

GLACIOLOGICAL LITERATURE

THIS selected list of glaciological literature has been prepared by J. W. Glen with the assistance of T. H. Ellison, W. B. Harland, Miss D. M. Johnson, and the Staff of the Scott Polar Research Institute. Its field is the scientific study of snow and ice and of their effects on the earth; for the literature on polar expeditions, and also on the "applied" aspects of glaciology, such as snow ploughs, readers should consult the bibliographies in each issue of the *Polar Record*. For Russian material the system of transliteration used is that agreed by the U.S. Board on Geographic Names and the Permanent Committee on Geographical Names for British Official Use in 1947. Readers can greatly assist by sending reprints of their publications to the Society, or by informing Dr. Glen of publications of glaciological interest.

GENERAL GLACIOLOGY

- CORDINI, I. R. Glosario de hielos. (*In Derrotero Argentino. Parte 5. Antártida y archipiélagos subantárticos argentinos. Vol. 1.* Buenos Aires, Servicio de Hidrografía Naval, 1958, p. 134-65.) [Glossary of Spanish terms for ice and English equivalents.]
- CROHN, P. W. A contribution to the geology and glaciology of the western part of Australian Antarctic Territory. *Australian National Antarctic Research Expeditions. Reports, Ser. A, Vol. 3, Geology*, 1959, 103 p. [Results of field work, 1955-56.]
- FUCHS, Sir V. E. Research in the Antarctic during 1960. British programme. *Nature*, Vol. 184, No. 4690, 1959, p. 851-52. [Falkland Islands Dependencies Survey programme.]
- HAEFELL, R. Die internationale glaziologische Grönlandexpedition 1957 bis 1960 (E.G.I.G.). *Schweizerische Bauzeitung*, Jahrg. 77, Ht. 29, 1959, 8p. [Reprint.] [Organization, programme and work of International Glaciological Expedition to Greenland, 1957-60.]
- MODEL', Yu. M. O glyatsiologicheskikh issledovaniyakh v rayone observatorii Mirnyy, provedennykh v pervoy kompleksnoy antarkticheskoy ekspeditsii Akademii Nauk SSSR [Glaciological studies in the "Mirnyy" region, carried out by the first complex Antarctic expedition of the Academy of Sciences of the U.S.S.R.]. *Glyatsiologicheskkiye Issledovaniya v Period MGG. Sbornik Statey [Glaciological Studies during the I.G.Y. Collected Papers]*, No. 1, 1959, p. 21-28. [Snow cover, snow and ice temperatures, velocity of land ice, 1955-57. English summary.]
- PASCHINGER, V. Firn und Gletschereis als Handelsgüter. *Schlern-Schriften*, Bd. 190, 1958, p. 189-94. [Commercial exploitation of glacier ice.]
- TUSHINSKIY, G. K., ed. El'brusskaya ekspeditsiya Moskovskogo Gosudarstvennogo Universiteta i Instituta Prikladnoy Geofiziki Akademii Nauk SSSR [Elbrus expedition of Moscow State University and the Institute of Applied Geophysics of the Academy of Sciences of the U.S.S.R.]. *Informatsionnyy Sbornik o Rabotakh po Mezhdunarodnomu Geofizicheskomu Godu [Information Bulletin on Work for the International Geophysical Year]*, No. 2, 1958, 212 p. [Collected papers on glaciological results.]
- [UNION GÉODÉSIQUE ET GÉOPHYSIQUE INTERNATIONALE.] Symposium de Chamonix. Comptes rendus des discussions. *Bulletin de l'Association Internationale d'Hydrologie Scientifique*, No. 13, 1959, p. 9-53. [Report of proceedings and list of participants at Symposium on Physics of Ice Movement, 1958, and discussions of papers. For papers themselves see special volume (Publication No. 47 de l'Association Internationale d'Hydrologie Scientifique).]
- ZUBOV, N. N. O predel'noy tolschine morskikh i materikovykh l'dov [Limiting thickness for sea and land ice]. *Meteorologiya i Gidrologiya [Meteorology and Hydrology]*, 1959, No. 2, p. 22-27. [Ways of calculating these approximately from air temperatures.]

