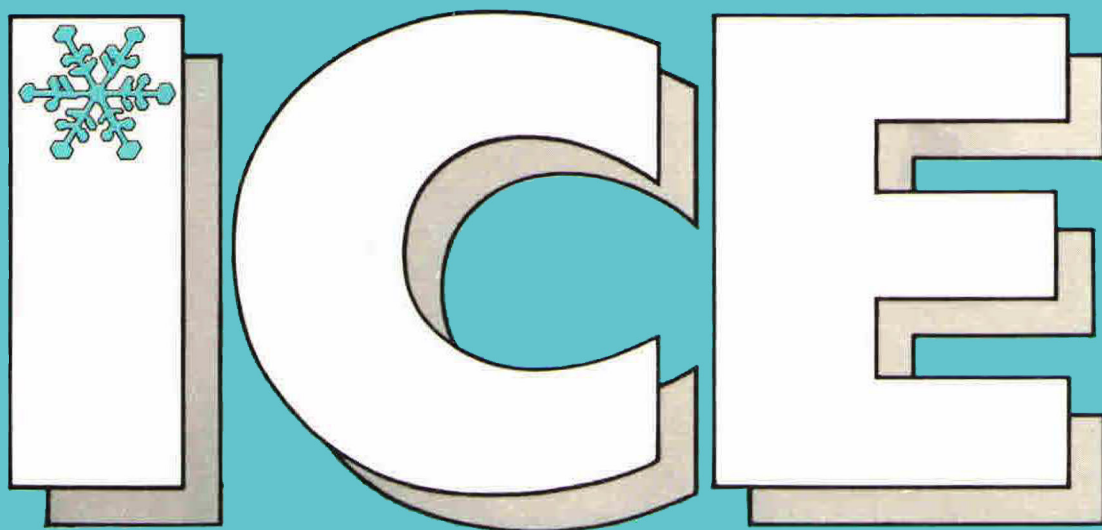


Numbers 102/103

2nd and 3rd Issues 1993



**NEWS BULLETIN
OF THE INTERNATIONAL
GLACIOLOGICAL
SOCIETY**



INTERNATIONAL GLACIOLOGICAL SOCIETY

The Society will co-sponsor the following meetings and publish the proceedings in the *Annals of Glaciology*:

1995 September

EISMINT

(European Ice Sheet
Modelling Initiative)

To be held in Strasbourg, France
by the European Science Foundation

(see p. 17 of this issue of *ICE*)

1997 August/September

**ANTARCTICA AND
GLOBAL CHANGE**

To be held in the University of Tasmania,
Hobart, Australia by the Antarctic
Co-operative Research Centre

(see p. 17 of this issue of *ICE*)

Detailed information about these meetings
will appear in future issues of *ICE*

ICE

NEWS BULLETIN OF THE
INTERNATIONAL GLACIOLOGICAL SOCIETY

Numbers 102/103

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SELIGMAN CRYSTAL AWARD

Rovaniemi, Finland 20 April 1993

The Society's Council agreed unanimously in 1992 that a Seligman Crystal was to be awarded to Louis Lliboutry in recognition of his outstanding contributions to scientific glaciology and in particular to glacier sliding.

The Crystal was presented by the President of the Society, Garry Clarke, who said in his introduction:

The International Glaciological Society was founded in 1936 by Gerald Seligman who served as the Society's President from the time of its inception until 1963. To recognize Seligman's contributions to the scientific study of snow and his contributions to the Glaciological Society, the Seligman Crystal was conceived and Seligman, himself, was its first recipient. The Crystal represents the highest honour of the Society and, to date, only 18 have been awarded.

This evening we honour Louis Lliboutry — one of the outstanding contributors to scientific glaciology in this century. Born in Madrid, the Spanish Civil War obliged him to complete his secondary education in France. His aptitude for science eventually led him to Grenoble where he undertook doctoral research on the physics of magnetization under the direction of the great physicist Louis Néel. Néel would later receive the Nobel Prize for his research on magnetism and is today remembered by earth scientists for his fundamental contributions to our understanding of paleomagnetism. The inspiration of such a towering intellect so close at hand would surely challenge the mind of any doctoral student. At the same time, Lliboutry could not fail to contemplate the towering topography that lay within such easy reach of Grenoble and he devoted his spare hours to the physical and intellectual stimulations of the mountains.

Upon completing his doctorate and as if to fulfill, by a single action, the promise of his youthful years in Spain, his high achievement in physics and his fascination with mountains, Lliboutry accepted an academic position in Santiago, Chile where he launched what was to become his life project: the scientific study of glaciers. In a career as long and productive as that of Louis Lliboutry it would be frivolous to attempt to identify an *annus mirabilis*, but I think that one can point to a year that was surely pivotal — a year that would set the course for his subsequent scientific accomplishments. That year would be roughly 1952. In the previous year Lliboutry published (in French) a paper on the effects of stress on magnetization; in 1952 he published (in Spanish) his first glaciological work, a paper on glacier terminus oscillations in Patagonia; in the following year he published (in English) a second paper on a similar topic. This latter paper was Lliboutry's first in English and his first in the *Journal of Glaciology*.

Lliboutry's great contributions to scientific glaciology were to follow. In 1964 and 1965 he published the first and second volumes of his monumental *Traité de Glaciologie*. This massive treatise gives a comprehensive summary of glaciological knowledge up to the mid 1960s and is still regarded as an essential reference work by students and researchers alike.

If one were to name a single scientific theme that is most commonly linked to Lliboutry, it would surely be glacier sliding. His 1968 paper entitled "General theory of subglacial cavitation and sliding of temperate glaciers" is a classic and introduced readers of the *Journal of Glaciology* to Lliboutry's personal vision of the important physical processes that govern sliding. Lliboutry's theory was roughly contemporaneous with theories developed by Weertman and Nye but differed substantially from these in its emphasis. Lliboutry recognized cavitation as an essential sliding mechanism, introduced the important concept of "effective pressure" to glaciologists, and insisted that subglacial water pressure was an independent, rather than dependent, variable. These were controversial ideas at the time but now, with the wisdom of 25 years of hindsight, we can recognize the grandeur and accuracy of his vision.

In addition to his contributions to scientific knowledge, Professor Lliboutry has made significant contributions to the organization and leadership of science both in France and internationally. As the founder and long-term Director of the Laboratoire de Glaciologie, Lliboutry developed an outstanding research group at Grenoble. From 1976–78 he served as President of the European Geophysical Society and from 1983–87 he was President of ICSI, the International Commission for Snow and Ice.

In the past decade, Lliboutry has turned his energies to the completion of major books. Two of these, *Tectono-physique et géodynamique* and *Very slow flow of solids*, cast his glaciological research in a larger context — that of "geodynamics", the scientific study of the slow viscous motions that underlie both glaciological and geological processes.

Louis, we stand in awe of your scientific accomplishments. It gives me great pleasure to present you with the Seligman Crystal.

After the presentation of the crystal, Louis Lliboutry made the following reply:

"The phone call from Japan from Hilda and Garry announcing that I was awarded the Seligman Crystal was quite a surprise. I am too frank to say that I consider myself as unworthy of it. People agree that I have revived glaciology in France. Nevertheless my friends Haefeli, Nakaya or Shumsky, who have done the same in their own countries, died before the Seligman Crystal was inaugurated. How could a mediterranean man, who dislikes tea, whisky, coke and hot-dogs, who prefers coffee, wine, olive oil and garlic, obtain this prestigious award? The more so as, for most readers of the *Journal of Glaciology*, I am the man who has challenged widely accepted theories from Weertman, Nye and Röthlisberger, so trying to prevent the setting up of reassuring paradigms. From now on, nobody will be in doubt that the Glaciological Society is truly open-minded!

This very enjoyable ceremony is traditionally an occasion for the awarded scientist to sum up his scientific life and achievements, enlivening it with some anecdotes, in a very quick skimming through.

All my ancestors are from French Catalonia, as the spelling of my name indicates. (I presume that it comes from Latin "liber olterinus", meaning "free market gardener".) Nevertheless I was born in Madrid and lived there until the beginning of the Civil War in 1936, when I was fourteen. Therefore I speak Spanish as fluently as French. In 1940 I was successful at the very competitive examination to enter Ecole Normale Supérieure, in Paris. I learnt physics and mathematics there, during the German occupation. A serious illness and an accommodating medical certificate allowed me to study, instead of taking to the bush to avoid hard labour in Germany.

