USA) b. 1913; physical chemist, with S. W. Peterson (see Peterson Islands) determined location of hydrogen atoms in ice by neutron diffraction, in 1957.
Lewis Glacier	67° 45'S. , 65° 38'W.	W. V. Lewis (GB) 1907-61; geographer, geomorphological effects of glaciers.
Lyell Glacier	54° 17'S. , 36° 38'W.	Sir C. Lyell (GB) 1797-1875; geologist.
Mackintosh, Cape	72° 53'S. , 60° 03'W.	N. A. Mackintosh (GB) b. 1900; marine biologist, oceanographer, member of "Discovery" investigations.
Maling Peak	60° 40'S. , 45° 42'W.	D. H. Maling (GB) b. 1923; geographer.
Matsuyama Rocks	66° 40'S. , 66° 35'W.	M. Matsuyama (Japan) b. 1884; geologist, laboratory studies of crystal forms of ice, in 1920.
Matthes Glacier	67° 30'S. , 65° 38'W.	F. E. Matthes (USA) 1874-1948; glacial geomorphologist.
McCall Point	67° 01'S. , 66° 36'W.	J. G. McCall (USA) 1923-54; engineer, first measured detailed internal movement of cirque glacier, in 1951-52.
McConnel Islands	66° 29'S. , 65° 51'W.	J. C. McConnell (GB) 1860-90; physicist, deformation tests (see Kidd Islands).
Megaw Island	66° 55'S. , 67° 36'W.	Helen D. Megaw (GB) b. 1907; physicist, accurate measurements of cell dimensions of ice, in 1934.
Meier Valley	67° 08'S. , 67° 24'W.	M. F. Meier (USA) b. 1925; geologist, first detailed study of strain all over surface of glacier.
Mercanton Heights	67° 30'S. , 67° 27'W.	P. L. Mercanton (Switzerland) b. 1876; doyen of Swiss glaciologists, for many years secretary of Commission of Snow and Ice.
Mugge Island	66° 55'S. , 67° 45'W.	J. O. C. Mugge (Germany) 1858-1932; mineralogist, studies of plasticity of ice, in 1895.
Nakaya Islands	66° 27'S. , 66° 14'W.	U. Nakaya (Japan) b. 1900; physicist, investigations of structure and properties of single ice crystals and snow flakes.