GLACIOLOGICAL INSTRUMENTS AND METHODS

- BOROVINSKIY, B. A., and MAKAREVICH, K. G. Primeneniye elektrometrii pri izuchenii dvizheniya lednikov [Use of electrometry in studying movement of glaciers]. *Vestnik Akademii Nauk Kazakhskoy SSR [Messenger of the Academy of Sciences of the Kazakhskaya S.S.R.]*, 1959, No. 7, p. 45-50. [Experiments in Zailiyskiy Alatau, 1957-59.]
- HIGUCHI, K., and MUGURUMA, J. Etching of ice crystals by the use of plastic replica film. *Journal of the Faculty of Science, Hokkaido University*, Ser. 7, Vol. 1, No. 2, 1958, p. 81-91. [Etching technique described is a simple method for determining crystal axes of ice grains.]
- HOINKES, H. Über ein neues Instrument zur Messung der Strahlungsdurchlässigkeit von Gletschereis oder Schnee. *La Météorologie*, Sér. 4, No. 45-46, 1957, p. 335-37. [New instrument for measuring radiation through ice or snow.]
- HOINKES, H. Zur Bestimmung der Jahresgrenzen in mehrjährigen Schneeanisammlungen. *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. B, Bd. 8, Ht. 1, 1957, p. 56-60. [Determination of annual layers of snow by density distribution.]
- IVERONOVA, M. I. K voprosu ob opredelenii izmeneniy kontsov lednikov sredney Azii metodom povtornykh stereofotos'yemok [Determination of changes at the lower end of central Asian glaciers by means of repeated stereo pairs]. *Glyatsiologicheskkiye Issledovaniya v Period MGG. Sbornik Statey [Glaciological Studies during the I.G.Y. Collected Papers]*, No. 1, 1959, p. 53-61. [Comparison of 1948 and 1955 surveys of Lednik Karabatkak used as example. English summary.]
- QUEILLE-LEFÈVRE, C., and others. Premier essai de mesure électrique d'épaisseur d'un glacier (Glacier de Saint-Sorlin). [By] C. Queille-Lefèvre, Albert Bauer, Girard. *Annales de Géophysique*, Tom. 15, No. 4, 1959, p. 564-67. [Depth measurements by electrical methods of Glacier de Saint-Sorlin, France, 1957.]

- SIL'NITSKAYA, V. I., and CHEREMNYKH, G. D. O metodike izmereniya skorostey dvizheniya l'da poverkhnostnykh chastey nekotorykh lednikov Antarktidi po materialam dvukratnoy aerofotos'yemki [Method of measuring surface velocity of some glaciers of Antarctica by repeated air photography]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1959, No. 5, p. 90-95. [Comparison of air photographs taken in 1956 of two glaciers near "Mimyy".]

PHYSICS OF ICE

- BAKAYEV, V. A., and others. Ponizheniye temperatury plavleniya vody v kapillyarakh poristogo tela [Melting point depression of water in the capillaries of a porous body]. [By] V. A. Bakayev, V. F. Kiselev, K. G. Krasil'nikov. *Doklady Akademii Nauk SSSR* [Reports of the Academy of Sciences of the U.S.S.R.], Tom 125, No. 4, 1959, p. 831-34. [Method of measurement.]
- CARTE, A. E. Probability of freezing. *Proceedings of the Physical Society* (London), Vol. 73, No. 470, 1959, p. 324. [Theory of freezing probability as a function of volume, temperature and time.]
- CONWAY, B. E., and BOCKRIS, J. O'M. On the theory of proton conductance in water and ice. *Journal of Chemical Physics*, Vol. 31, No. 4, 1959, p. 1133-34.
- DANSGAARD, W., and others. Isotopic distribution in a Greenland iceberg, by W. Dansgaard, G. Nief and E. Roth. *Nature*, Vol. 185, No. 4708, 1960, p. 232. [Snow samples from Greenland Ice Sheet show parallelism between deuterium and oxygen-18 content. Analyses of iceberg ice show this parallelism to be conserved during several hundred years.]
- GIGÈRE, P. A. On the anomalous thermodynamic properties of ice. *Physics and Chemistry of Solids*, Vol. 11, No. 3-4, 1959, p. 249-56. [Discussion of heat capacity of ice and explanation in terms of disorder of structure.]
- GONFIANTINI, R., and PICCIOTTO, E. Oxygen isotope variations in Antarctic snow samples. *Nature*, Vol. 184, No. 4698, 1959, p. 1557-58. [Measurements of samples from "Roi Baudouin" base, Princesse Ragnhild Kyst, and interpretation of seasonal variations.]
- HEUVEL, A. P. VAN DEN, and MASON, B. J. Habit of ice crystals grown in hydrogen, carbon dioxide and air at reduced pressure. *Nature*, Vol. 184, No. 4685, 1959, p. 519-20. [Authors unable to confirm Japanese research that habit of ice crystals grown from vapour is essentially modified by growth in hydrogen or air at reduced pressure.]
- JACCARD, C. Étude théorique et expérimentale des propriétés électriques de la glace. *Helvetica Physica Acta*, Vol. 32, Fasc. 2, 1959, p. 89-128. [Study of effect of hydrogen-ion defects in ice and their effects on electrical properties.]
- JELLINEK, H. H. G. Adhesive properties of ice. *Journal of Colloid Science*, Vol. 14, No. 3, 1959, p. 268-80. [Tests on strength of adhesion of ice to steel, polystyrene and "Lucite".]
- LIPPINCOTT, E. R., and others. Infrared studies of dense forms of ice. [By] E. R. Lippincott, C. E. Weir, A. Van Valkenburg. *Journal of Chemical Physics*, Vol. 32, No. 2, 1960, p. 612-14. [Results of experiments used to discuss nature of bonding in ice up to 9000 bars.]
- MASON, B. J. Some recent investigations on the nature and properties of natural and artificial freezing nuclei. *Geofisica Pura e Applicata*, Vol. 42, No. 1, 1959, p. 50-52.
- MELLOR, M. Creep tests on Antarctic glacier ice. *Nature*, Vol. 184, No. 4687, 1959, p. 717. [Tests on Antarctic glacier ice compared with those on laboratory produced specimens.]
- NAKAYA, U. Visco-elastic properties of snow and ice in Greenland ice cap. *Journal of the Faculty of Science, Hokkaido University*, Ser. 2, Vol. 5, No. 3, 1958, p. 119-63. [Determination of resonant frequency and damping of ice and snow samples. Variation of Young's modulus and viscosity with density, temperature and frequency deduced.]
- NAZINTSEV, YU. L. Eksperimental'noye opredeleniye teployemkosti i temperaturoprovodnosti morskogo l'da [Experimental determination of latent heat and temperature conductivity of sea ice]. *Problemy Arktiki i Antarktiki* [Problems of the Arctic and Antarctic], 1959, Vyp. 1, p. 65-71.
- ROBERTS, L. On the melting of a semi-infinite body of ice placed in a hot stream of air. *Journal of Fluid Mechanics*, Vol. 4, Pt. 5, 1958, p. 505-28. [Mathematical treatment of theoretical model.]
- SCHULZ, W. Untersuchung zur Frage der Entstehung der Eisphase aus unterkühlten Wassertropfen. *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. A, Bd. 11, Ht. 1, 1959, p. 64-83. [Experiments on supercooling of water on metal plates.]
- SERIKOV, M. I. Opredeleniye modulya uprugosti l'da rezonansnym metodom [Determination of the modulus of elasticity of ice by a resonance method]. *Problemy Arktiki* [Problems of the Arctic], 1959, Vyp. 6, p. 81-87. [Laboratory experiments on river ice.]
- SHIMAOKA, K. Electron diffraction study of ice. *Journal of the Physical Society of Japan*, Vol. 15, No. 1, 1960, p. 106-19. [Experiments and interpretation in favour of Pauling model for structure of ice.]