The syllabus was rather obsolete. I have spent my life learning and retraining myself in new basic sciences, to the point of being able to teach them, and even to write a textbook! Science progresses not only because new results pile up. The main factor is either the entry of young people with updated training, or the retraining of older individuals.

I prepared my Ph.D. at Grenoble from 1945 to 1950, with Louis Néel as supervisor. During these years he was setting up the theories for which he received his Nobel prize in physics many years later. My thesis was on piezomagnetism of soft iron. With cheap instrumentation I found quite a lot of new facts, because the subject was almost virgin, and next Néel explained them theoretically, with plain classical physics. Our asset was that in those days a professor was totally free to choose the topic in fundamental science that seemed to him the most promising. Today, science managers, national or international commissions, and so-called democratic dialogue fix most of the topics to be investigated. Of course, such selected topics are already in fashion, and investigated by many hundreds of people.

During these five years, I was on the mountains every weekend of the year (spending August by the beach, however): down-hill skiing, spring ascents with skis and seal skins (e.g. twice to Mont Blanc), technical climbing in summer and autumn (e.g. Aiguille Verte by the Whymper couloir, Aiguille du Chardonnet by the Forbes ice ridge). Therefore, I had a fair knowledge of Alpine snows and glaciers before being a glaciologist. My main interest in glaciology came from discovering that the snows and glaciers in the Andes of central Chile are quite different.

I left Néel's lab. for three reasons. First, my salary was incredibly low. Second, after the World War young people were anxious to travel abroad. Third, I was inclined to theory and, having the same education as Néel, I was unable to develop his theories further. I took a position of visiting professor at the University of Chile, in Santiago, for three years. The study of the Andes was so exciting, and life so pleasant there that, after long holidays in France to marry my fiancée Claude, I came back for two years more, with her this time.

During the austral summer 1951/52 I went as scientific member with a French expedition that conquered the Fitz-Roy (Patagonia). Before starting I asked for instructions from the only glaciologist I knew: my rope mate at Aiguille Verte, Martin Brunt, who was helping Ben Battle to study bergschrunds. He advised me to subscribe to the British *Journal of Glaciology*. Then Gerald Seligman, Editor of the *Journal*, wrote: "Nothing is known about Patagonian glaciers; all observations will be fine". Two weeks after our wedding we were invited to his nice house

in Kent, and I lectured to the British Glaciological Society in my very poor English.

In the 1952 issues of the *Journal* the only important papers were Robin's one on temperatures in ice sheets, and another by Baird about superimposed ice on the Barnes Ice Cap (Baffin Island). I noticed at once that the glaciers near Santiago were fed in the same way. I studied these rock glaciers, and explained the origin of penitents. Penitent formation led me to retrain in micrometeorology, and to put students on to it. Energy balances were determined by André Poggi and his collaborators until his regrettable death in 1982.

In 1956 Expéditions Polaires Françaises sent me to train for the IGY at TUTO, Greenland, including a trip on the trail to Camp Century. On this occasion I made acquaintance with Claude Lorius, Dick Cameron, André Roch, Brockcamp, Anton Weidick and many others, especially Henri Bader, the only man who taught me glaciology personally, rather than by his writings. I came back sustaining that the interesting area to study in Greenland was the edge of the ice sheet, not its interior (deep corings were not made at that time). Albert Bauer commented to me, in private: "You are right, but that is not spectacular enough".

In 1958 there was an ICSI meeting in Chamonix, my first glaciological meeting. At that time most of the glaciologists in the world took up a single lecture room, and meetings were not highly specialized as today. Steinemann spoke about water inclusions in ice. Weertman and Nye revived the theory of kinematic waves, by using Weertman's sliding law and Glen's creep law, which were just published. At once I put my oar into both new subjects. Weertman's main contribution to glaciology has been to introduce models that allow its reduction to more basic sciences, the method that distinguishes geophysics from natural sciences. Nevertheless it gave us (myself, Kamb, Budd) the bad habit of speculating next about very rough solutions of the mechanical problem so obtained. It was only 20 years later, after considerable retraining in non-linear continuum mechanics, that I could write quite sound solutions.

This year 1958 the French administration for scientific research (CNRS) assigned me the direction of one of its laboratories, Laboratoire de l'Aiguille du Midi. Its only possession was a hut at 3600 m, one hour's walk from the cable car terminal. (Its former investigators, who studied cosmic rays there, had gone to CERN.) It took me 25 years of continuous fight to transform this empty shell into an institute of glaciology and environmental geophysics, with a staff of 60 people, and over all with an appropriate building on the university campus at Grenoble.

Most of our extensive field work in the French Alps, and of my concomitant theories, together with some studies in Cordillera Blanca, Peru, have been published in the *Journal of Glaciology*, in the *Zeitschrift für Gletscherkunde*, or in ICSI publications. Therefore, I shall not speak about them here. Let me mention only my most productive collaborators in glacier studies: François Gillet, Serge Gluck, Didier Hantz, Serge Martin, Louis Reynaud and Michel Vallon. Today the laboratory has shifted towards palaeoclimatology, and the only investigator still dealing with Alpine glaciers and keeping our know-how is Louis Reynaud.

Also, we studied in the lab. ice flow over a bump (Roger Brepson, Jacques Meyssonier) and I put physicist Paul Duval on ice mechanics, suggesting that he examine the ice fabrics of the sample not only before but also after the test,

a point missed by Glen. Duval submitted the results of his thesis to the *Journal of Glaciology* in 1974, and the paper was published seven years later, a delay worthy of the *Guinness Book of Records*! Therefore, we had the lead by seven years over foreign investigators, who ignored Duval's French publications. They were still discussing the value of n , and confusing secondary creep, recrystallization creep, and the minimum creep rate. Also I prevented Duval from wasting his time with speculative theories about dislocations. It seemed clear to me that Weertman's were wrong, since they did not account for the crucial difference between the behaviour of a monocrystal and a polycrystal.

It is of interest for the history of the emergence of our discipline to stress that I could make glaciology respected in the French scientific community mainly because, in the early seventies, I published theoretical papers on plate tectonics. Glaciology was then held in low esteem because it was thought to be an appendix to hydrology, which I consider to be water management rather than fundamental science. Colleagues teased me for a long time, asking when we met: "well, are glaciers advancing or receding?" They knew my answer: "I don't know and I don't care twopence. We are not the storekeepers of hydrologists."

In 1969 I published a paper in the JGR suggesting that the Low Velocity Zone in the upper mantle was at melting point with liquid inclusions (as temperate ice), examining the driving mechanism, and putting forward the concept of ridge push. My paper the next year, which considered the evolution of the driving mechanism with time, was referred by well-known Elsasser, who sent his report to me: "This paper is not good, it is superior. It is by orders

of magnitude the best paper I have read ... I recommend prompt publication". My best paper was nevertheless the third one, which predicted "absolute velocities" of the plates found to be about the same that the velocities relative to the hot spot reference frame. But this time, it was extremely difficult for me to have it published: the referees and editor could not understand my demonstration!

It is probably because of my leading role, together with Xavier LePichon, Maurice Mattauer and Claude Allegre, in making plate tectonics acceptable in France that I was elected to some official positions, and became one of the founders of the European Geophysical Society.

I dropped the subject because of lack of connexion with investigators in the field bringing fresh results; and because retraining in numerical computation was necessary. As usual, the best way to learn a subject was to teach it ... My outstanding students were Catherine Ritz and Anne Letréguilly, who are modelling ice sheets.

Next I worked on transient creep, challenging the Duval-LeGac-Ashby model, and on the complete creep law of anisotropic ice (where the third invariant intervenes). I have two long papers in press in the *Journal of Glaciology*, which show that glacier sliding and glacial erosion are not withered topics.

Another paper of mine is in press in the *International Journal of Plasticity*. I feel it is important that weighty papers be published elsewhere than in our very specialized journals, for the prestige of glaciology. The more so as it is still ignored as such by the IUGG, the AGU and the EGS. Therefore, the IGS is an essential institution, to which I remain held by heart and by mind.