NAME	POSITION	NOTES
Neumann Peak	67° 04'S. , 67° 34' W.	F. E. Neumann (Germany) 1798-1895; physicist, thermal conductivity of ice.
Nye Glacier	67° 26'S. , 67° 29' W.	J. F. Nye (GB) b. 1923; physicist, theoretical contributions to study of flow of glaciers and ice sheets, since 1951.
Palosuo Islands	65° 37'S. , 66° 05' W.	E. Palosuo (Finland); oceanographer, sea ice studies.
Pauling Islands	66° 32'S. , 66° 57' W.	L. C. Pauling (USA) b. 1901; chemist, originator of theory of structure of ice.
Perutz Glacier	67° 37'S. , 66° 25' W.	M. F. Perutz (GB) b. 1914; important studies of mechanism of glacier flow.
Peterson Island	66° 22'S. , 66° 32' W.	S. W. Peterson (USA) b. 1917; physical chemist, location of hydrogen atoms in ice (see Levy Island).
Pfaff Island	66° 54'S. , 67° 44' W.	A. B. I. F. Pfaff (Germany) 1825-86; physicist, pioneer investigations of plastic deformation of ice, in 1874-76.
Quervain Peak	67° 24'S. , 66° 38' W.	A. de Quervain (Switzerland) 1879-1927; glaciologist, photogrammetric methods for measurement of surface flow.
Reid Glacier	67° 28'S. , 67° 17' W.	H. F. Reid (USA) 1859-1944; studies of glacier flow and stratification.
Reece, Mount	63° 50'S. , 58° 32' W.	A. Reece (GB) 1921-60; geologist.
Rendu, Mount	67° 28'S. , 67° 04' W.	L. Rendu (France) 1789-1859; Bishop and scientist, author of "Théorie des glaciers de la Savoie" on mechanism of glacier flow (Chambery, 1840).
Roberts Ice Piedmont	69° 00'S. , 70° 20' W.	B. B. Roberts (GB) b. 1912; geographer, member of BGLE 1934-37.
Robin Peak	60° 41'S. , 45° 38' W.	G. de Q. Robin (Australia) b. 1921; physicist, Director of Scott Polar Research Institute since 1958.
Searle, Mount	67° 49'S. , 67° 15' W.	D. J. H. Searle (GB) b. 1928; geographer.
Seligman Inlet	67° 50'S. , 65° 32' W.	G. Seligman (GB) b. 1886; founder in 1936 and President of British Glaciological Society, founder in 1947 and Editor "Journal of Glaciology"; author of "Snow structure and ski fields" (London, 1936).
Seue Peaks	67° 19'S. , 66° 55' W.	C. N. de Seue (Norway) 1841-95; surveyor, measurements of glacier flow.
Sharp Glacier	67° 23'S. , 66° 30' W.	R. P. Sharp (USA) b. 1911; geologist, glacier flow.
Shull Rocks	66° 27'S. , 66° 40' W.	C. G. Shull (USA) b. 1915; physicist, neutron diffraction to determine position of hydrogen atoms in ice.
Shumskiy Cove	67° 04'S. , 67° 21' W.	P. A. Shumskiy (USSR); author of standard work on petrology of ice.
Simpson Head	73° 21'S. , 60° 59' W.	Sir G. C. Simpson (GB) b. 1878; meteorologist.
Solch Glacier	67° 04'S. , 66° 21' W.	J. Sölch (Austria) 1883-1951; glacial geologist.
Somigliana Glacier	67° 02'S. , 67° 08' W.	C. Somigliana (Italy) 1859-1955; mathematician and physicist, viscous theory of glacier flow.
Sorge Island	67° 11'S. , 67° 43' W.	E. F. W. Sorge (Germany) 1899-1946; first seismic soundings of Greenland ice sheet, 1929 and 1930-31.
Stefan Ice Piedmont	66° 40'S. , 66° 30' W.	J. Stefan (Austria) 1835-93; physicist, theory of heat flow in freezing ice layer and its use to calculate rates of sea ice growth in Arctic, 1889.
Stefansson Sound	69° 26'S. , 62° 37' W.	V. Stefansson (USA) b. 1879; geographer.

NAME	POSITION	NOTES
Steinemann Island	66° 51'S. , 67° 56'W.	S. Steinemann (Switzerland); physicist, laboratory investigations on flow of single and polycrystalline ice.
Stephenson, Mount	69° 49'S. , 69° 43'W.	A. Stephenson (GB) b. 1908; geographer, member of BGLE 1934-37.
Tamman Peaks	66° 57'S. , 66° 10'W.	G. H. J. A. Tamman (Germany) b. 1861; physical chemist, physical properties of ice, 1900-35.
Thomsen Islands	65° 47'S. , 66° 16'W.	H. Thomsen (Denmark); meteorologist, editor since 1946 of annual reports on sea ice in the Arctic, issued by Danske Meteorologiske Institut, København.
Tutton Point	66° 51'S. , 67° 33'W.	A. E. H. Tutton (GB) 1864-1938; mineralogist.
Tyndall Mountains	67° 15'S. , 67° 33'W.	J. Tyndall (Ireland) 1820-93; mountaineer, works on glaciers and physical properties of ice.
Vallot Glacier	67° 21'S. , 67° 24'W.	J. Vallot (France) 1854-1925; naturalist, first measurements of surface velocity of glacier over long period, 1891-99.
Vanni Peak	67° 05'S. , 67° 06'W.	M. Vanni (Italy) b. 1898; hydrologist, secretary of Comitato Glaciologico Italiano.
Veynberg, Mount	67° 27'S. , 67° 34'W.	B. P. Veynberg (USSR) b. 1871; physicist, mechanical properties and flow of ice in laboratory.
Wager Glacier	69° 48'S. , 69° 25'W.	L. R. Wager (GB) b. 1904; Professor of Geology at Oxford University since 1950.
Ward Glacier	67° 15'S. , 67° 25'W.	W. H. Ward (GB) b. 1917; engineer, ice velocity at depth in glaciers, secretary of Commission of Snow and Ice.
Weertman Island	66° 58'S. , 67° 44'W.	J. Weertman (USA); metallurgist, theory of slip of glaciers on their beds, contributions to theory of glacier flow, since 1956.
Wollan Island	66° 25'S. , 66° 28'W.	E. O. Wollan (USA) b. 1902; physicist, neutron diffraction studies of structure of ice.
Wordie Ice Shelf	69° 15'S. , 67° 45'W.	Sir J. M. Wordie (GB) b. 1889; geologist, Chairman of F. I. D. Scientific Committee 1948-56.
Workman Rocks	66° 23'S. , 65° 42'W.	E. J. Workman (USA) b. 1899; physicist, electrical properties of ice.
Zubov Bay	65° 42'S. , 65° 52'W.	N. N. Zubov (USSR) 1885-1960; oceanographer, author of numerous works on Arctic sea ice.
Zukriegel Island	65° 54'S. , 65° 47'W.	J. Zukriegel (Czechoslovakia); geographer, sea ice.

