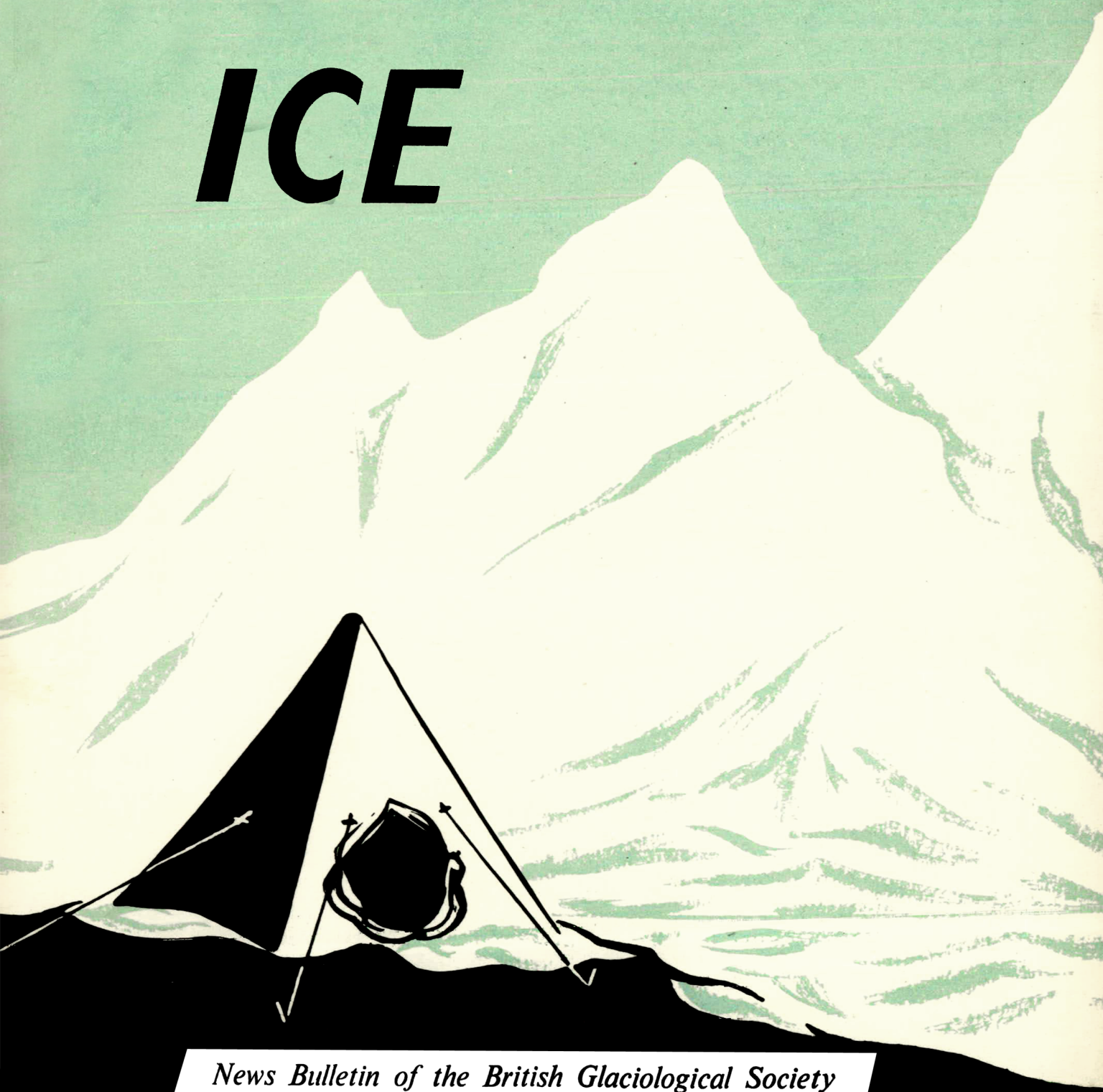


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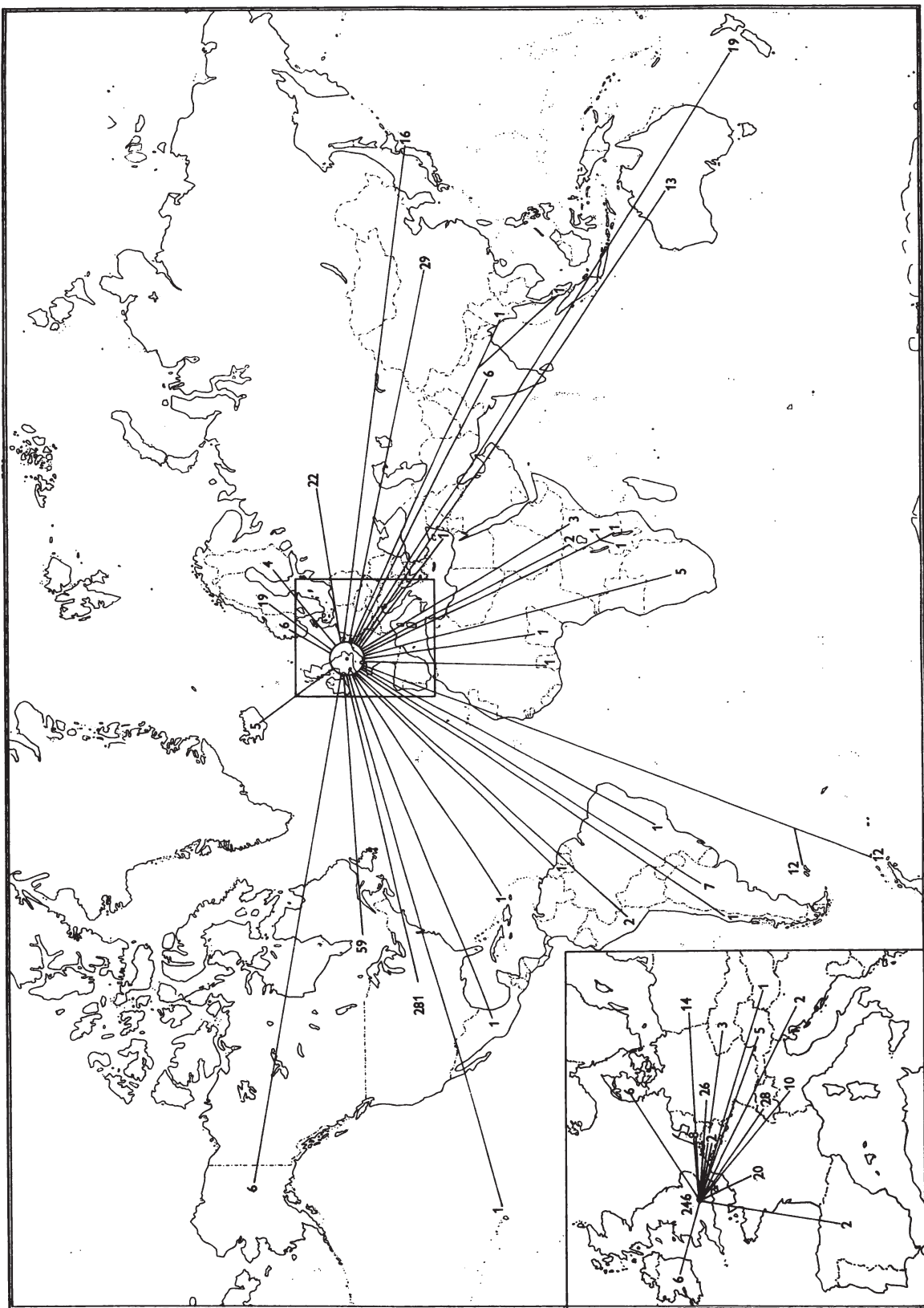
JANUARY 1958

ICE



News Bulletin of the British Glaciological Society

Distribution of the Journal of Glaciology
January 1958



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New Members	

During the twenty-one years of its existence membership of the British Glaciological Society has risen to 880 (see graph, p.12). The "Journal of Glaciology" is now sent regularly to 47 countries. This bulletin is a new venture which aims to give members information about current events of glaciological interest. It replaces "Reports to Members" and also includes items of a more ephemeral nature which formerly appeared in the "Journal of Glaciology".

The articles and news in Ice are compiled from information submitted by members themselves. The Secretary invites members to send material, c/o Scott Polar Research Institute, Lensfield Road, Cambridge; brevity is essential, and contributions should be typewritten, with maps and diagrams clearly labelled.

We wish to advise members that advertisements can now be put in the Journal of Glaciology. The Secretary will be pleased to hear from any member who has already transacted business with, or who knows of, firms that may be willing to buy advertising space. The following types of firms are suggested: manufacturers of equipment and scientific instruments in the United Kingdom, Europe or America, publishers, and shippers of exploration stores.