The President, G. K. C. Clarke, presents Louis Lliboutry with his Seligman Crystal

THE RICHARDSON MEDAL

At a banquet held on 9 September 1993 at Jesus College, Cambridge, Hilda Richardson was presented with a new IGS award, the 'Richardson Medal' (see illustration on cover) in recognition of her contributions to strengthening and internationalizing the Society and, in doing so, strengthening glaciology as a science. The medal was made possible by generous contributions from Hilda's many friends in the Society. In order to maintain secrecy, it was not practical to contact all IGS members. Any members who wish to add their contribution to those already received should send a donation to IGS Vice President Dr D.J. Drewry, British Antarctic Survey, Madingley Road, Cambridge CB3 0ET.

The hallmarked silver medal was designed by the award-winning firm Andrew Smith Graphics Inc. of Toronto, Canada and fabricated by Thomas Fattorini Ltd. of Birmingham, England. It has not yet been decided if the medal will be a one-time only award or a continuing one. This question will be addressed by the Awards Committee and IGS Council in consultation with Hilda Richardson.

The design features Austerdalsbreen, a famous Norwegian glacier, where Hilda Richardson was introduced to glaciology by Vaughan Lewis and had the opportunity to work with John Glen, John Nye and Bill Ward. This central motif is flanked to the right by a snow crystal copied from the book *Snow crystals* by Ukichiro Nakaya, the famous Japanese glaciologist and is intended to represent snow and ice science as well as internationalism. To the left is an arctic wildflower, *Rubus arcticus*. The flower is intended to represent both polar glaciology and Hilda herself. *Rubus arcticus* has a lovely flower, an edible berry and a vestigial prickle.



NEW SECRETARY GENERAL: MR C. S. L. OMMANNEY



On 1 January 1994, C. S. L. Ommanney will become the Society's new Secretary General. The Council confirmed Simon's appointment in April. He moves from Saskatoon, Canada, in the fall, and will "double up" with Hilda Richardson in December in order to learn about the job.

Many of you already know Simon because of his work for the Canadian government glaciology and hydrology divisions over the last 26 years, and his service as Canadian National Correspondent for the Commission of Snow and Ice (ICSI), the World Glacier Monitoring Service (WGMS), and IGS. He has served on many Canadian national committees as well as on the international groups already mentioned. He has organized symposia and workshops in Canada, and edited books, conference proceedings and reports.

He was born in England, where he attended school. His parents, brother and sister live in England. 1961-63 he was glaciology assistant on the McGill University Arctic Research Expedition to Axel Heiberg Island, becoming Assistant and/or Field Leader in 1964-67. From 1960-67 he studied in the Geography Department of McGill University, gaining his B.A. in 1963, and his M.Sc. in 1967. He was inspired by the enthusiastic teaching of Fritz

Müller, in a similar way that Vaughan Lewis had inspired Hilda in Cambridge.

In 1967 he took up employment with the Inland Waters Branch, Energy, Mines and Resources, in Ottawa, as Scientific Officer/Head of the Glacier Inventory Section. During the ensuing years, reorganization within the government resulted in several changes of Division and Section titles: Simon's title became Head, Perennial Snow and Ice/Glacier Section. In 1986, he was appointed Head of the Cold Regions Section of the Surface Water Division, NHRI, and moved to its new offices in Saskatoon. Further re-organization led to his appointment as Chief, Scientific Information Division, in 1988, and then finally to Head, Climate and Glaciers Project, Hydrological Sciences.

He has close connections with the IGS: he was Canadian Correspondent 1975-80, and from 1991-93; edited *ICE* 1980-86; served on the Council 1980-83; helped with the Society's 1978 Symposium in Ottawa on Dynamics of Large Ice Masses; has looked after our Canadian bank account (for Canadian members' dues) since 1982; and has attended nine of our symposia, in various parts of the world.

We welcome him to our IGS headquarters team.

IGS SYMPOSIUM ON APPLIED ICE AND SNOW RESEARCH

Rovaniemi, Finland, 18–23 April 1993

60 participants gathered in the new Arctic Centre for a week of lively activity. Organization there was undertaken by the very efficient conference department, under the leadership of Raija Kivilhati. Generous hospitality was given by the Mayor of Rovaniemi and other communities and by many companies. A tour farther north into Lapland was enjoyed by 12 participants after the conclusion of the symposium.

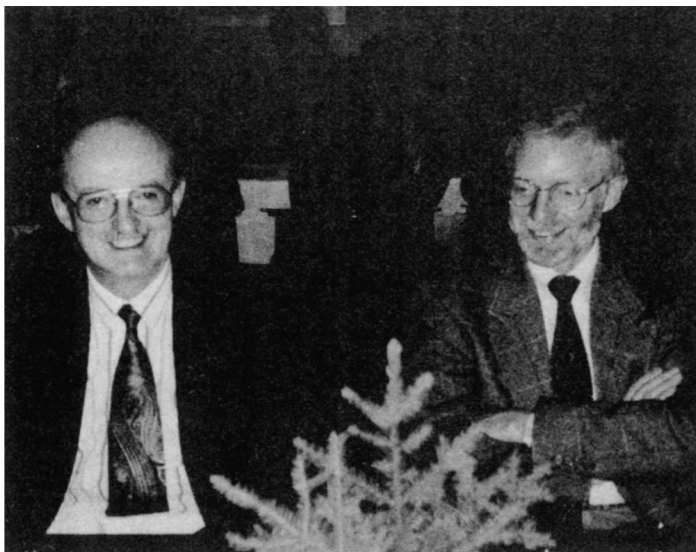
Overall planning was in the hands of Lasse Makkonen, who had worked on the event for several years, obtaining much support from government, universities, companies and cities.



Raija Kivilhati was the efficient and ever-charming organizer



T. Nakamura's daughter and youngest participant joined in with enthusiasm



S. Jones

R. Brown

All the editors worked hard, but found time to enjoy the Banquet, as you can see from the smiles of two of them

ANNUAL GENERAL MEETING 1993

MINUTES OF THE ANNUAL GENERAL MEETING OF THE INTERNATIONAL GLACIOLOGICAL SOCIETY

10 September 1993 in Cambridge, UK

The President, Dr G. K. C. Clarke, was in the Chair. 65 members from 15 countries were present.

Prior to the official business of the meeting, the President noted the recent retirement of John W. Glen, one of the Society's most distinguished members, and presented Glen with a small gift in appreciation of his many years of service as Editor of the *Journal of Glaciology* and for his outstanding scientific contributions.

1. The Minutes of the 1992 Annual General Meeting, published in *ICE* 101, p. 22–23, were approved and signed by the President.

2. The President gave his report for 1992–93:

Welcome to the Annual General Meeting of the International Glaciological Society. To date, Council has met twice: once in Rovaniemi, Finland, and once in Cambridge, England. For the Society the past year has been both challenging and rewarding. We have been aware for several years that our Secretary General would retire at the end of 1993. Searching for a qualified person to become our next Secretary General, organizing the Society's affairs so that a smooth transition can be effected and planning suitable ways to recognize Hilda Richardson's 40 years of service have been major themes. We are very pleased with the success of the Secretary-General search. Simon Ommanney, a longstanding Society member, has proven skills in the areas of conference organization, database management and desktop publishing, as well as credibility as a scientific professional.

Thanks to impressive contributions from David Collins, Liz Morris, Eric Wolfe and Anne Hall, the Soirée Richardson and subsequent banquet were a memorable success. The framed illustration and hallmarked silver medal presented to Hilda Richardson were financed by generous individual contributions from her many friends in the Society; no IGS general funds were used for this purpose. The medal was presented at the Soirée banquet and is a new Society award.

IGS is a co-sponsor of the Fifth International Symposium on Antarctic Glaciology (VISAG) currently being held in Cambridge and will publish the conference proceedings as a special volume of the *Annals of Glaciology*. Overlapping with VISAG is the IGS International Workshop on Glacier Hydrology. This workshop is an experiment by the Society in organizing a small-scale topical meeting without the organizational complexities of long lead-time of our international symposia.