### News from Universities

MELBOURNE UNIVERSITY, AUSTRALIA. A lectureship in glaciology has been established and will be advertised soon.

INSTITUTE OF POLAR STUDIES, OHIO STATE UNIVERSITY, U.S.A. For 1962 - 63 a Fellowship of \$2800 is advertised, for graduate studies toward any advanced degree involving research in polar or alpine areas, including geology, geography. Also, for summer 1962 an Exchange Fellowship of \$750 is advertised for graduate studies toward any advanced degree involving research in polar areas, including glaciology, glacial geology, geomorphology; the recipient will attend the summer field station at Kebnekajse, Sweden. Further details and application forms may be obtained from the Dean of the Graduate School, Ohio State University, 164 W. 19th Avenue, Columbus 10, Ohio, U.S.A. Applications must be filed before 15 February 1962.

GLACIAL GEOLOGY AND POLAR RESEARCH LABORATORY, UNIVERSITY OF MICHIGAN. The Institute of Science and Technology in the University created this new Laboratory in 1961. The Laboratory, headed by Professor James H. Zumberge, is engaged in glaciological

investigations in the Antarctic and glacial geological investigations in the Great Lakes region. One of the main purposes of the laboratory is to apply knowledge learned in modern glaciated regions to areas that were covered by ice sheets during the Pleistocene. The research programme is currently supported by the National Science Foundation and the University of Michigan.

#### REPORT OF THE UNIVERSITY COMMITTEE ON POLAR RESEARCH. (U.S.A., 1961).

In recognition of the importance of institutions of higher learning in polar research, Dr. Laurence M. Gould, chairman of the Committee on Polar Research of the National Academy of Sciences, appointed a 14-man committee to investigate the way in which American colleges and universities could most effectively engage in polar research. Professor James H. Zumberge was appointed chairman of the committee.

The committee sent questionnaires to 91 academic institutions known to have interest in polar studies. Ten different subject categories were surveyed: geophysics of the solid earth, physics of the upper atmosphere, meteorology and climatology, oceanography, geology, glaciology, soil science, biological sciences, health sciences, anthropology-archaeology.

The report on glaciology, by Professor R. P. Goldthwait, is summarised here:

21 universities and colleges indicated some activity in glaciology. Much of this is true study of glaciers although a few universities are probably more concerned with the glacial geology of deposits. Glaciology is incorporated in 14 geology departments, 3 departments of geology and/or geophysics, 2 combinations with geography, 2 engineering departments, and 1 meteorology department.

40 professional academic men claim to do glaciological research, but in only 2 new cases is this the man's sole field of research (Universities of Alaska and Miami). 9 of the most active are geomorphologists. The graduate students active in glaciology make up about 5% of all earth science graduate students at the 21 institutions, and less than 1% of all graduate students in the U.S.A.

Glaciology is listed as a major part of some one course given at each of 6 colleges and universities. Only 1 (California Institute of Technology) actually lists "glaciology", but 4 others plan such courses.

Special facilities for glaciology are extremely limited. Most commonly (7 examples) there is access to cold rooms, although only 2 cold rooms are devoted chiefly to glaciological research. More than half of the institutions indicate no special glaciological instruments for teaching or research. 2 have special polar libraries (Dartmouth College and University of Michigan), and nearly half the host departments have significant libraries of polar books. Only one (University of Michigan) stores ice specimens yet. Volumes of original I.G.Y. - I.G.C. data are kept at one (Ohio State University), but the only large glacier photo-map collection is not at a university, though one is in progress at the University of Washington.