Contributors to the Journal of Glaciology are reminded that alterations to manuscripts at proof stage are extremely expensive and should be confined to corrections of fact only. Additions to text should be, if possible, balanced by deletions of equal length. Authors are asked to check manuscripts most carefully for accuracy of fact and meaning before submitting them to the Editor.

International Geophysical Year

The Society has been chosen as World Data Centre C for Glaciology; Centre A is in the U.S.A. and Centre B in the U.S.S.R. Copies of all observations and reports will be kept in the Society's office in the Scott Polar Research Institute at Cambridge, and will be available for inspection and for duplication.

Field Work

CAMBRIDGE AUSTERDALSBRE EXPEDITION, 1955-57.

Work has continued during 1957 on Austerdalsbre, one of the distributary glaciers from Josterdalsbre in southern Norway. In 1955 a gravity survey of the tongue was made, and a tunnel for flow measurements dug into the ice at the foot of the ice fall¹. In 1956 the main projects were the sinking of a pipe through the ice at the foot of the ice fall to measure the velocity at depth, and detailed strain measurements on a line of stakes running longitudinally down glacier in the region of the wave ogives. A Brathay Exploration Group and a Cambridge Boy Scout troop mapped the ogives down glacier, and a group from Nottingham University measured the profile of the valley beneath the glacier and of the bottom of the lake. During 1956 over 100 people worked on the glacier.

¹ Journal of Glaciology

In the winter of 1956-57 a party returned to search for the pipe. The members were: W.H. Ward, leader, J. Huseby, M.J. Prosser, R.J. White. Unfortunately the snow was too deep for the pipe to be located, but some stakes were found and surveyed.