The new page charge policy for the *Journal of Glaciology* is yielding the expected benefits: all manuscripts, paid or unpaid, are flowing more rapidly than they would have under the old system. As a result the publication backlog is being reduced and for 1993 the total number of printed pages will increase by roughly 50%. Council concurs with the criticisms that we have received concerning the unacceptably long time between submission and publication of manuscripts. It also accepts that the situation is especially aggravating in view of the high page charges that we have in effect. Unfortunately, we cannot contemplate lowering the page charges until the

backlog has been eliminated. To attack and eliminate the backlog, Council has approved the following: (1) The Society commits itself to eliminating the backlog and reducing the interval between submission and publication of manuscripts to 11 months. This target applies to manuscripts that do not suffer unusual delays because of scientific or editorial criticisms of author-attributed delays. (2) The target for achieving this objective is the publication date of the second *Journal of Glaciology* issue published in 1994, i.e. Vol. 40, No. 135. (3) The Society will commit up to £5000 of general funds toward solving the immediate backlog problem. Specific actions will be decided by the Publications Manager in consultation with the President, Secretary General and Treasurer and might include the acquisition of additional desktop publishing hardware and software, hiring temporary staff and subsidizing unpaid manuscripts. (4) The Society will introduce a shadow-staffing policy to minimize the impact of staff illness or holidays on *Journal* production. Where necessary we shall seek and train alternates to our present production staff in order to minimize the impact of staff illness, holidays and work overload. This policy will be fully implemented by the end of 1993. These policies and objectives have been reached in consultation with the IGS Publications Manager, David Rootes, and the Chief Scientific Editor.

The Society will organize the International Symposium on the Role of the Cryosphere in Global Change at Columbus, Ohio from 7–12 August 1994 and in 1995 will organize the International Symposium on Glacier Erosion and Sedimentation at Reykjavik, Iceland from 20–25 August.

This is my final meeting as President and I wish to extend my special thanks to Sam Colbeck, David Drewry and Bjorn Wold for their support and advice. I count myself fortunate to have been one of 'Hilda's Presidents' and also wish to thank David Rootes, Sally Stonehouse, Linda Gorman, Ray Adie, Sylva Gethin and Brenda Varney for their magnificent contributions at IGS Headquarters. Finally, the Society is made strong by the many who serve it through Council membership, committee work, reviewing and scientific editing, conference organization and other tasks. Thank you all.

3. The Treasurer, Dr J. A. Heap, submitted a report. The audited Financial Statements for the year ended 31 December 1992 show that the year closed with a surplus of £2204, and that both the Contingencies and Accumulated Funds increased. Thus 1992 was a rather healthier year than 1991 which closed with a deficit of £3949. Amongst the more important factors leading to this situation were the rise in income (including donations received as a result of the President's appeal) and the maintenance of expenditure at a level only £459 higher than in 1991.

At its meeting in 1993, Council approved the new page charge policy and increases in Membership and Library dues. Because Council had also decided that the average time from first submission of a paper to its publication should be less than eleven months, expenditures to achieve this target were agreed.

Continuation of present trends towards slowly declin-

ing income from Members and Libraries and increasing page-charge income from some countries but not others, is not in the long-term interests of the Society. I therefore make two pleas:

(a) that Members should do all they can to encourage new members to join the Society and to ensure that library subscriptions are, at least, maintained; and

(b) that Members in countries where page charges are not the norm should encourage funding authorities to support publication of the results of research work.

4. Election of auditors for the 1993 accounts.

J. W. Glen proposed and J. F. Nye seconded that Messrs Peters, Elworthy and Moore of Cambridge be elected auditors for the 1993 accounts. This was carried unanimously.

5. Election to the Council 1993–96. After circulation to all members of the Society of the Council's suggested list of nominees, no further nominations were received, and the following people were therefore elected unanimously.

President	B. Wold
Vice Presidents	D. J. Drewry C. F. Raymond
Elective Members:	R. Alley R. Bindschadler E. Brun J. Dowdeswell

The President thanked those members who had served on the Council 1990–93 and were now retiring.

After the conclusion of the formal business of the meeting, the new President, Bjorn Wold, addressed the meeting. He expressed appreciation of the confidence members had placed in him in electing him to the Presidency and his hope that he would be a worthy successor to Garry Clarke.



SOIRÉE RICHARDSON

On 9 September 1993 at Jesus College, Cambridge, a special symposium was held to honour Hilda Richardson and celebrate her 40 years of service as Secretary General of the International Glaciological Society. The Symposium was open to all Hilda's glaciological colleagues and included many participants from the VISAG meeting and the IGS International Workshop on Glacier Hydrology. The principal organizers were David Collins and Liz Morris. The event was chaired by IGS President, Garry Clarke, and featured short talks by invited speakers and a response by Hilda Richardson. The speakers were Sir Vivian Fuchs, Dr John Heap, Dr Carl Benson, Dr Akira Higashi, Miss Thelma de

Leeuw, Dr Hans Röthlisberger, Dr Igor Zotikov, Dr Jacek Jania and Dr Mark Meier.

At the conclusion of the soirée Hilda Richardson was presented with a framed caricature of herself (see illustration) that was signed by those in attendance. The caricature was drawn by Ingrid Rice, a political cartoonist who resides in Vancouver, and shows Hilda benignly in control of a small icy world. Design elements include Street Farm (Hilda's residence at Shudy Camps), a whippet and dachshund (her pets), Newnham College (her college), a Soroptimist pin and a name tag in Japanese. Raw materials for the drawing were contributed by Dr Garry Clarke, Mr Simon Ommanney, Miss Thelma de Leeuw, Dr Martin Sharp and Miss Gabriele Reifenberg.

JOURNAL OF GLACIOLOGY

The following papers have been accepted for publication in the *Journal of Glaciology*:

- K M CUFFEY, R B ALLEY, P M GROOTES, J F BOLZAN AND S ANANDAKRISHNAN
Calibration of the $\delta^{18}\text{O}$ isotopic paleothermometer for central Greenland, using borehole temperatures
- R HERON AND M-K WOO
Decay of a high Arctic lake ice cover: observations and modelling
- A G FOUNTAIN
Borehole water-level variations and implications for the subglacial hydraulics of South Cascade Glacier, Washington State, USA
- R E GAGNON
Melt-layer thickness measurements during crushing experiments on fresh-water ice
- C J L WILSON AND Y ZHANG
Comparison between experiment and computer modeling of plane strain simple shear ice deformation
- E C KING
Observations of a rift in the Ronne Ice Shelf, Antarctica
- T R SMITH AND E M SCHULSON
Brittle compressive failure of salt-water columnar ice under biaxial loading
- N MAENO, L MÄKKÖNEN, K NISHIMURA, K KOSUGI AND T TAKAHASHI
Growth rates of icicles
- E RIGNOT AND M R DRINKWATER
Winter sea-ice mapping from multi-parameter synthetic-aperture radar data
- H EICKEN, H OERTER, H MILLER, W GRAF AND J KIPFSTUHL
Textural characteristics and impurity content of meteoric and marine ice in the Ronne Ice Shelf, Antarctica

- J S WALDER AND A FOWLER
Channelised subglacial drainage over a deformable bed
- R W GRUMBINE
The thermodynamic predictability of sea ice
- MA RIST AND S A F MURRELL
Ice triaxial deformation and fracture
- J K RIDLEY, W CUDLIP AND S W LAXON
Identification of subglacial lakes using ERS-1 radar altimeter
- M FUNK, K ECHELMMEYER AND A IKEN
Mechanisms of fast flow in Jakobshavns Isbræ, Greenland, Part II. Modeling of englacial temperatures
- S ANANDAKRISHNAN, J J FITZPATRICK, R B ALLEY, A J GOW AND D A MEESE
Shear-wave detection of asymmetric *c*-axis fabrics in the GISP2 ice core
- GELLATLY, A F, C SMIRAGLIA, J M GROVE AND R LATHAM
Recent variations of the Calderone Glacier, Abruzzi, Italy
- R J BRAITHWAITE, M LATERNER AND W T PFEFFER
Variations of near-surface firn density in the lower accumulation area of the Greenland ice sheet, Pâkisoq, West Greenland
- N R IVERSON, P JANSSON AND R L E B HOOKE
In situ measurement of the strength of deforming subglacial till
- M RAM AND M ILLING
Polar ice stratigraphy from laser-light scattering: scattering from meltwater
- M SHARP, J JOUZEL, B HUBBARD AND W LAWSON
The character, structure and origin of the basal ice layer of a surge-type glacier
- K A ECHELMMEYER, W D HARRISON, C LARSEN AND J E MITCHELL
The role of the margins in the dynamics of an active ice stream
- K SZILDER
Simulation of ice accretion on a cylinder due to freezing rain

ANNALS OF GLACIOLOGY

The following papers will be published in Volume 18, *Proceedings of the Symposium on Snow and Snow-related Problems*, held at Nagaoka, Japan, 14–18 September 1992.