Past research degrees based on glaciological work number 11 masters' and 8 doctorates in 5 years and concentrated at just 6 universities. Ohio State University leads with 5, but these involve just Arctic areas. The Antarctic comes into its own with I.G.Y. inclusion of a glaciology program so that about half of the 14 advance degrees now in progress are in Antarctic research. Faculty research at present involves 17 projects at 10 universities.

#### Recommendations of the Committee:

1. Financial support for investigations of polar problems at colleges and universities must be greatly increased, with emphasis on the basic research needed to solve the problems. Further, the support must provide for long-term continuity.
2. Every effort must be made to increase scientific manpower in polar research.
3. Substantial and reliable logistic support for polar field investigations must be regularly available and must be directed specifically toward scientific objectives.
4. More polar "centers" or "institutes" should be established within the institutional frameworks of colleges and universities. Conversely, we strongly recommend that no single or monolithic center or institute be established by either the Federal Government or by a group of academic institutions.
5. Each scientific field within the National Science Foundation should develop a program of financing specifically for Arctic research and that each review panel include university investigators active in Arctic work.
6. Full utilization should be made of the experience and competence of academic polar scientists by governmental and other agencies interested in polar problems through an Association of Universities for Polar Research.

## News in brief

The Falkland Islands Dependencies Survey has been re-named. As from 1 January 1962 the Survey will be known as the British Antarctic Survey. Two members of the Survey, based on Halley Bay, have recently broken a new trail to the Tottan Mountains by dog-sledge, the first time the mountains have been reached overland. Colin Johnson, base leader at Halley Bay, and Dennis Ards took 6 weeks over the journey and have opened up a route reported to be suitable for tractors all the way. The Tottans thus become accessible for investigation by the Survey.

A. Bauer, scientist responsible for glaciology to the French National Committee for Antarctic Research, is making a reconnaissance of the glaciers on the Iles Kerguelen, particularly Cook Glacier, with a view to planning a research programme making a 1:100,000 map of the island.

The Committee on Glaciers, American Geophysical Union, for 1961-64 is as follows:

Mark F. Meier (Chairman), Henri Bader, Charles R. Bentley, William O. Field, Calvin J. Heusser, Edward R. LaChapelle, Robert P. Sharp, J. Weertmann, and Harry Wexler.

A. P. Crary, Chief Scientist of the National Science Foundation's Office of Antarctic Programs (Head: Dr. Thomas O. Jones), and Advisor on Antarctica to the Director of the National Science Foundation, received a U.S. Air Force Incentive Award and the Department of Defense Distinguished Civilian Service Award in recognition of his work for the International Geophysical Year.

Sir Raymond Priestley, Honorary Member of this Society, has been elected President of the Royal Geographical Society.

Werner Rüegg, Professor of Geology at Lima University, was President of a group of young Peruvian research workers (earth sciences) who visited 7 European countries during the summer of 1961.

David D. Smith served as a geologist-glaciologist on the drifting station Arlis II in the Arctic June-September 1961, at the request of the Office of Naval Research, Washington, D. C.

South Pole - To commemorate the 50th anniversary of the arrival at the Pole of parties led by Amundsen and Scott, a stone plaque was brought from Britain by G. de Q. Robin, Director of the Scott Polar Research Institute, and was placed near one of the buildings of the Scott-Amundsen station by T. G. Gjelsvik, Director of the Norsk Polar-institutt. A joint Norwegian-British Exhibition was opened in Oslo on 8 December. Exhibits were lent by the Scott Polar Research Institute and the Falkland Islands Dependencies Survey. A. Stephenson and L. M. F. Forbes (editor of the "Polar Record") attended the opening as representatives from Britain.

U. S. N. S. "Eltanin", a small ice-strengthened cargo ship, has become a scientific laboratory for the U. S. Antarctic Research Program, and will be used for oceanography, meteorology, upper atmosphere studies, biology, submarine geology and geomagnetic studies, and land research such as geology, glaciology and biology in areas not easily accessible by land or air.