LAND ICE. GLACIERS. ICE SHELVES

- AMBACH, W. Ein Beitrag zur Kenntnis der Lichtstreuung im Gletschereis. *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. B, Bd. 9, Ht. 3-4, 1959, p. 441-63. [Discussion of need for determining extinction of radiation in ice in order to assess energy balance in a glacier.]
- AMBACH, W., and MOCKER, H. Messungen der Strahlungsexinktion mittels eines kugelförmigen Empfängers in der oberflächennahen Eisschicht eines Gletschers und im Altschnee. *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. B, Bd. 10, Ht. 1, 1959, p. 84-99. [Measurement of absorption of solar radiation in glacier ice and firn. English and French summaries.]
- [ANTARCTIC REGIONS: MEASUREMENT OF DIMENSIONS OF GLACIERS.] Antarctic traverse reports. *Transactions. American Geophysical Union*, Vol. 40, No. 3, 1959, p. 277-82. [Material relating to possible existence of trans-Antarctic trough between Ross and Weddell seas. Based on 1958-59 traverses.]

- ARNOLD, K. C. *Operation Hazen survey 1957-58*. Ottawa, Defence Research Board, 1959. iii, 96 p. (Hazen 5.) [Location of points for taking of seismic soundings or gravity observations. Determination of rate of movement of Gilman Glacier.]
- BARVENKO, N. YA. Novyye dannyye o dvizhenii i prostranstvennom sostoyanii lednika Tsentral'nogo Tuyuksuyskogo [New data on the movement and dimensions of Lednik Tsentral'nyy Tuyuksuyskiy]. *Voprosy Geografii Kazakhstana* [Questions of the Geography of Kazakhstan], Vyp. 4, 1959, p. 205-08. [Zailiyskiy Alatau.]
- BOUT, P. Cônes de poussières sur neige et sur glace en Islande. *Jökull*, År 8, 1958, p. 10-11. [Dirt cones in Iceland.]
- BROCKAMP, B. Erweiterter Nachtrag zu den wissenschaftlichen Ergebnissen der Deutschen Grönland-Expedition Alfred Wegener. *Deutsche Geodätische Kommission bei der Bayerischen Akademie der Wissenschaften. Reihe B. Angewandte Geodäsie*, Ht. Nr. 48, 1959, 76 p. [Supplement to scientific results of Wegener's Greenland expedition, 1931: the ice sheet: barometrically determined height profiles, thickness and bed rock (seismic measurements), physical properties. Plans for a new Greenland expedition.]
- CAILLEUX, A. Remarques sur le Vatnajökull. *Jökull*, År 8, 1958, p. 12-14. [Thickness, morphology of rock foundation, origin, definition, of this ice cap in Iceland.]
- ERIKSSON, B. E. An experimental study of heat transmission in the surface layers of the Skagastöl Glacier. *Meddelanden från Uppsala Universitets Geografiska Institution*, Ser. A, Nr. 141, 1959, 10 p. [Based on author's field work in Jotunheimen, Norway, 1955 and 1956.]
- GEORGI, J. Der Rückgang des Jacobshavns Isbræ (West-Grönland 69°N.). *Meddelelser om Grönland*, Bd. 158, Nr. 5, 1959, p. 51-70. [Retreat of Jakobshavns Isbræ, West Greenland, since 1850.]
- GORHAM, E. Soluble salts in a temperate glacier. *Tellus*, Vol. 10, No. 4, 1958, p. 496-97.
- HEMMINGSEN, E. Permeation of gases through ice. *Tellus*, Vol. 11, No. 3, 1959, p. 355-59. [Permeation rate of carbon dioxide and oxygen.]
- HOINKES, H. Das glazial-meteorologische Forschungsprogramm in den Ötztaler Alpen. *Berichte des Deutschen Wetterdienstes*, Nr. 54, 1958, p. 54/8-54/13. [Mass and energy balance, radiation through ice and micro-meteorology close to ice surface. Research on these subjects in Ötztal Alps.]
- IVAN'KOV, P. A. Oledeniye Bol'shogo Kavkaza i yego dinamika za gody 1890-1946 [Ice cover of the Great Caucasus and its dynamics, 1890-1946]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [News of the All-Union Geographical Society], Tom 91, Vyp. 3, 1959, p. 220-35.