In June 1957 W.H. Ward, leader, J.W. Glen, Cuchlaine A. King, J.F. Nye, Edith Peters and others worked on the glacier. The pipe could still not be found, because it had been buried beneath avalanche debris. A second line of stakes was inserted in the region that had been occupied by the first line in 1956, and a further line was placed along a transverse profile lower down glacier; both lines were surveyed. In August, members of the Brathay Exploration Group, under the leadership of Michael Robins and A. Brian Ware, returned to Austerdalsbre and resurveyed the stakes.

THE SEILAND ICE CAP EXPEDITION, 1956.

A party visited Seiland, an island south of Hammerfest in the fylke of Finnmark, Norway, in the summer of 1956 in order to survey the present extent of the two ice caps, Nordmandfjordjøkelen and Seilandsjøkelen. The members were: D.C. Ford, leader, surveyor and glaciologist; M.J. Bayley, B.E. Swift, B.A.G. Weston. The southern lobe of Seilandsjøkelen was surveyed, and an intensive study was made of the ice conditions and of the area left by recent retreat of the ice. The extent of the ice over the remainder of Seilandsjøkelen was mapped and the extent of the retreat since the Norwegian survey was estimated. On Nordmandfjordjøkelen a study of the present extent and state of the ice was made, but no comparison was possible with the previous survey owing to inconsistencies on the old map. A full report of the expedition has been presented to the library of the British Glaciological Society.

CAMBRIDGE SOUTH-EAST ICELAND EXPEDITION, 1957.

A party of Cambridge students worked on Svinafellsjökull, one of the distributary glaciers flowing from the south side of Vatnajökull. The programme was designed to repeat certain of the observations taken by C.A. King and J.D. Ives in 1954¹ and also to provide data for comparison with the work on Austerdalsbre reported above. Members of the expedition were: R.E. Lawrence, leader; G.R. Elliston, deputy leader; D.L. Atherton, D.E. Elliott, D.S. Shaw, J.C. Shaw, and R. Wyness.

A line of stakes was laid out at 100 ft. intervals from a point about one fifth of the way up the ice fall to a point one mile down glacier, covering all the wave ogives and the first four dirt ogives. The stake system was surveyed on four occasions at fourteen day intervals. The dirt ogives further down glacier were counted and measured. A levelling programme was carried from the terminal moraine to the topmost stake. A transverse velocity profile was measured for comparison with earlier work¹ and ablation measurements made. Meteorological observations were also made from the 10 July to the 25 August. Other glaciers in the vicinity were visited and inspected, and photographs of the ogives were taken for comparison with those on Svinafellsjökull.

OXFORD UNIVERSITY MOUNTAINEERING CLUB STORSTEIN EXPEDITION, 1957.

The O.U.M.C. Storstein Expedition visited the Storstein mountains in Arctic Norway during July and August, 1957. The expedition, led by C.J. Mortlock, consisted of six undergraduates. The aims were primarily concerned with exploratory mountaineering, but L.G. Hill and J.R.M. Setchell also carried out some glaciological work on the only true valley glacier in the mountain group.

EXPEDITION TO THE SALMON GLACIER, 1957.

In 1957, as in 1956, the National Research Council of Canada sponsored a glaciological expedition organized by the Geophysics Laboratory of the University of Toronto. The glacier studied was the Salmon Glacier, in the Coast Range of northern British Columbia. Detailed seismic and gravity measurements had been made in 1956, so the work of the 1957 expedition was confined to meteorology and photogrammetry. Professor J.A. Jacobs, University of British Columbia, organized the project, while G.D. Garland, University of Alberta, and R.R. Doell, Massachusetts Institute of Technology, directed the work in the field.

¹ Journal of Glaciology, Vol. 2, No. 18, 1955, p. 563-69 and Vol. 2, No. 19, 1956, p. 646-51.

The meteorological measurements were arranged and conducted by J. Adkins, University of Cambridge, and F. Godsell, Massachusetts Institute of Technology, in the accumulation zone near the top of the glacier. Ablation measurements were made, using bamboo stakes, at points along a line extending down glacier from the station. The period of the complete observation extended for one month, from 15 July.

The photogrammetric programme was arranged by the National Research Council under the direction of Dr T. J. Blachut. The field observations by D. Haumann included a re-triangulation of the glacier, with permanent marking of control points, and terrestrial photogrammetry of the ice surface. Control points were prominently marked to be visible on the low-level air photographs, which were taken by the British Columbia Department of Lands during August.

Other work included geomorphological studies by G. Falconer, University of Toronto, and water level recordings on two important rivers fed by water from the glacier. The Canadian artist Will Ogilvie visited the glacier and made water colour paintings and charcoal sketches. An indirect aim of the expedition was to provide training and experience in glaciology for Canadian students, and this year three from the University of Toronto joined the party. The services of R. Kellerhals of Zurich, an experienced mountaineer, were most valuable to the expedition.

"STAGE DE GLACIOLOGIE" IN THE GRANDES RUSSES, 1957.

An expedition to the glacier of Saint Sorlin (Savoie), France, was organised and led by Professor Ch. P. Péguy, University of Rennes. Preliminary work was done in the area in June, and the main party of about twenty was there from 31 July until 9 August. Other members included A. Cailleux, J. Corbel, L. Lliboutry; André, (Rabat); L. E. Hamelin, (Quebec) and Miss E. M. Shaw, (United Kingdom).