Many members of the Society are working for the U. S. Antarctic Research Program in the Antarctic during the present summer season. C. W. M. Swithinbank and A. Rundle are studying the Ross Ice Shelf; M. Mellor, A. J. Gow, R. O. Ramseier are studying the physical properties of snow at the Pole and Byrd Stations; W. E. Long is continuing geological investigations of the Horlick Mountains; T. C. Davis is working in the Mt. Gran dry valley area; T. H. Berg is studying patterned ground in the McMurdo Sound area; J. C. Behrendt and J. R. T. Molholm are making a traverse between Byrd Station and Ellsworth Land; M. B. Giovinetto, W. Heilman, M. Hochstein and J. Clapp are studying the Roosevelt Island ice cap. Carl Benson is visiting Roosevelt Island and Byrd Station to make pit-studies under varying conditions for comparison with similar studies he has made in Greenland.

Winter shipping on the St. Lawrence - the J. Lauritzen Lines of Copenhagen have announced that they will maintain regular sailings in the winter as far as Trois-Rivières, 70 miles N. E. of Montreal. The Lines have assigned to the route four vessels reinforced to navigate in ice. The Canadian Transport Department will not provide an ice-breaker service, but navigation should not prove too difficult, as tidal and current action helps to keep the channel clear.

Voyage of the Atomic Icebreaker Lenin, 1961

A most interesting pioneer voyage was made by the "Lenin" at the end of the 1961 navigation season on the Northern Sea Route. She had not taken part in the normal operations during the summer, but made an appearance only in October. She helped the last convoys in the

region of Proliv Vil'kitskogo, and also took on board here the 14 members of the drifting station "North Pole 10", together with their stores. On 9 October she headed eastwards, and then north-eastwards, until she reached lat.  $75^{\circ} 27' N.$ , long.  $177^{\circ} 10' E.$  (about 450 km. north of Ostrov Vrangelya) on 20 October. Here the new drifting station was established - the first in the series to be brought to its site by sea. Ten days later "Lenin" moved off westwards, and following a course which lay mainly outside the continental slope, deposited on the ice at selected points 15 automatic weather stations. By 12 November she was back in Proliv Vil'kitskogo, and, rounding the northern end of Novaya Zemlya, reached Murmansk on the 22nd. The whole voyage was, of course, much later in the season than usual, or indeed than ever before in certain regions. Much of the route - the northern parts of the East Siberian and Laptev Seas - had never been visited by a ship under its own power. Very close pack ice of 2 m. thickness was often encountered, but this caused the ship no serious difficulty. Aerial reconnaissance was available, in spite of near total darkness.

## Current research on snow and ice

### 1. CANADA

SUMMARY OF CURRENT RESEARCH IN CANADA ON SNOW AND ICE: SNOW AND ICE SUB-COMMITTEE OF THE ASSOCIATE COMMITTEE ON SOIL AND SNOW MECHANICS. The full summary appears as "A.C.S.S.M. Note No. 6", August 1961, Ottawa (National Research Council).

The Meteorological Branch, Department of Transport, is responsible for measuring daily snowfall, depth of snow cover and water equivalent of snowfall; for snow gauge research, radar studies, sea ice observations and forecasting, lake ice observations, and ice thickness observations. The Forestry Department, University of New Brunswick, with the co-operation of the pulp and paper industry, the Division of Building Research and the Meteorological Branch, is studying the building and use of snow roads.

McGill University Field Station and Sub-Arctic Research Laboratory at Schefferville are making studies of snow cover, snow depths in relation to ground temperatures, lake ice, and dates of disappearance of snow cover.

The Snow and Ice Section of the Division of Building Research, National Research Council, (L. W. Gold) is studying the bearing capacity of ice during the normal operations of pulp and paper companies; crack formation in multi-grained columnar ice; creep behaviour of ice beams; thermal studies on snow, ice and water surfaces; avalanche studies for the specification of the defence works for the Trans Canada Highway through Glacier National Park; ice and water content of frozen ground; and investigations on snow roads and ice landings.

The Building Structures Section of the Division of Building Research is carrying out a continuing investigation on snow loads on roofs.

The Hydraulics Section of the Division of Mechanical Engineering, National Research Council, has made a preliminary study of wind inducing circulation in the Gulf of St. Lawrence and has observed ice conditions in the St. Lawrence River below Montreal.

The Low Temperature Laboratories of the Division of Mechanical Engineering are investigating the characteristics of spray nozzles used for making artificial snow; testing the icing characteristics of helicopters; and studying icing at high speeds in a newly constructed wind tunnel.