- KAMB, W. Ice petrofabric observations from Blue Glacier, Washington, in relation to theory and experiment. *Journal of Geophysical Research*, Vol. 64, No. 11, 1959, p. 1891-1909.
- KRAVTSOV, G. S., and TERENT'YEVA, A. G. Rezul'taty seysmicheskikh issledovaniy na vysokogornyykh lednikakh tsentral'nogo Altaya v 1957 g. [Results of seismic studies on mountain glaciers of central Asia in 1957]. *Glyatsiologicheskoye Issledovaniya v Period MGG. Sbornik Statey* [Glaciological Studies during the I.G.Y. Collected Papers], No. 1, 1959, p. 62-68. [Depth measurements of two Altay glaciers. English summary.]
- LISTER, H., and PRATT, G. Geophysical investigations of the Commonwealth Trans-Antarctic Expedition. *Geographical Journal*, Vol. 125, Pt. 3-4, 1959, p. 343-56. [1955-58. Part 1, by H. Lister, the climate and ice mass balance; part 2, by G. Pratt, seismic and gravitational investigations.]
- MAKSIMOV, YE. V. Sovremennoye oledeniye basseynov rek Say-Tentek i Kyzyl-Tentek v Dzhungarskom Alatau [Present ice cover in the basins of the rivers Say-Tentek and Kyzyl-Tentek in the Dzhungarskiy Alatau]. *Voprosy Geografii Kazakhstana* [Questions of the Geography of Kazakhstan], Vyp. 4, 1959, p. 41-72. [Description by expedition of 1957.]
- MARCUS, M. G. Periodic drainage of glacier-dammed Tulsequah Lake, British Columbia. *Geographical Review*, Vol. 50, No. 1, 1960, p. 89-106. [Hypotheses on drainage mechanics.]
- MARUSSI, A. Les résultats des recherches géophysiques de l'expédition italienne au Karakorum, 1954-1955. *Ciel et Terre*, Vol. 75, No. 7-8, 1959, p. 237-45. [Results of gravity depth measurements on Baltoro Glacier and comparison with surface velocities.]
- MELLOR, M. Antarctic ice terminology: ice dolines. *Polar Record*, Vol. 10, No. 64, 1960, p. 92. [Description of feature for which new name is proposed.]
- MELLOR, M., and MCKINNON, G. The Amery Ice Shelf and its hinterland. *Polar Record*, Vol. 10, No. 64, 1960, p. 30-34. [Geographical description. Results of work by Australian National Antarctic Research Expeditions.]
- MILLER, R. D., and CRANDELL, D. R. Time-lapse motion picture technique applied to the study of geological processes. *Science*, Vol. 130, No. 3378, 1959, p. 795-96. [Photographs taken of Emmons Glacier, U.S.A., at 15 min. intervals.]
- MØLLER, J. T. A west Greenland glacier front. A survey of Sermikavsak near Umanak in 1957. *Meddelelser om Grönland*, Bd. 158, Nr. 5, 1959, p. 3-17.
- MOSER, R. Die Gletscher des Dachsteins seit der Mitte des 19. Jahrhunderts. *Jahrbuch des Deutschen Alpenvereins*, Bd. 83, 1958, p. 16-20. [Description of Austrian glaciers and their fluctuations since 1850.]
- NUTT, D. C. Recent studies of gases in glacier ice: a summary. *Polar Notes* (Dartmouth College, Hanover, N.H.), No. 1, 1959, p. 57-65. [Results of Arctic Institute Greenland Expedition, 1958.]
- NYE, J. F. Surface topography of the Antarctic ice sheet. *Nature*, Vol. 184, No. 4689, 1959, p. 786-87. [Theory of propagation of surface waves in an ice sheet and its application to interpret waves in Antarctica.]
- PÉGUY, C.-P. Les glaciers de l'Elbourz. *Bulletin de l'Association de Géographes Français*, No. 284-85, 1959, p. 44-49. [Observations on glaciers of Elburz mountains, north Persia, 1958.]
- PHILBERTH, B. Beseitigung radioaktiver Abfallsubstanzen in den Eiskappen der Erde. *Atomkernenergie*, Jahrg. 4, Ht. 3, 1959, p. 116-19. [Discussion of various problems associated with disposal of radioactive waste in ice sheets.]
- RADOK, U. Temperatures in polar ice caps. *Nature*, Vol. 184, No. 4692, 1959, p. 1056-57. [Theory of temperature distribution.]
- RIGSBY, G. P. Mountain glaciation. *Geophysical Monograph*, No. 2, 1958, p. 182-85. [Summary of American I.G.Y. programme in glaciology.]