Studies on the glacier included measurement of ablation, movement of the ice and depth of the glacier, density measurements in the névé, and assessment of the albedo of the snow. The lower part of the glacier within the ablation zone was examined thoroughly. The sediments in the area newly uncovered by the retreating glacier were investigated. The party climbed the Pic de l'Etendard (3,468 m.) the highest peak in the Grandes Rousses.

CAMBRIDGE EXPEDITION TO SVARTISEN, NORWAY, 1957.

An expedition of ten members from Cambridge University, including J. C. Stokes and W. H. Theakstone, worked in the Svartisen area during the summer of 1957. A survey was made of the moraines and associated landforms at the north-western end of the Østerdalisen glacier-dammed lake. At Flåtisen, the major outlet to the central valley, Glåmdalen, a survey was made of the glacier, its moraines, and the associated lake. Ice caves and the retreat of the ice front by calving were investigated. Many limestone caves in the area were explored and surveyed.

TRANS-ANTARCTIC EXPEDITION.

A message of good wishes was sent to the Commonwealth Trans-Antarctic Expedition on behalf of the Society prior to the start of the trans-continental journey. The results of their seismological survey will be awaited with great interest owing to the recent announcements from the U.S.A. and U.S.S.R. bases that their observations had shown the ice resting on rock below present sea level at a number of points.

International Meetings

MEETING OF THE INTERNATIONAL COMMISSION ON SNOW AND ICE, TORONTO, 1957.

The eleventh General Assembly of the International Union of Geodesy and Geophysics took place in Toronto from 3 to 14 September, 1957, under the presidency of Professor K. R. Ramanathan, India. During the Assembly meetings of the Commission on Snow and Ice were held. The President of the Commission, Professor R. Haefeli, was unfortunately kept away by illness, and his place was taken by one of the Vice-Presidents, Professor R. Finsterwalder. A large number of papers were read and discussed. Two open meetings were arranged on

the I.G. Y., one of which was concerned with the rocket programme and the other with the Soviet work in the Arctic and Antarctic.

Officers for the next triennium were elected. Professor R. Finsterwalder was elected President, Professor A. Bauer and Professor U. Nakaya were elected Vice-Presidents, and P. D. Baird was re-elected Secretary. The Commission discussed the possibility of holding a symposium* on "The physics of glacier movement" at some centre in the Alps in September, 1958, and a suggestion to this effect was proposed to the International Association of Hydrology.

Professor J. Tuzo Wilson, a member of the British Glaciological Society, was elected President of the International Union of Geodesy and Geophysics. The Union accepted an invitation for the next General Assembly to be held in Helsinki in 1960.

* We have since heard that the symposium will be held from 16th to 24th September 1958 at Chamonix.

Further details can be obtained from the B.G.S. Secretary, c/o Scott Polar Research Institute, Lensfield Road, Cambridge.

The following papers were read before the Commission:

* Read by title.

† Read in absentia.

Snow

Mean duration and accumulation of snow cover in Canada	I. G. Potter (Canada)
Nouvelles recherches sur la corrélation entre les neiges et les débits des cours d'eau	D. Tonini* (Italy)
Some observations on the influence of the snow cover on heat flow from the ground in the Ottawa Area	L. W. Gold (Canada)
Snow survey in Hokkaido	A. Higashi (Japan)
The synthetic report of the recent studies on the mechanism of snow melting in Japan	C. Kojima† (Japan)
Studies of the frequency of snowfall in Great Britain (1668-1956)	G. Manley (United Kingdom)
Air permeability of snow	J. A. Bender (United States)
A survey of arctic snow cover properties as related to climate conditions	M. A. Bilello (United States)
The use of heat balance procedure to estimate runoff from small watersheds under conditions snow melt	D. F. Witherspoon* (Canada)
Snow survey by Ontario Hydro	J. A. S. Milne (Canada)
Measurement of the snow-water content with the use of radiocobalt	J. Martinec* (Czechoslovakia)
Study of snow accretion on wires	M. Shoda† (Japan)
Physical studies in Japan on the mechanical properties of deposited snow	Z. Yosida† (Japan)
The variability of the physical characteristics of snow covers across Canada	G. P. Williams (Canada)
Physical properties of the snow cover	G. K. Sulakvalidze* (U. S. S. R.)
Le changement de la densité de la neige en Hongrie	M. Keri and P. Salamin* (Hungary)
Influence of forests on accumulation and thawing of snow in dependence on meteorological conditions.	V. V. Rakhmanov † (U. S. S. R.)
Les cinquante ans d'observations à l'Eismeer par le nivomètre	P. L. Mercanton† (Switzerland)
Snow survey in Japan	K. Ishiwara * (Japan)
La teneur en eau lourde dans quelques bassins glaciaires des Alpes Suisses	A. Renaud* (Switzerland)
On metamorphism and hardening of snow under constant pressure and temperature gradient	M. de Quervain (Switzerland)

Sea Ice, Lake Ice and Ice in Soil

- | | |
|---|----------------------------------|
| Computation of freezing periods for water reservoirs and cleaning them from ice | V. Piotrovich* (U.S.S.R.) |
| Relations between the general weather situation and the occurrence of sea ice | F. Nusser* (Germany) |
| Etude sur le gel du sol | S. Hénin* (France) |
| Studies on lake ice movements | M. Sundberg-Falkenmark* (Sweden) |
| Underground fibrous ice | Dostovalov* (U.S.S.R.) |
| Curious open water features in the ice at the head of Cambridge Fiord | M. Dunbar (Canada) |