- J B JAMIESON AND C D JOHNSTON
Shear frame stability parameters for large-scale avalanche forecasting
- T OHTA, T HASHIMOTO AND H ISHIBASHI
Energy budget comparison of snowmelt rates in a deciduous forest and an open site
- D J NIXON AND D M MCCLUNG
Snow avalanche runoff from two Canadian mountain ranges
- D M MCCLUNG, S KOBAYASHI AND K IZUMI
Simulation of a destructive avalanche at Maseguchi, Japan
- TAKESHI YAMAZAKI, JUNSEI KONDO, TAKASHI SAKURAOKA AND TORU NAKAMURA
A one-dimensional model of the evolution of snow-cover characteristics
- TOSHISHIGE FUJII, TORU ENDO AND TOSHIKI IMAI
Snow accretion on, and removal from, railway car bodies

- KEN-ICHORU MURAMOTO, KOHKI MATSUURA, TOSHIO HARIMAYA AND TATSUO ENDOH
A computer database for falling snowflakes
- KEN-ICHIRO MURAMOTO, KOHKI MATSUURA AND TATSUO ENDOH
Measuring sea-ice concentration and floe-size distribution by image processing
- Y DURAND, E BRUN, L MERINDOL, G GUYOMARC'H, B LESAFFRE AND E MARTIN
A meteorological estimation of relevant parameters for snow models
- TAKUO KITAHARA, MASATAKA SHIRAKASHI AND YASUHIRO KAJIO
Development of a snow-fraction meter based on the conductometric method
- NOBUO ONO AND M S KRASS
Theoretical approach describing the thermal regime of snow-covered sea ice
- ZEMPACHI WATANABE
Proposition of a net-like model of snow
- KUMIKO GOTO-AZUMA, MASAYOSHI NAKAWO, MASUJIRO SHIMIZU, NOBUHIKO AZUMA, MICHIO NAKAYAMA AND KOTARO YOKOYAMA
Temporal changes in chemical stratigraphy of snow cover
- MASAAKI ISHIZAKA
An accurate measurement of densities of snowflakes using 3-D microphotographs

- TOSHIYUKI KAWAMURA, KAY I OHSHIMA, SYUKI USHIO AND TAKATOSHI KAKIZAWA
Sea-ice growth in Ongul Strait, Antarctica
- YUSUKE FUKUSHIMA AND NORIO HAYAKAWA
Analysis of powder-snow avalanches using three-dimensional topographic data
- TATSUHIITO ITO, MASARU YAMAOKA, HISAYUKI OHURA, TAKASHI TANIGUCHI AND GOROW WAKAHAMA
Development of a meteorological forecast for snow accumulation on transmission lines
- MORIAKI TAMURA
An automatic system for controlling snow on roofs
- KATSUHISA KAWASHIMA, TOMOMI YAMADA AND GOROW WAKAHAMA
Investigations of internal structure and transformational processes from firn to ice in a perennial snow patch
- L BUISSON AND C CHARLIER
Avalanche modelling and integration of expert knowledge in the ELSA system
- MASAYOSHI NAKAWO, SHIGERU CHIBA, HIROSHI SATAKE AND SHIGERU KINOUCHI
Isotopic fractionation during grain coarsening of wet snow
- NORIO HAYAKAWA, TOSIO KOIKE AND ISAO KAMISHIMA
Feasibility study of a "snow dam" concept
- ISAO KAMIISHI, AKIMICHI IYOSHI, NORIO HAYAKAWA AND KUNIO KAWADA
Use of Gaz.ex for Japan's central mountains
- TAKAHIKO UEMATSU
Numerical study on snow transport and drift formation
- MASAYUKI MAKI, SENTO NAKAI, TSURUHEI YAGI AND HIDEOMI NAKAMURA
A case study of snowstorm gusts and blowing/drifting snow
- TAKESHI SATO, TADASHI KIMURA, TAMINOE ISHIMARU AND TOSHISUKE MARUYAMA
Field test of a new snow-particle counter (SPC) system
- MASAO HIGASHIURA, TAKESHI SATO, ATSUSHI SATO, TADASHI KIMURA, MASAYUKI MAKI, SENTO NAKAI, HIDEOMI NAKAMURA AND TSURUHEI YAGI
Areal investigation of drifting snow on Tsuraru Plain, Japan
- TATSUO SEKIGUCHI, MASANORI SUGIYAMA AND TADAHO HOYA
Geomorphological features and distribution of avalanche furrows in heavy snow regions in Japan
- M R ALBERT
Some numerical experiments on firn ventilation with heat transfer
- K NISHIMURA, N MAENO, K KAWADA AND K IZUMI
Structures of snow cloud in dry-snow avalanches
- MOTOKI NISHIMORI AND RYUICHI KAWAMURA
The relationship between seasonal snow cover in Japan and recent climatic change
- TAKUYA FUKUZAWA AND EIZI AKITAYA
Depth-hoar crystal growth in the surface layer under high temperature gradients
- SEIJI KAMIMURA AND TERUYOSHI UMEMURA
Estimation of snow damage in an urban area with heavy snowfall
- K ITAGAKI AND GE LEMIEUX
Connectivity of snow particles
- TSUTOMU NAKAMURA AND OSAMU ABE
Estimated seasonal snow cover and snowfall in Japan
- KAZUHIRO MIYAKOSHI AND SHOJI MATSUMOTO
Evaluation of the snow-removal options in an urban area based on the preferences of inhabitants
- KENJI SHINOJIMA AND HORISHI HARADA
Estimating the weight of a snow cover using only meteorological factors
- J SCHWEIZER
The influence of the layered character of snow cover on the triggering of slab avalanches
- HITOSHI SHOJI, ATAU MITANI, KOHJI HORITA AND CC LANGWAY, JR
Crystal growth rates in polar firn
- CC LANGWAY, JR, HITOSHI SHOJI, ATAU MITANI AND HB CLAUSEN
Transformation process observations of polar firn to ice
- AYAKO ABE-OUCHI AND H BLATTER
On the initiation of ice sheets
- T WEISINGER, SHINICHI TAKAMI, HIROYUKI OHNO AND KOTARO YOKOYAMA
Development of an automatic, storage precipitation gauge for improved winter precipitation measurements
- M SHIRAIISHI, M MOCHIZUKI, S SUGIHARA, Y YAMAGISHI AND F WATANABE
Snow removal and de-icing using long flexible heat pipes
- JD DENT
The dynamic friction characteristics of a rapidly sheared granular material applied to the motion of snow avalanches
- S SCHMIDT AND JD DENT
A theoretical prediction of the effects of electrostatic forces on saltating snow particles
- B SALM
Flow, flow transition and runout distances of flowing avalanches
- KAZUhide SATOW
Chemical characteristics of snow in the region along the Sea of Japan
- K FUJISAWA, R TSUNAKI AND I KAMIISHI
Estimating snow avalanche runout distances from topographic data
- HIDEKI TERADA, KAZUNORI FUJISAWA, YOSHIMITSU NAKAMURA AND NORIYUKI MINAMI
Model project for establishing an avalanche warning and evacuation system
- NATSUO NUMANO
Transformation of snow damage and its societal background in recent Japan
- YASUAKI NOHGUCHI, TAKASHI IKARASHI, OSAMU ABE AND ATSUSHI SATO
A striped pattern of snowfall and snow cover
- YASUAKI NOHGUCHI
Air-gap formation by snow melting
- HIROJI FUSHIMI
Influence of climatic warming on the amount of snow cover and water quality of Lake Biwa, Japan
- CS BENSON AND M STURM
Structure and wind transport of seasonal snow on the Arctic slope of Alaska
- B TREMPER AND R DECKER
Computer applications for avalanche forecasting in the United States
- LR MCKITTRICK AND RL BROWN
A statistical model for maximum avalanche run-out distances in southwest Montana
- GE AUSTIGUY, JR AND RL BROWN
Application of a mixture theory to stress waves in snow
- GE LISTON, RL BROWN AND JD DENT
A two-dimensional computational model of turbulent atmospheric surface flows with drifting snow
- PUNEET MAHAJAN AND RL BROWN
A microstructure-based constitutive law for snow