- ROBIN, G. DE Q. Progress report on the Antarctic ice sheet. *Polar Record*, Vol. 10, No. 64, 1960, p. 3-10. [Summary discussion of information collected during International Geophysical Year, 1957-58.]
- SHIPTON, E. Explorations in Patagonia. *Geographical Magazine*, Vol. 32, No. 10, 1960, p. 493-505. [Leader's narrative of expedition in neighbourhood of Lago Argentino and Lago Viedma, 1958-59; includes glaciological observations.]
- STEPANOV, I. N. Nekotoryye novyye glyatsiologicheskiye nablyudeniya v doline reki Kok-Su (zapadnyy Tian'-Shan') [Some new glaciological observations in the Kok-Su river valley (western Tian'-Shan)]. *Nauchnyye Doklady Vysshey Shkoly, Geologo-Geograficheskoye Nauki* [Scientific Reports of the High School of Geologo-geographical Science], No. 1, 1959, p. 140-42. [Description of glacier.]
- TOLLNER, H. Strahlungsmessungen auf einer Querung von Zentral- nach Nord-Spitzbergen im Sommer 1955. *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. B, Bd. 10, Ht. 1, 1959, p. 69-83. [Observations of albedo and correlation with state of cryoconite holes. English and French summaries.]
- TSCHAEN, L. *Greenland 1948-1949-1950. Astronomie—nivellement géodésique sur l'Inlandsis. Nouveau calcul*. Paris, Expéditions Polaires Françaises, 1959. 114 p. (Expéditions Polaires Françaises. Missions Paul-Emile Victor, Publication 207.) [Critical study of observations for altitude and position made during summer traverses on ice sheet.]
- TSYKIN, YE. N. O nekotorykh zakonomernostyakh formirovaniya temperaturnogo rezhima lednikov Tian'-Shanya [Some principles of formation of temperature regime of Tian'-Shan glaciers]. *Glyatsiologicheskiye Issledovaniya v Period MGG. Sbornik Statey* [Glaciological Studies during the I.G.Y. Collected Papers], No. 1, 1959, p. 69-82. [English summary.]
- WHITTOW, J. B. The glaciers of Mount Baker, Ruwenzori. *Geographical Journal*, Vol. 125, Pt. 3-4, 1959, p. 370-79. [Uganda. Results of Makerere College expeditions, 1957 and 1958.]
- WICHE, K. Die Österreichische Karakorum-Expedition 1958. *Mitteilungen der Geographischen Gesellschaft Wien*, Bd. 100, Ht. 3, 1958, p. 280-94. [Description of glaciers and glacial geology in Haramosh region of Karakoram.]