Glaciers

- | | |
|---|---|
| Les glaciers du désert chilien | L. Lliboutry, C. Gonzalez et J. Simken* (France) |
| The economy of the Hintereisferner in the years 1953-1954 | O. Schimpp † |
| L'activité du comité glaciologique et les variations des glaciers italiens en 1956 | M. Vanni † (Italy) |
| The Kutiah Glacier in the Haramosh Group (Karakorum) | A. Desio † (Italy) |
| Mesures d'ablation au Hofsjökull (Islande) 1954 | C. Peguy* (France) |
| The advance of the Nisqually Glacier on Mt. Rainier (U.S.A.) between 1952 and 1956 | W. Hoffman † (Germany) |
| Les variations des glaciers du Mont-Blanc | M. Bouveret* (France) |
| Nouvelles recherches sur le Glacier de la Marmolada | M. Tonini* (Italy) |
| The glaciological researches on the Italian expedition to the Karakoram (Himalaya) 1953-1955 | A. Desio † (Italy) |
| Glacier variation and trends in runoff in the Canadian Cordillera | E. P. Collier † (Canada) |
| Rapport général sur les variations des glaciers européens | P. Mercanton* (Switzerland) |
| Glaciological investigations in the Soviet Union | G. A. Avsyuk (U.S.S.R.) |
| Ground temperature studies, Canada | D. C. Pearce (Canada) |
| Investigations on the Grinnell and Sperry Glaciers, Glacier National Park, Montana | A. Johnson (U.S.A.) |
| Scope, state and development of precise glacier surveys on the earth | R. Finsterwalder (Germany) |
| Glaciological studies on Austerdalsbreen, Norway 1955-1957 | J. F. Nye, J. W. Glen and W. H. Ward (United Kingdom) |
| Les méthodes de sondages glaciaires | L. Reynaud* (France) |
| Radiation measurements on the Greenland Ice Cap | M. Diamond and R. W. Gerdell (United States) |
| Structural and stratigraphic studies of ice island T-3 and the Ellesmere ice shelf | E. W. Marshall* (United States) |
| Vertical distribution of velocity in Salmon Glacier, B. C. | W. H. Matthews † (Canada) |
| Geophysical studies on the Salmon Glacier | J. A. Jacobs and R. R. Doell (Canada and United States) |
| The main problems of modern glaciology in the light of investigations by Soviet scientists | P. A. Shumskiy* (U.S.S.R.) |
| On the deformations and excavations in the Greenland névé | J. K. Landauer (United States) |
| Mesure des pressions et des déformations dans des galeries de glace | R. Haefeli † (Switzerland) |
| The mechanics of crevasse formation | M. F. Meier (United States) |
| Reiteration-explorations of seismic reflection at the Pasterze Glacier and its importance for identification of variations of glaciers and inland ice | B. Brockamp (Germany) |

Phenomena associated with the deformation of a glacier bore-hole	M. M. Miller (United States)
New knowledge about the block-movement of glaciers	W. Pillewizer† (Germany)
Seismic research on the Gurgl Glacier	O. Förtsch and H. Vidal†
H_2O^{18}/H_2O^{16} ratio in glacier ice	S. Epstein (United States)
Summary of glacio-meteorological investigations in the Karakoram	N. Untersteiner † (Austria)
Mesures du micro-écoulement de quelques glaciers des Alpes Orientales	G. Linding* (Germany)
Le bilan de l'Inlandsis du Groenland	A. Bauer* (France)
Rapport d'activité de la Sous-Commission: Expedition Glaciologique Internationale au Groenland (E. G. I. G.)	A. Bauer* (France)
Le micromouvement des glaciers	A. Bauer* (France)
Various	
Glacial map of Canada	G. Falconer, W. H. Matthews, V. K. Prest and J. T. Wilson (Canada)
Drainage area as a hydrologic factor on the glaciated Canadian Prairies	W. Stichling and S. R. Blackwell* (Canada)
Geocryology and its main problems in the U. S. S. R.	P. F. Shvetsov* (U. S. S. R.)
Glaciation of the Torgat Mountains, Labrador	J. D. Ives † (Canada)
Snow and avalanche classification	M. de Quervain (Switzerland)
Effect of hydrostatic pressure on the velocity of shear deformation of single ice crystals.	G. Rigsby (United States)

THE INTERNATIONAL ASSOCIATION FOR QUATERNARY RESEARCH (INQUA)

The fifth international congress of the Association for Quaternary Research was held in Spain during August and September, 1957. Forty-two countries were represented. The congress, under the presidency of Professor G. A. Blanc, Rome, was held for seven days in Madrid and five days in Barcelona. Well organised excursions, for which special guide books were provided, formed a most valuable part of the congress. The books which are of particular interest to glaciologists are those on the Pyrenees (N. 1), Gredos (C. 1), and Guadarrama (C. 3 - C. 4). Excellent examples of Riss and Würmian moraines were studied in the Aragonese valleys and in Senabris (Léon).