The Surface Chemistry Section of the Division of Pure Chemistry, National Research Council, is conducting calorimetric investigations into the phase transition of cubic ice to hexagonal ice.

The Navigational Aids Section, Division of Radio and Electrical Engineering, National Research Council, is developing electronic apparatus for telemetering information on wind speed and direction, temperature, and rate of snowfall.

The Department of Biology and Botany, University of British Columbia, is studying the ecology on Mount Seymour, B.C., with a view to assessing the influence on tree growth of snow depths and duration, soil temperatures and moisture content beneath snow pack.

The Department of Geography and Geology, U.B.C., (J. R. Mackay and W. H. Mathews) is investigating the snow creep on Mount Seymour with the object of relating creep velocity at the base of the snow pack to snow depth, snow density, free water content of the snow and angle of slope.

The Aluminium Company of Canada, Ltd., had installed six avalanche maximum pressure recording devices on several of their power-transmission lines at Kemano, B. C., to study the forces involved in heavy wet avalanches of short run. A 300 ft. test span cable has also been installed at the 300 ft. level to determine rime loads on transmission conductors.

The Parks Branch of the Department of Northern Affairs and National Resources (N. C. Gardner) is studying in Glacier National Park shear strength of new snow, and avalanching near the highway through the Park.

The Ice Research Project of the Physics Department, McGill University, (E. R. Pounder) is making seismic studies of ice thickness by an airborne method; measuring the elastic properties of sea ice by transmission times of supersonic pulses through an ice cylinder; studying the crystal structure of sea ice, the thermal balance of an ice cover, micro-profiles of temperature above a freezing surface, freezing rates and crystal orientation, and making a quantitative analysis of sea ice.

The Geophysics Section of the Defence Research Board (T. Harwood) has prepared an ice probability analysis of the Canadian Arctic. Studies have been made of glaciers and snow and ice conditions in northern Ellesmere Island, sea and river ice growth at Fort Churchill, micro-meteorology in Ungava, isotopic content of glacial ice, ice conditions in the Gulf of St. Lawrence, the effect of ice cover on the acoustic properties of sea water. Several of these studies are made under contract to other organizations.

## Reviews

GEOLOGY OF NORWAY. OLAF HOLTEDAHL (Ed.) I. Kommissjon Hos H. Aschehoug & Co., Oslo, 1960. x, 540 p., illus., 22 cm. £4.10.0.

This revised version of "Norges Geologi", rewritten in English, will be widely welcomed. It provides an up-to-date survey of geology, which although confined to Norway, covers much of the science from the metamorphism of Pre-Cambrian rocks to 20th century fluctuation of glaciers. More than a quarter of the book is devoted to the Lower Palaeozoic rocks. Another quarter is concerned with the Quaternary Period during which the present landscape was developed. This deals in considerable detail inter alia with the maximum extent of the last ice sheet, ice recession and shoreline displacement, and pollen analysis in South Norway. A chapter is devoted to the different types and variations in size of present-day glaciers, which are not remnants of the Ice Age but which have been formed in Sub-boreal time. There are numerous diagrams as well as maps, but some of the photographs seem to have suffered from the use of old blocks. The separate folder of plates includes the 1:100,000 map of solid geology in Norway. References to unpublished information show that geological research workers are active in Norway and suggest that this book may stimulate further work.

MOUNT MCKINLEY, ALASKA. A reconnaissance topographic map. BRADFORD WASHBURN. Zürich, Swiss Foundation for Alpine Research, 1960.

This work was published under the auspices of the Museum of Science, Boston, U.S.A., in co-operation with the Swiss Foundation for Alpine Research, Zürich. The map of the Mount McKinley district was prepared by means of vertical photography by the United States Air Force, supplemented by a large number of oblique photographs taken by Mr. Washburn with the assistance of many helpers, and the U.S. Geological Survey, the U.S. Coast and Geodetic Survey, and the National Park Service.

The map itself was made and presented by the Swiss Foundation. It shows excellent continuity with an adjacent sheet published by the U.S. Geological Survey. The area mapped covers 35 x 35 km., and it may come as a surprise to some to note the very large number of glaciers flowing over that whole district. Mr. Washburn is to be congratulated on his enterprise.