EE ADAMS AND ATSUSHI SATO
 Model for effective thermal conductivity of a dry
 snow cover composed of uniform ice spheres
 TOSIO KOIKE, IWAO GOTO, NORIO HAYAKAWA AND
 KAZUTO WAKATSUKI
 New methods to study snowfall using remote
 sensing
 TOSIO KOIKE AND TOMOYUKI SUHAMA
 Passive-microwave remote sensing of snow
 KATSUNORI NAGANO, KIYOSHI OCHIFUJI AND
 MAKOTO NAKAMURA
 Experiments on a snow-melting system using
 circulating low-temperature fluid

SHIGEMI HATTA, TOSIO KOIKE, MINJIAQ LU AND NORIO
 HAYAKAWA
 Snowmelt runoff analysis using estimated
 distribution of snow water equivalent
 NORIO HAYAKAWA, TERUYOSHI UMEMURA AND
 YUSUKE FUKUSHIMA
 Comparison of snow-removal technologies
 practised in the cities along the Sea of Japan
 NOBUO MIYAZAKI, TOSIYUKI HARADA,
 SIGERU KONDOU AND TATUO HASEMI
 Utilization of snow with a snow compactor
 K NISHIMURA, N MAENO, F SANDERSEN,
 K KRISTENSEN, H NOREM AND K LIED
 Observations of the dynamic structure of snow
 avalanches

INTERNATIONAL SYMPOSIUM ON THE ROLE OF THE CRYOSPHERE IN GLOBAL CHANGE

Columbus, Ohio, USA, 7-12 August 1994

CO-SPONSORED BY
 Byrd Polar Research Center and The Ohio State University

SECOND CIRCULAR

October 1993

LOCAL ARRANGMENTS COMMITTEE: K. Jezek (Chairman), L. Thompson, D. Bromwich,
 C. J. van der Veen, I. M. Whillans, E. Mosley-Thompson, J. Bolzan and L. Lay, L. Everett

INFORMATION ABOUT THE SYMPOSIUM MAY BE OBTAINED FROM:

Secretary General, International Glaciological Society, Lensfield Road,
 Cambridge CB2 1ER, UK

Tel: 0223 355974 Fax: 0223 336543
 International: Tel: +44-223 355974 Fax: +44-223 336543

 The society will hold an international symposium in 1994 on the role of the Cryosphere in Global Change. The Byrd Polar Research Center, The Ohio State University, Columbus, Ohio, USA, has invited the Society to hold the Symposium in their new Center. Registration will take place on Sunday 7 August and sessions will be from Monday 8 through Friday 12 August. There will be a half-day excursion and an optional post-symposium tour.

PARTICIPATION

This circular includes a form for registration and booking of accommodation and post-symposium tour. The form and accompanying payments should be sent in accordance with instructions given on the form before 1 May 1994. There will be a UK£20 (US\$35) surcharge for registrations received after 1 May 1994.

Participants' registration fees cover organization costs, copies of abstracts, Icebreaker, half-day tour, Banquet and a copy of the *Proceedings* volume.

Accompanying persons' registration fees include organization costs, Icebreaker, half-day tour and Banquet. There is an administration charge for participants who are not members of the IGS, AMS or AGU.

REGISTRATION FEES	UK£	US\$
Participant (IGS, AMS or AGU Member)	190	320
Participant (not a member of above)	225	380
Student	90	150
Accompanying person aged 18 or over	60	100
Surcharge for late registration (after May 1994)	20	35

Refunds on registration fees will be made on a sliding scale, according to date of receipt of notification, up to 1 August 1994. After that date it may be impossible to make any refund. See booking form for methods of making payment.

TOPICS

The following topics will be open for discussion:

1. Role of high-latitude processes in global climate models
2. Role of ice sheets and glaciers in driving and responding to global change
3. Influence of sea ice in air-sea interactions, past and present
4. Evidence for detecting and understanding global change in paleo records
5. Modern observations of glaciers, ice sheets, sea ice, seasonal snow and permafrost for understanding key processes and providing benchmarks against which change can be measured.

PAPERS

(i) SUBMISSION OF PAPERS

Participants who want to contribute to the Symposium should submit an abstract of their proposed paper in English. This abstract must contain sufficient detail to enable us to form a judgement on the scientific merit of the proposed paper, but should not exceed one page of typescript, on international size paper A4 (210 × 297 mm). **References and illustrations are not required at this stage.** Place the title and authors' names and addresses at the top of your abstract and not on a separate sheet. Send abstracts to: Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, U.K.

LAST DATE FOR RECEIPT OF ABSTRACTS: 1 FEBRUARY 1994

(ii) SELECTION OF PAPERS

Each abstract will be assessed, taking into account scientific quality and relevance to the topics of the Symposium. Authors whose abstracts are acceptable will be invited to present their contribution at the Symposium. We will write in April 1994 for the first author listed about acceptance or otherwise. Other authors will not be informed separately. Acceptance of an abstract means that the paper based on it must be submitted to the *Proceedings* volume and not to another publication. Note: **Abstracts alone will not be published in the *Proceedings* volume.**

(iii) DISTRIBUTION OF ABSTRACTS

The accepted abstracts will be provided to all registered participants. These can be collected upon registration on 7 August, or mailed to you in advance. **Please contact IGS if you wish to receive a set of abstracts in advance; if we do not hear from you, it will be in your conference pack.**

(iv) SUBMISSION OF FINAL PAPERS AND PUBLICATION

Papers presented at the Symposium will be considered for publication in the *Proceedings* volume (*Annals of Glaciology*, Vol. 21). Final typescripts of these papers should be sent to the Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, U.K. by 1 June 1994. They should be written in English and prepared in accordance with the instructions about length and style that will be sent to authors in April 1994.

The papers will be refereed according to the usual standards of the Society before being accepted for publication. Speedy publication of the proceedings will depend upon strict adherence to deadlines.

ACCOMMODATION

HOTEL

A special rate has been negotiated with a nearby hotel for the nights of Sunday 7 August through Friday 12 August. The rate per room is US\$59. Payments should be made direct to the hotel at the end of your stay. Most credit cards are accepted by the hotel. Bookings must be made with IGS. The special rate is only available to people who book with us on the registration form.

DORMITORY

Some dormitory rooms have been booked on the University north campus, within walking distance of the hotel. The rate is US\$24 per night for a single room, US\$16 per person per night in a double room. Payment should be made upon registration on Sunday 7 August, by cash, Visa or Mastercard only. Bookings via IGS only.

Please mark the appropriate box on the Registration Form included in this issue.

POST-SYMPOSIUM TOUR

We plan a rubber-raft trip down one of the rivers in West Virginia, passing through deep gorges in Appalachian coal country. The scenery is spectacular, and there will be guides. Bring water-soakable clothes. Departure on Friday, immediately after the Symposium. We will stay in hotels on Friday and Saturday nights, and arrive back in Columbus before noon on Sunday. The rafting will be on Saturday, with a barbecue dinner in the evening. Cost: US\$170 per person sharing a room, US\$200 for single occupancy. This includes all transport, 2 nights in hotels, rafting fee, all meals except dinner en route Friday evening and breakfast Saturday morning. Payment must be made upon registration on 7 August in US\$. To be sure of a place on the tour please check the box on the registration form.

INTERNATIONAL GLACIOLOGICAL SOCIETY

Booking form for Registration, Accommodation and Tour

SYMPOSIUM ON THE ROLE OF THE CRYOSPHERE IN GLOBAL CHANGE
Columbus, Ohio, USA, 7–12 August 1994

Mail to: Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, UK — to arrive by 1 May 1994. If you send it later, the registration surcharge of UK£20/US\$35 should be added for each person. All cheques, etc. should be made payable to

INTERNATIONAL GLACIOLOGICAL SOCIETY

We do not accept credit card payments

Name of participants (family name) (initials) M/F

Address

.