During the two sessions of the conference over 200 papers were read, grouped under eleven sections, of which one was glaciology. There were three themes of general interest - regional Quaternary and stratigraphical correlations, paleoclimatology, and chronology. A useful report, "Subdivisions of the Pleistocene", was presented by the Commission on Nomenclature and Correlation of the Pleistocene; this was based on a questionnaire answered by representatives of twenty-one countries. There were several papers on glaciology on regions from Patagonia to Greenland. The publications of the congress and the transactions in due course will be obtainable from the General Secretariat, c/o Instituto Geológico, Universidad, Barcelona.

Members' News

H. Bader has been appointed a member of the Technical Panel on Glaciology for the United States National Committee for I. G. Y.

G. C. L. Bertram has been awarded the Murchison Grant of the Royal Geographical Society for services to Polar research and exploration.

F. P. Bowden has been elected to a professorial fellowship at Gonville and Caius College, Cambridge.

Professor Ardito Desio has been awarded the Patron's Medal of the Royal Geographical Society for geographical exploration and surveys in the Himalayas.

Professor R. P. Goldthwait has received a Fulbright Award to do glaciological research in the New Zealand Alps.

R. A. Hamilton has been made a Fellow of the Royal Society of Edinburgh.

H. J. Harrington is the leader of a party of eight who are making the first full-scale geological survey of the northern part of Ross Dependency, based at the joint New Zealand - U. S. A. I. G. Y. station at Cape Hallett.

J. D. Ives has been appointed Director of the McGill University Sub-Arctic Laboratory at Schefferville.

P. Kasser made a photogrammetric study of the basin of the Aletsch Glacier during September, 1957.

W. Kick is endeavouring to trace a painting made in 1861 of the Chogo Lungma Glacier, in the Karakorum, by Colonel H. H. Godwin Austen, in order to compare the then position of the glacier end with its present position. Any information will be welcomed.

J. L. Lorenzo is working in the Mexican I. G. Y. glaciological group.

Troy L. Péwé studied the movements of the Muldrow Glacier, in McKinley National Park, Alaska, during the summer of 1957. This glacier, after 100 years of quiescence, began moving in the spring. By 27 July the tongue of ice had advanced at least 3.8 miles from its position in the autumn of 1956. No nearby glaciers show similar activity.

G. de Q. Robin has been appointed Director of the Scott Polar Research Institute, Cambridge, and T. E. Armstrong an Assistant Director of Research (Polar research).

Reviews

DAS PROBLEM DER GLIEDERUNG DES EISZEITALTERS IN PHYSICH-GEOGRAPHISCHER SICHT (The problem of the systemization of the Ice Age from the physical-geographical aspect). CARL RATHJENS. Münchner Geographische Hefte, Ht. 6, p. 1-68, 1954, 11 text figures.

This paper is a critical discussion of Quaternary stratigraphy, with short lists of the more important newer publications. Emphasis is laid on climatic variations, on the successions in the Alps, North Europe and North America, and on the displacement of climatic zones. In the author's opinion, our present knowledge is too uncertain to distinguish between interglacial and interstadial in the earlier part of the Quaternary, or to correlate successions with sea-levels and with the records obtained from cores in the ocean floor, or to justify belief in the theories applied to this. Nevertheless, he himself is ready to propound a considerable number of conclusions.

The map of the late glacial stages in the North Alpine Foreland is useful, as is also the diagram illustrating three interpretations of the oscillations of the Mediterranean sea-level during the last glaciation.

J. K. C.

SNOW COVER AND CLIMATE IN THE SIERRA NEVADA, CALIFORNIA. DAVID H. MILLER. University of California, Publications in Geography, Vol. 11, Ed. J. B. Leighly and others. Berkeley and Los Angeles, University of California Press, 1955. 218 pages, 11 text figures.

The comparatively young science of meteorology is still under the disadvantage of retaining in its textbooks a number of partial fallacies which have been handed down uncritically through several generations. According to classical theory, a layer of snow serves to intensify the cold of the overlying air at night and to prevent much accession of warmth thereto by day. In this work the author deals with a mountain region whose thermal climate departs widely from the traditional characteristics. Though harbouring an annual snowpack with a mean aggregate depth of 11m. per season, the central Sierra Nevada is famed for the mildness of its winters. The warmth is not an import but a local product resulting from a complex of factors. These comprise frequent subsidence of air under anticyclonic streamlines aloft, abnormally low albedo of the repeatedly thawing snow surface, and the absorption and transfer of strong insolation by extensive conifer forests.

David H. Miller's detailed discussion and able explanation of a regime conflicting with accepted theory forms an important contribution to both climatology and the physics of snow cover.

ARCTIC CANADA FROM THE AIR. MOIRA DUNBAR AND KEITH R. GREENAWAY. Defence Research Board, Canada, 1956. 541 pages, 50 maps, 2 graphs, 504 air photographs.

This book, covering Canada north of the tree line, was written at the request of the Royal Canadian Air Force and replaces "An aerial reconnaissance of Arctic North America" by Flt. Lt. K. R. Greenaway and Lt. S. E. Colthorpe, U.S.A.F., published in 1948 by the Joint Intelligence Bureau, Canada. Since the earlier work appeared, complete air photographic coverage of the Canadian Arctic has become available, and many of the formerly inaccurate maps have been revised. This book is intended as an aid to airmen map reading from the air and as a source of general information for geographers and others.