ICEBERGS. SEA, RIVER AND LAKE ICE

- BRYAZGIN, N. N. K voprosu ob al'bedo poverkhnosti dreyfuyushchikh l'dov [Surface albedo of drifting ice]. *Problemy Arktiki i Antarktiki* [Problems of the Arctic and Antarctic], 1959, Vyp. 1, p. 33-39. [Difference with differing surfaces, from observations at SP-6, in Central Arctic basin, 1956-57.]
- DORONIN, YU. P. K voprosu o narastanii morskogo l'da [Growth of sea ice]. *Problemy Arktiki i Antarktiki* [Problems of the Arctic and Antarctic], 1959, Vyp. 1, p. 73-80. [Theoretical interpretation of data.]
- KUSUNOKI, K. Measurement of gas bubbles content in sea ice. I. *Low Temperature Science*, Ser. A, No. 17, 1958, p. 123-34. [Method of analysis and discussion of results. In Japanese with English summary.]
- MURAUCHI, S., and others. Seismic prospecting of the [an] Antarctic iceberg and fast ice near the Syowa Base, by S. Murauchi, T. Tateishi and T. Matumoto. *Antarctic Record*, No. 5, 1958, p. 40-50. [Analysis of P wave velocity measurements in a tabular iceberg and in fast ice, Prins Harald Kyst, February 1957. In Japanese with English abstract.]
- SALA, I. Merijään lujuusominaisuksista [On the strength characteristics of sea ice]. *Teknillinen Aikakauslehti*, [Vol.] 49, [No.] 17, 1959, p. 503-04, 507-08, 511-12, 536. [Tests on tensile strength of sea ice of various salinities. Comparison with theory of Anderson and Weeks. English summary.]
- SCHWARZACHER, W. Pack-ice studies in the Arctic Ocean. *Journal of Geophysical Research*, Vol. 64, No. 12, 1959, p. 2357-67. [Study on structure and growth of ice floe.]
- UNTERSTEINER, N. Arctic sea-ice studies. *Transactions. American Geophysical Union*, Vol. 39, No. 3, 1958, p. 601-05: *IGY Bulletin* (Washington, D.C.), No. 12, 1958, p. 11-15. [On University of Washington I.G.Y. drifting station A, Arctic Ocean, 1957-58.]
- WILLIAMS, G. P. Frazil ice: a review of its properties with a selected bibliography. *Engineering Journal*, Vol. 42, No. 11, 1959, p. 55-60. [Also issued as: *Canada. National Research Council. Division of Building Research. Technical Paper No. 81*, 1959.]
- YAKOVLEV, G. N. Teplovoy potok ispareniya s poverkhnosti ledyanogo pokrova v tsentral'noy Arktike [Heat flow by evaporation from the surface of ice cover in the central Arctic]. *Problemy Arktiki i Antarktiki* [Problems of the Arctic and Antarctic], 1959, Vyp. 1, p. 59-63. [Temperature and humidity observations over ice floes at drifting station SP-2, 1950.]

GLACIAL GEOLOGY

- BIRKENMAJER, K. Report on the geological investigations of the Hornsund area, Vestspitsbergen, in 1958. Part III. The Quaternary geology. *Bulletin de l'Académie Polonaise des Sciences. Série des sciences chimiques, géologiques et géographiques*, Vol. 7, No. 3, 1959, p. 197-202. [General geological and glaciological history: south Vestspitsbergen.]
- CHEMEKOV, YU. F. Chetvertichnyye oledeneniya dal'nego vostoka [Quaternary glaciation of the Far East]. *Priroda* [Nature], 1959, No. 7, p. 86-89.
- FRASER, J. K., and HENOCH, W. E. S. *Notes on the glaciation of King William Island and Adelaide Peninsula, N.W.T.* Ottawa, Department of Mines and Technical Surveys, Geographical Branch, [1959]. 39 p. (Miscellaneous Papers Series. Geographical Paper No. 22.) [Description of landforms caused by glacial erosion and deposition and reconstruction of glacial history.]
- GALON, R. Nowe badania geomorfologiczne na sandrze Brdy [New geomorphological researches on the sandr of Brda]. *Zeszyty Naukowe Uniwersytetu Mikołaja Kopernika w Toruniu, Nauki Matematyczno-Przyrodnicze* [Scientific Papers of the Nicholas Copernicus University in Toruń, Mathematical and Natural Sciences], Zeszyt 4, 1958, p. 3-9. [Review of recent work on this outwash plain in Poland and introduction to issue devoted to papers on this topic. French summary p. 8-9.]