Accompanied by:

Name Age (if under 18):

Name Age (if under 18):

Name Age (if under 18):

REGISTRATION

The total below has been sent to:

*IGS HQ Cambridge
*IGS UK Bank Account No. 54770084
*IGS c/o S. Colbeck, Hanover, NH, USA

	UK£	US\$
Participant (IGS, AMS or AGU Member)	190	320
Participant (not a member of above)	225	380
Student	90	150
Accompanying person aged 18 or over	60	100
Surcharge for late registration (after May 1994)	20	35

Total registration fees sent: _____

ACCOMMODATION

Reservation requested for: hotel *single/*twin occupancy
 dormitory *single/*twin occupancy

TOUR

Reservation requested for: *single/*twin occupancy

*delete as appropriate

There will be a surcharge for registration received after 1 May 1994

PLEASE PAY THE BANK OR TRANSFER CHARGES YOURSELF
WE NEED THE FULL FEE FOR EACH PERSON

INTERNATIONAL GLACIOLOGICAL SOCIETY SYMPOSIUM ON GLACIAL EROSION AND SEDIMENTATION

Reykjavík, Iceland 20 – 25 August 1995

CO-SPONSORED BY

University of Iceland, Iceland Glaciological Society, National Energy Authority,
Meteorological Office, Icelandic Road Authority, National Power Company

FIRST CIRCULAR

June 1993

The Society will hold an international symposium in Reykjavík, Iceland, 20–25 August 1995, on Glacial Erosion and Sedimentation.

TOPICS: The topics include:

1. Processes and rates of glacial erosion
2. Origin, transport and rates of deposition of sediment types in glacial environments
3. Erosion and sedimentation associated with normal, fast-flowing and surging glaciers
4. Erosion and transport of sediments during catastrophic floods
5. Dynamical, hydrological, geological and engineering aspects of glacier erosion.

SESSIONS: These will be held on four full days and one half-day. An excursion will be held on one half-day. We plan to provide ample opportunity for poster displays. In the Second Circular we will ask you to indicate, when submitting your summary, if you wish to participate in the poster sessions.

PUBLICATION: The Proceedings of the Symposium will be published by the Society in the *Annals of Glaciology*. Papers will be refereed and edited according to the Society's usual standards before being accepted for publication.

ACCOMMODATION: Details will be given in the Second Circular.

POST-SYMPOSIUM TOUR: There will be a tour along the south coast of Iceland and the southern outlets of Vatnajökull. Full details will be given in the Second Circular.

FURTHER INFORMATION: You are invited to attend the symposium. Please return the attached form as soon as possible. The Second Circular will give information about accommodation, general programme, preparation of summaries and final papers. Requests for copies of the Second Circular[†] should be addressed to the Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, UK.

[†]Note: Members of the International Glaciological Society will automatically receive a copy.

SYMPOSIUM ORGANIZATION: Secretary General, I.G.S.

LOCAL ARRANGEMENTS COMMITTEE: Helgi Björnsson (Chairman), Magnús Már Magnusson, Oddur Sigurdsson, Tomas Johannesson.

INTERNATIONAL GLACIOLOGICAL SOCIETY SYMPOSIUM ON GLACIAL EROSION AND SEDIMENTATION

Family Name

First Name/s

Address
.

I hope to participate in the symposium in August 1995 []

I expect to submit a summary of a proposed paper []

I hope to join the post-symposium tour []

TO BE SENT AS SOON AS POSSIBLE TO:

Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, UK.



** IGS Symposia

* Co-sponsored by IGS

1994

8-13 February

Sea and Ice–Climate Interactions: the deep sea floor as a changing environment, San Feliu de Guixols, Spain (Josip Hendekovic, European Science Foundation, 1 quai Lezay-Marnésia, 67080 Strasbourg Cedex, France)

22-25 March

Polar Tech '94, International Conference on Development and Commercial Utilization of Technologies in Polar Regions, Luleå, Sweden (CENTEK, Lena Allheim Karbin, Luleå University of Technology, S-971 87 Luleå, Sweden)

25-29 April

XIXth European Geophysical Society General Assembly, Grenoble, France (EGS 94, C/o LGGE BP 96, 38402 St Martin d'Hères Cedex, France)

16-20 May

Third Circumpolar Symposium on Remote Sensing of Arctic Environments, Fairbanks, Alaska, U.S.A. (Kenneson Dean, Geophysical Institute, University of Alaska Fairbanks, Fairbanks, AK 99775-0800, U.S.A.)

6-17 June

An Advanced Study Institute Summer School on Physics of Ice-covered Seas, Savonlinna, Finland (Matti Leppäranta, Department of Geophysics, P.O. Box 4 (Favianinkatu 24 A), SF-00014 University of Helsinki, Finland)

3-8 July

Bi-Polar Information Initiatives: the Needs of Polar Research. 15th Polar Libraries Colloquy, Cambridge, U.K. (William Mills, Scott Polar Research Institute, Cambridge CB2 1ER, U.K.)

10-15 July

International Symposium on Spectral Sensing Research '94 (ISSR '94) San Diego, California, U.S.A. (Science and Technology Cooperation Meetings Division, Attn. ISSR '94, 101 Research Drive, Hampton, VA 23666-1340, U.S.A.)

7-12 August

** International Symposium on the Role of the Cryosphere in Global Change, Columbus, Ohio, USA (Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, U.K.)

5-9 September

International Conference on Arctic Margins, Magadan, Russia (International Conference on Arctic Margins, Geophysical Institute, University of Alaska–Fairbanks, Fairbanks AK 99775-0800, U.S.A.)

30 October–3 November

International Snow Science Workshop, Snowbird, Utah, U.S.A. (ISSW '94, P.O. Box 49, Snowbird, Utah 84092, U.S.A.)

1995

20-25 August

** International Symposium on Glacial Erosion and Sedimentation, Reykjavik, Iceland (Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, U.K.)

October

* EISMINT International Symposium on Ice-sheet Modelling Strasbourg, France (contact: C. S. M. Doake, EISMINT, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET, U.K.)





EISMINT

The European Ice Sheet Modelling Initiative (EISMINT) was launched by the General Assembly of the European Science Foundation (ESF) at Strasbourg in November 1992. Member organisations from nine countries promised financial support, providing a budget of about one million French Francs annually for three years to fund an activity which is designed to examine the critical links between global climate change and ice sheets.

The main aims of EISMINT are to improve ice sheet modelling by holding:

1. Workshops on the physical basis of modelling.
2. Workshops to initiate the standardising of datasets for modelling.
3. Workshops for comparing models and outputs.
4. A Summer School.
5. A final major conference (co-sponsor with the International Glaciological Society an international symposium on Ice-Sheet Modelling).

In addition, funds for exchange grants are available.

Final conference

The International Glaciological Society have kindly agreed to co-sponsor the final EISMINT meeting. The meeting will be held in October 1995 in Strasbourg, France and will take the form of an international symposium on ice sheet modelling open to anyone who wishes to attend. By 1995, it will have been several years since the last conference devoted to modelling was held. As well as having the normal call for papers, the meeting will also be used as a forum to present and integrate reports on the workshops and to examine the progress made during EISMINT to improve our understanding of ice sheet modelling. The proceedings will be published as an issue of the *Annals of Glaciology*.

COOPERATIVE RESEARCH CENTRE FOR THE ANTARCTIC AND SOUTHERN OCEAN ENVIRONMENT

Hobart, Tasmania is now the home of a new institute of Antarctic Research. The Cooperative Research Centre for the Antarctic and Southern Ocean Environment (Antarctic CRC) has been created at the University of Tasmania by an amalgamation of the Antarctic component of the Australian Bureau of Meteorology, the Australian Geological Survey Office and the CSIRO Division of Oceanography with the Australian Antarctic Division Glaciology Program and the research component of the University's Institute for Antarctic and Southern Ocean Studies. Additional funding from the Federal Government has enabled employment of some personnel (Budd, Warner and others) by the Antarctic CRC directly.

Federal Government funding of the Antarctic CRC is, in the first instance, for a period of 7 years, concluding in 1997. For this reason, the Antarctic CRC is keen to host an international meeting during 1997 on Antarctica and Global Change, to exhibit its achievements and to provide an opportunity for the international community to examine the centre critically. The event will link with a large multi-discipline meeting, concerned with the Southern Hemisphere, to be held by IAMAP/IAPSO/IAHS in August/September 1997.