Most of each chapter is devoted to the topography of a single area preceded by a brief history of exploration, population and settlement, and each has a map. Each island has been divided into physiographic regions, some for the first time. More than 500 excellent oblique air photographs have been chosen with great care. The last four chapters deal with the bodies of water separating the various land areas, the Arctic Ocean, weather and arctic aviation. Appendices give a list, in chronological order, of the principal expeditions to the Canadian Arctic up to 1936, and a glossary of about 100 geographical and ice terms.

This is an admirable compilation of a great many facts by two authors who have both had a great deal of flying experience in the area.

IM EIS VERGRABEN: ERLEBNISSE AUF STATION "EISMETTE" DER LETZTEN GRÖNLAND-EXPEDITION ALFRED WEGENER'S 1930/31. J. GEORGI. F. A. Brockhaus Verlag, Leipzig, 1955. 355p., illus., diagrams and map.

The major portion of this book consists of the diary written for his wife by the author when, with F. Loewe and E. Sorge, he sheltered in appalling conditions, in a hole within the neve 10,000 ft. high in the centre of Greenland. This was at "Station Eismette", where the temperature was as low as -85°F. (-65°C.). The report, first written 25 years ago, shows the modern explorer how the earlier ones lived, worked and travelled in what the author calls "the end of the epoch of rather primitive classical research".

SCHNEE UND LAWINEN IN DEN SCHWEIZER ALPEN. Davos-Platz. Buchdruckerei, Davos AG.

This review deals with two issues of this excellent report of the work of the Federal

Institute for Snow and Avalanche Research at Davos, namely, those for the years 1953/54 and 1954/55.

Commencing with introductions by the Director, Dr. M. de Quervain, each issue continues with chapters on the weather and snow conditions obtaining during the winter, accidents to people and stock, damage to property and forests, and the course of the snow and avalanche research carried out by the Institute.

The importance of these publications and the need for continuing research in a country like Switzerland can be understood when it is realised that between 1940 and 1955 there were 2351 cases of damage to property, 394 people were killed and 223 injured by avalanches.

It is a little sad to note that the details in the table from which these figures are culled do not show any reduction in recent years, although it is obvious that they depend on the weather conditions in each year. It may well be that of recent years these conditions may have become more unfavourable and winter traffic more considerable. Data showing or disproving this would be valuable.

G.S.

THE UNITED KINGDOM CONTRIBUTION TO THE INTERNATIONAL GEOPHYSICAL YEAR, 1957-58. London, The Royal Society, 72 p., 1957.

This small book describes the programme of work to be carried out at the United Kingdom stations. The accounts of the various disciplines include tables of the stations and their positions are shown in the maps on p.63-65. This book includes a chapter on the establishment of the Royal Society Antarctic Station at Halley Bay and a section on the glaciological programme.

ZIMNÍ NEBEZPEČÍ V HORÁCH (The winter danger in mountains). IGOR HOUDEK AND MILOŠ VRBA. Prague, Statní Televýchové Nakladatelství, 1956. 200 p., 33 plates.

This is the second edition of the book and includes the latest research in Czechoslovakia into the physical properties of snow and the mechanics of avalanches. There is valuable information regarding mountain dangers in winter sports and an instructive survey for making short term weather forecasts. The book is designed for all who go to the mountains, but the most interesting aspect to us is the evidence it gives of the spread of snow research beyond the countries which originally pioneered it.

DIE EISVERHÄLTNISSE DER KÜSTENGEWÄSSER VON MECKLENBURG-VORPOMMERN. JOACHIM BLUTHGEN. (Forschung zue deutschen Landeskunde Bd.85) Remagen: Bundesanstalt für Landeskunde, 1954. (9 x 6½ inches;) 142 pages text; 28 photographs; 33 tables; 55 maps. 36 figures. 14.50 DM.

The purpose of this work is to record the ice conditions of the coastal waters of Mecklenburg. The observations of the former German Naval Observatory (Deutsche Seewarte) and, latterly, the Ice Service of the Observatorium Greifswald in Mecklenburg, have provided the data. This book connects with work done by the author further east in 1936 and 1938.

There is a section on the climatological and oceanographical features of the area - wind, temperature and drift - combined with coastal topography. The shallow sea in many places near the coast results in heavy ice development. Excellent weather maps make the synoptic conditions of individual phases of ice formation very clear. The duration and conditions of the sea ice cover in a large number of coastal stations and the numbers of "ice-days" are the most important part of the work.

ZEITSCHRIFT FÜR GLETSCHERKUNDE UND GLAZIALGEOLOGIE (Ed. R. von Klebelsberg), Innsbruck, Universitäts-Verlag Wagner, Bd. 3, Ht. 2, 1956, p.145-296 and Ht. 3, 1956, p.297-493.

These two numbers conclude Volume 3. As in the first number of the volume, both the longer and the shorter articles of these two issues deal almost exclusively with pure glaciology, covering a wide range of subjects, and describe principally observations made in central Europe, although the Karakoram and South America also figure.

The impression one receives is that pre-war publications of this periodical, then merely called the *Zeitschrift für Gletscherkunde*, had a good deal more material devoted to Pleistocene times and glacial geology than it has today. This could be attributed to the advances in the knowledge of, and interest in, the world's ice cover made in recent years.