PLEISTOCENE GEOLOGY OF THE RANDALL REGION, CENTRAL MINNESOTA. ALLAN F. SCHNEIDER. Minneapolis, University of Minnesota Press, 1960. xviii + 151 p., illus., 23 cm. \$4.25.

This volume gives a general account of the late Wisconsin geological history of central Minnesota based on detailed studies of an area of about 350 square miles. The history is shown to be complex, as at least four different ice lobes advanced on the area in Cary times. The distribution of the various tills and other glacial deposits is described in detail and the laboratory analyses, such as mechanical analysis, heavy minerals and clay analysis, are also discussed. These are accompanied by detailed tables of results. It is unfortunate that in spite of the noted presence of organic materials in the deposits no attempt was made to incorporate any faunal or floral studies in this memoir. This must detract from the value of this fine piece of work to workers outside the areas studied.

## The Society's Library

Works received for the Society's library since May 1961.

We thank the following authors or donors of papers and pamphlets and regret that it is impossible to acknowledge them individually. The glaciological works, with their complete reference, will be listed in the "Glaciological Literature" at the end of the "Journal of Glaciology" and bound in the Society's collection of glaciological papers.

Adie, R. J.	Gold, L. W. (4 items)	Meier, M. F. (2 items)
Ambach, W. (2 items)	Haefeli, R. (2 items)	Mercanton, P. L. (2 items)
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 The Royal Society  
 Union Géodésique et Géophysique Internationale (5 items)  
 U.S. Army Air Force Cambridge Research Laboratories, Bedford, Mass.  
 U.S. Army Attache  
 U.S. Army Cold Regions Research & Engineering Laboratories, Waltham, Mass. (8 items)  
 University of Wrocław, Poland (Institute of Geography)  
 U.S.S.R. All-Union State Library for Foreign Literature (9 items)

#### OTHER BOOKS RECEIVED

- Jahrbuch des Österreichischen Alpen-Vereins (Alpenvereinszeitschrift Bd.85) Innsbruck, Universitätsverlag Wagner, 1960. 207 p., illus., maps, 26 cm.
- Pleistocene Geology of the Randall Region, Central Minnesota, Allan F. Schneider. Minneapolis, The University of Minnesota Press, 1961. 151 p., illus., map insert, 25 cm., \$4.25.
- Paleogeologic Maps. A. I. Levorsen. San Francisco and London, W. H. Freeman and Company, 1961. 174 p., illus., 24 cm., 43s.
- Search in the North. Guy Blanchet. Toronto, Macmillan Company of Canada Limited, 1960. 197 p., illus., 22 cm. (London, Macmillan & Co. 21s.)
- Bibliography and Index of Geology, Exclusive of North America. Marie Siegrist, Mary C. Grier, and others. The Geological Society of America, 1961. 787 p., 25 cm.
- Essai sur les glaciers et sur le terrain erratique du Bassin du Rhône. Jean de Charpentier. Lausanne, 1841. 363 p., map, 22 cm.
- Physical Geography of Asiatic Russia. S. P. Suslov. London, W. H. Freeman and Company Ltd. 1961. 594 p., illus., maps, 26 cm., 105s.

## New Members

New members of the Society since July 1961 are:

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John, Brian S., Jesus College, Oxford.  
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Williams, M. A. J., Selwyn College, Cambridge.

BRITISH GLACIOLOGICAL SOCIETY  
c/o Scott Polar Research Institute, Lensfield Road, Cambridge

*President and Honorary Editor of the Journal of Glaciology* G. SELIGMAN

*Secretary:* MRS. H. RICHARDSON

DETAILS OF MEMBERSHIP

Membership is open to all who have scientific, practical or general interest in any aspect of snow and ice study. Forms for enrolment can be obtained from the Secretary. No proposer or seconder is required. Annual subscription rates are as follows:

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	U.S. dollars:	\$6.00
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(The dollar rates include Bank conversion charges)

Further details may be found in the *Journal of Glaciology*,  
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I C E

*Editor:* MRS. H. RICHARDSON

This news bulletin is issued free to all members and subscribers of the British Glaciological Society, and is published in January and July. Contributions should be sent to Mrs. H. Richardson, c/o Scott Polar Research Institute, Lensfield Road, Cambridge, to arrive not later than the 15 November and 15 May.