- IVES, J. D. Mountain-top detritus and the extent of the last glaciation in northeastern Labrador-Ungava. *Canadian Geographer*, No. 12, 1958, p. 25-31. [Presence of disintegrated bed-rock *in situ* possible indication of ice-free area.]
- IVES, J. D. Glacial drainage channels as indicators of late-glacial conditions in Labrador-Ungava: a discussion. *Cahiers de Géographie de Québec*, 3^e An., No. 5, 1958-59, p. 57-72. [Description of features and tentative conclusion that mean average temperature during final melting was comparable with, if not higher than, that of today.]
- KING, C. A. M. Geomorphology in Austerdalen, Norway. *Geographical Journal*, Vol. 125, Pt. 3-4, 1959, p. 357-69. [Work by various parties, 1954-58, on glacier system of Austerdalsbre.]
- LUNDHOLM, B. Problemet om glacial övervintring. Övervintring på Nordsjöländet? *Statens Naturvetenskapliga Forskningsråds Årsbok*, Årg. 12, 1959, p. 138-42. [Possibility of survival of flora and fauna in ice-free area in southern part of North Sea area during last Ice Age. English summary.]
- LUNDBQVIST, G. Kvartärgeologisk forskning i Sverige under ett sekel. *Svenska Geologiska Undersökning, Avhandlingar och Uppsatser, Ser. C*, No. 561, *Årsbok* 52, No. 4, 1958, 57 p. [Quaternary geological research in Sweden, 1858-1958, including Lapland.]
- MEHDIRATTA, R. C. Indications of glacierization in the Sivalik system in India. *Nature*, Vol. 184, No. 4689, 1959, p. 833-34. [Interpretation of deposits as showing glacierization of early Pleistocene age.]
- TUSHINSKIY, G. K. Nekotoryye problemy glyatsiologii, voznikshiy v svyazi s izucheniym El'brusa i Khibin [Some problems of glaciology arising in connection with study of El'brus and Khibiny]. *Glyatsiologicheskkiye Issledovaniya v Period MGG. Sbornik Statey [Glaciological Studies during the I.G.Y. Collected Papers]*, No. 1, 1959, p. 29-35. [Argument that much alleged glacial action on topography and relief is caused by snow and not by glaciers. English summary.]
- WEBB, P. N., and MCKELVEY, B. C. Geological investigations in south Victoria Land, Antarctica. Part 1. Geology of Victoria dry valley. *New Zealand Journal of Geology and Geophysics*, Vol. 2, No. 1, 1959, p. 120-36. [Glacier from main ice cut through mountains of south Victoria Land to Ross Sea. In McMurdo Sound area some glacier retreat has formed "dry valleys".]
- WISSMAN, H. VON. Die rezente und quartäre Vergletscherung des Yülungschan. *Mitteilungen der Österreichischen Geographischen Gesellschaft*, Bd. 101, Ht. 2, 1959, p. 165-82. [Present-day glacierization and former ice cover in Yulungshan mountains in Yunnan Province.]