AWARD

Gunnar Østrem from NVE, Norway, has been awarded the J. A. Wahlberg medal in Silver for his work as editor of *Geografiska Annaler Serie A*, a post he has held since 1976. The medal is awarded by the Swedish Society for Anthropology and Geography and was presented to Østrem by the King of Sweden at Stockholm Palace on 26 April 1993. Østrem was the fifteenth person to have received the medal since its foundation in 1901.

The Swedish medal complements previous Scandinavian medals from both Denmark and Norway. In 1982 the Danish Geographic Society awarded Østrem the Hans Egede medal for prominent research in

Arctic seas. The medal was presented by Queen Margrethe of Denmark. In June 1992 Østrem was presented with the King of Norway's Service Medal in Gold for his work at NVE and for his international contribution to glaciology. Østrem founded NVE's Glaciology group in 1962 and worked there almost continuously until his retirement in 1992.

PUBLICATION

Fluctuations of Glaciers 1985-90, Volume VI, published by the World Glacier Monitoring Service, can now be obtained from a number of libraries and is also on sale at a price of US\$50.00.



New members

- Osamu Abe, Shinjo Branch of Snow and Ice Studies, NIED, Tokamachi, Shinjo-shi, Yamagata 996, Japan
- Victoria Alonso, Depto. de Geologia (Estratigrafia), Arias de Velasco s/n, 33005 Oviedo, Spain
- Vladimir Y. Bardin, Antarctic Commission, Room 41, Building 2, Vavilova Street 44, Moscow 117333, Russia
- Adrian P. Bateman, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET, U.K.
- Jacqueline A. Berry, School of Earth Sciences, University of Birmingham, Edgbaston, Birmingham B15 2TT, U.K.
- Barbara Bourdelles, Laboratoire de Glaciologie et Géophysique de l'Environnement, BP 96, 54 Rue Molière, F-38402 St. Martin d'Hères Cedex, France
- Luke Copland, Selwyn College, Grange Road, Cambridge CB3 9DQ, U.K.
- Tim Cowdery, 205 West 33rd Street, Minneapolis, MN 55408-3731, U.S.A.
- Anatoliy N. Dikikh, App. 12, Building 290, Krasnoarmeyskaya Street, Beshkek 720010, Kyrgyzstan
- Andrew Evans, School of Geography, Leeds University, Leeds, U.K.
- Ralf Greve, Hagenstrasse 42, D-64297 Darmstadt, Germany
- Madeleine Griselin, GDR Arctique CNRS, 30 rue Mégevand, F-25030 Besançon Cedex, France
- Magnus T. Gudmundsson, Taeknigardur Science Institute, University of Iceland, Dunhagi 5, IS-107 Reykjavik, Iceland
- Julie S. Hall, 10 Merton Walk, Hardwick, Cambridge CB3 7XP, U.K.
- Paul H. Johnson, Department of Geography, Keele University, Keele, Staffs. ST5 5BG, U.K.
- Vladimir Konovalov, Middle Asia Hydrometeorological Research Institute, Observatorskaya, 72, Tashkent 700052, Uzbekistan
- Maxim S. Krass, Institute of Mechanics, 1 Michurinsky Prospect, Moscow 119899, Russia
- Aleksandr N. Krenke, Institute of Geography, Russian Academy of Sciences, Staromonetny per. 29, Moscow 109017, Russia
- R. M. Lang, U.S. Army CRREL, 72 Lyme Road, Hanover, NH 03755-1290, U.S.A.
- D. M. Lawler, School of Geography, University of Birmingham, Birmingham B15 2TT, U.K.
- Jennette C. de Leeuw, P.O. Box 3083, Ketchikan, AK 99901, U.S.A.
- John E. Lewis, Department of Geography, McGill University, 805 Sherbrooke Street W, Montreal, Quebec H3A 2K6, Canada
- Scott Lundstrom, U.S. Geological Survey, 101 Convention Center Drive, #860, Las Vegas, NV 89109, U.S.A.
- Thorsten Markus, Universität Bremen, FBI, 28334 Bremen, Germany
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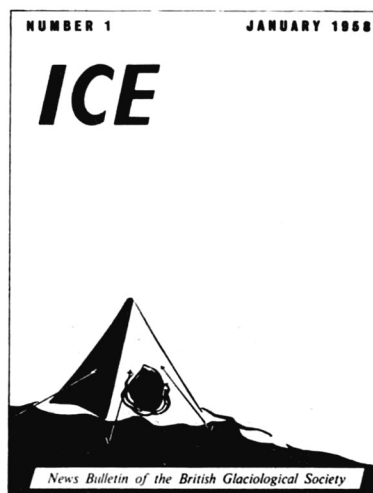


The Society has always tried to keep members informed of activities in the field of snow and ice. In the days of the British Glaciological Society (BGS), such news was provided by a small publication called "Reports to Members". At first this was duplicated, then quickly changed to a four-page printed format.

The advent of the International Geophysical Year (IGY) brought with it greater activity in glaciology. The BGS Committee recognised that reporting now required a slightly different publication. Thus *ICE* was born in 1958.

We co-operated with the IGY World Data Center A for Glaciology, run by the American Geographical Society in New York, under the leadership of W.O. Field, Jr. One result of this was the codistribution of their "Glaciological Notes" and *ICE* to those on our respective mailing lists.

Since 1953, I have had the rewarding job of providing members with news through the various transformations of *ICE*. In 1980, as part of a decision to internationalise

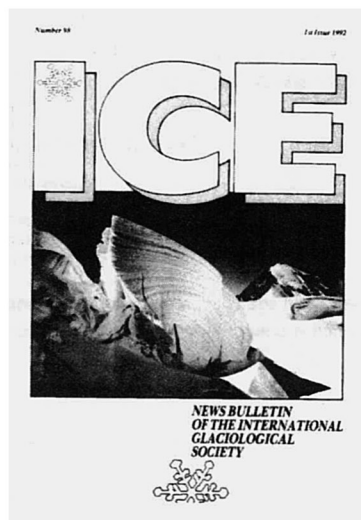
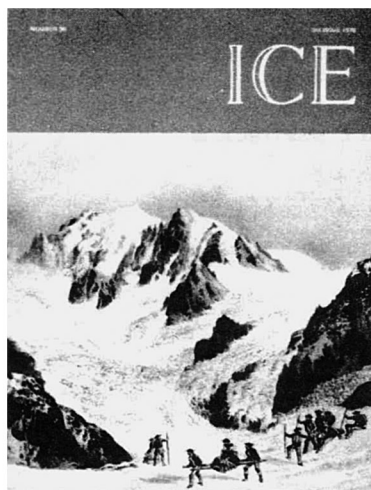


the Society operations and provide some relief for the headquarters staff, Simon Ommanney was invited to edit *ICE*. He did this for six years until his employer withdrew support. In 1986, the editing of *ICE* returned to Cambridge and to the Secretary General who was the source of much of the information published in it.

For the last forty years, I have greatly enjoyed distributing news to members and maintaining close contact with all our National Correspondents who have provided such interesting information on activities and events. My thanks go to them and to the various people in the Cambridge office who have helped with editing and production, especially Sally Stonehouse and David Rootes.

I am confident the International Glaciological Society will be well served as I hand over this responsibility to your new Secretary General, Simon Ommanney.

Hilda Richardson



L O R N E W. G O L D

The Canadian Habbakuk Project

An unusual and little-publicized project of World War 2 was an investigation into the possibility of building ships of ice. The idea which was promoted by Lord Mountbatten, Chief of Combined Operations at the time, was conceived by Dr Pyke, one of his scientific advisors. The scheme was a bold one: to construct huge unsinkable aircraft carriers in such numbers that the words 'shortage of shipping' would lose their meaning. The project was undertaken by the National Research Council of Canada.

The Canadian Habbakuk Project is the account of that scheme. Dr Gold has drawn together archive material from British and Canadian sources, much of which was originally classified as TOP SECRET, and written a lively account of the project, well supported with appendices providing the research background.

Size: 250 by 175 cms
323 pages including Appendices and Index
Black and white photographs and line illustrations throughout

ISBN 0 946417 16 4

Published by
The International Glaciological Society
1992

Printed by
Lochem Prepress and Periodiekenservice, The Netherlands



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ICE

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Assisted by D.M. Rootes and S. Stonehouse

This news bulletin is issued to members of the International Glaciological Society and is published three times a year. Contributions should be sent to the Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, England.

Annual cost for libraries, etc., and for individuals who are not members of the Society:

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