Number 3 again refers to many articles in the *Journal of Glaciology* with brief abstracted notes of the contents of some of them. Unfortunately, space prevents our returning the compliment, but compliment Professor von Klebelsberg we can at the uniform and continued excellence of his work and his great services to our subject.

G. S.

NIEVES Y GLACIARES DE CHILE; FUNDAMENTOS DE GLACIOLOGIA. LUIS LLIBOUTRY. Santiago de Chile, Ediciones de la Universidad de Chile, 1956. 471 p., maps in folder at back. 27cm.

This large book is divided into two distinct halves. The first is a general introduction to glaciology, while the second gives a historical and geographical account of the ice masses of Chile. These two parts are so distinct that it is convenient to review them separately.

The first part is a general survey of the physics of ice and of its manifestation on the earth. It covers the wide field in no great detail, but it is up to date (to 1955) and authoritative - a remark that cannot be made about any similar book in a western language. It will provide a very good introduction to physical glaciology for anyone new to the subject, and will also contain much of interest for any serious glaciologist. It is a little unbalanced in that it contains the author's own discoveries in full detail, but this is probably justifiable in terms of their importance to the second part of the book.

The second section describes the glaciers of Chile as seen both from the ground and from the air, and includes many maps which are more accurate than any previously available. Two large maps of the central Andes of Chile at a scale of 1:150,000 are also included in a separate folder. There is a chapter on "The Antarctic", as is to be expected, but the one section about the political situation is remarkably non-partisan and the early history is given with reasonable accuracy, while modern history is largely ignored. The map of Antarctica omits any national boundaries.

J. W. G.

The Society's Library

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 references will be printed in the list of glaciological literature at the end of the *Journal*, and the papers will be bound in the Society's collection of glaciological papers. The Society now possesses some 57 bound volumes of these papers, together with many files of works which cannot be bound. It is hoped that members will continue to add to this valuable collection.

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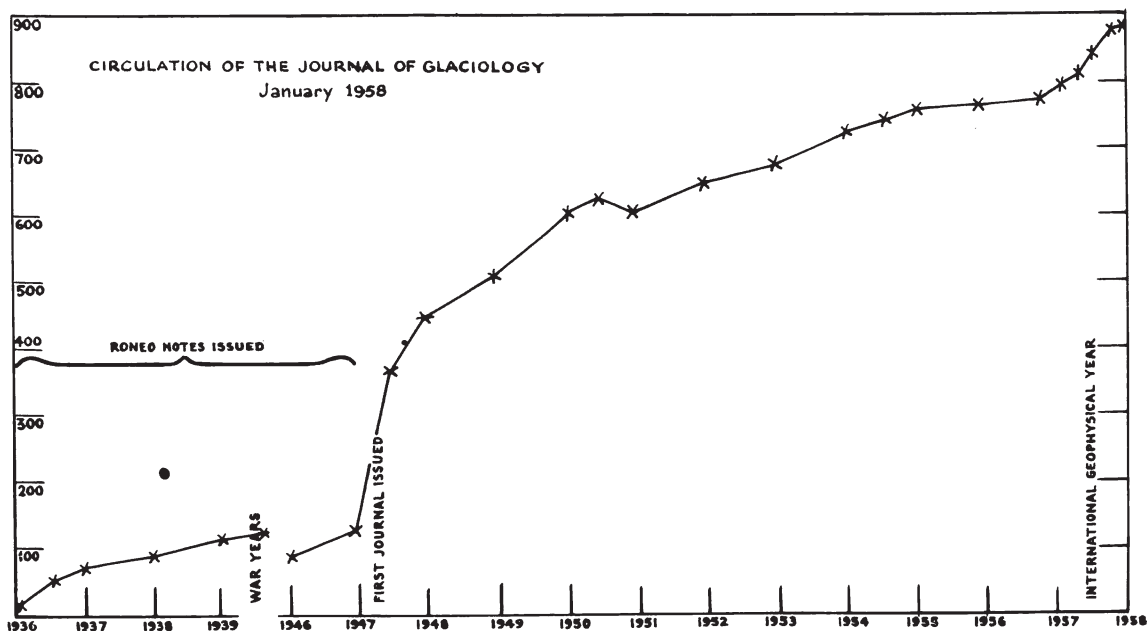
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INSTITUTE OF TECHNOLOGY UNIVERSITY OF MINNESOTA.	JORDAN, R.C. and others - Friction on snow and ice. University of Minnesota, Minneapolis, 1955.
GEOGRAPHISCHE GESELLSCHAFT WIEN.	Festschrift zur Hundertjahrfeier der Geographischen Gesellschaft in Wien, 1856 - 1956. (Ed. Konrad Wiche). Geographische Gesellschaft, Wien, 1957.
SPRINGER-VERLAG, Berlin.	EBERS, Edith - Vom grossen Eiszeitalter. Springer-Verlag, Berlin, 1957.
ROYAL SOCIETY.	The United Kingdom Contribution to the International Geophysical Year 1957-58. Royal Society, London, 1957.
DEFENCE RESEARCH BOARD CANADA	DUNBAR, M. and GREENAWAY, K. R. - Arctic Canada from the air. Defence Research Board Canada, Ottawa, 1956.
EDWARD ARNOLD (PUBLISHERS) LTD.	CHARLESWORTH, J. K. - The Quaternary Era, Vols. 1 and 2. Edward Arnold, London, 1957.

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