FROST ACTION ON ROCKS AND SOIL. FROZEN GROUND. PERMAFROST

- CAILLEUX, A. Observations sur quelques lacs ronds nord-américains. *Cahiers de Géographie de Québec*, 3^e An., No. 6, 1959, p. 139-47. [Air observations. Suggests possible periglacial origin for circular lakes.]
- CHICHAGOV, V. P. Naledi i snezhniki v dolinakh Ingody i Shilki [Naleds and snow patches in the valleys of the Ingoda and Shilka rivers]. *Priroda [Nature]*, 1959, No. 7, p. 85-96. [Observations on ice and snow patches in Chitinskaya Oblast'.]
- DOLLFUS, O. Formes glaciaires et périglaciaires actuelles autour du lac Huampar. *Bulletin de l'Association de Géographes Français*, No. 286-87, 1959, p. 32-40. [Description of glaciers and frost action in this region of Peru.]
- [FROZEN GROUND.] *Materialy po inzhenernomu merzlotovedeniyu [Materials on engineering permafrostology]*. Moscow, Akademiya Nauk SSSR, Institut Merzlotovedeniya [Academy of Sciences of the U.S.S.R., Institute for the Study of Frozen Ground], 1959. 203 p. [23 papers read at conference, Moscow, 1956, on engineering installations in frozen ground, especially foundations for buildings and dams for hydraulic projects.]
- GODDARD, A. Contemporary periglacial phenomena in western Scotland. *Scottish Geographical Magazine*, Vol. 75, No. 1, 1959, p. 55. [Examples of polygons and stone stripes.]
- KACHURIN, S. P. Termokarst v predelakh SSSR [Thermokarst in the U.S.S.R.]. (*In Materialy po obshchemu merzlotovedeniyu [Materials on general frozen ground study]*). Moscow, Akademiya Nauk SSSR, Institut Merzlotovedeniya [Academy of Sciences of the U.S.S.R., Institute for the Study of Frozen Ground], 1959, p. 152-61.) [Conditions of formation, mode of development and types of relief.]
- KOSOV, B. F. Ovrzhnaya erosiya v zone tundry [Ravine erosion in tundra zones]. *Nauchnyye Doklady Vysshey Shkoly, Geologo-Geograficheskkiye Nauki [Scientific Reports of the High School of Geologo-geographical Science]*, No. 1, 1959, p. 123-29. [Discussion of mechanism of ravine formation by frost action.]
- LOW, P. F., and LOVELL, C. W. The factor of moisture in frost action. *Bulletin. [U.S.] Highway Research Board*, 225, 1959, p. 23-44. [Review of relevant properties of water and ice.]
- MASSEPORT, J. Premiers résultats d'expériences de laboratoire sur les roches. *Revue de Géographie Alpine*, Tom. 47, Fasc. 4, 1959, p. 531-37. [Preliminary and tentative laboratory tests of effects of frost action on calcareous rocks.]
- PENNER, E. The mechanism of frost heaving in soils. *Bulletin. [U.S.] Highway Research Board*, 225, 1959, p. 1-22. [Laboratory experiments and theory of frost heaving.]
- PÉWÉ, T. L. Sand-wedge polygons (tessellations) in the McMurdo Sound region, Antarctica: a progress report. *American Journal of Science*, Vol. 257, No. 8, 1959, p. 545-52. [Results of observations, 1957-58.]
- ROMANOVSKIY, N. N. K voprosu o formirovaniy singeneticheskikh treshchino-zhil'nykh l'dov [Formation of syngenetic ice in veins]. *Glyatsiologicheskkiye Issledovaniya v Period MGG. Sbornik Statey [Glaciological Studies during the I.G.Y. Collected Papers]*, No. 1, 1959, p. 83-85. [Mode of formation of veins and lenses of ice in frozen ground. English summary.]
- SAVEL'YEV, B. A. Metod eksperimental'nogo izucheniya usloviy vozniknoveniya l'da i dal'neyshego yego rosta v obratzakh v protsesse ikh zamerzaniya i izucheniya protsessov izmeneniya plotnosti snega i yego struktury [Method of experimental study of the conditions of formation and growth of ice in soil samples during freezing, and study of the processes of change of snow density and of its structure]. *Glyatsiologicheskkiye Issledovaniya v Period MGG. Sbornik Statey [Glaciological Studies during the I.G.Y. Collected Papers]*, No. 1, 1959, p. 91-93. [Apparatus described. English summary.]

- THORÉN, R. Frost problems and photo interpretation of patterned ground. *Photogrammetric Engineering*, Vol. 25, No. 5, 1959, p. 779-86.
- TSYTOVICH, N. A., ed. *Osnovy geokriologii (merzlotovedeniya). Chast' pervaya. Obshchaya geokriologiya.—Chast' vtoraya. Inzhenernaya geokriologiya [Principles of geocryology (permafrost studies). Part one. General geocryology.—Part two. Engineering geocryology]*. Moscow, Izdatel'stvo Akademii Nauk SSSR [Publishing House of the Academy of Sciences of the U.S.S.R.], 1959, 2 vols. [Fundamental textbook, replacing *Obshcheye merzlotovedeniye [General permafrost studies]* (Moscow, 1940), edited by M. I. Sumgin.]
- VTYURIN, B. I. Geokriologicheskiye nablyudeniya v vostochnoy Antarktide v 1956-1957 gg. [Geocryological observations in eastern Antarctica in 1956-57]. *Glyatsiologicheskiye Issledovaniya v Period MGG. Sbornik Statey [Glaciological Studies during the I.G.Y. Collected Papers]*, No. 1, 1959, p. 7-20. [Soil temperature and relief at three ice-free regions. English summary.]
- WILLIAMS, P. J. An investigation into processes occurring in solifluction. *American Journal of Science*, Vol. 257, No. 7, 1959, p. 481-90. [Below a late snow patch, central Norway, 1956 and 1957.]
- WILLIAMS, P. J. Solifluction and patterned ground in Rondane. *Skrifter utgitt av det Norske Videnskaps-Akademi i Oslo. I. Mat.-Naturv. Klasse*, 1959, No. 2, 16 p. [South Norway.]

METEOROLOGICAL AND CLIMATOLOGICAL GLACIOLOGY

- APPLEMAN, H. An investigation into the formation of hail. *Nubila*, An. 2, No. 1, 1959, p. 28-37.
- BENNETT, I. Glaze, its meteorology and climatology, geographical distribution, and economic effects. [U.S. Army.] *Quartermaster Research and Engineering Command. Environmental Protection Research Division. Technical Report EP-105*, 1959, 217 p. [Review of occurrence and effects of glazed frost.]
- GEORGI, J. Das Klima des nordgrönländischen Inlandeises. *Annalen der Meteorologie*, Bd. 8, Ht. 9-10, 1959, p. 259-63. [Climatological study of north Greenland ice sheet based on results of British North Greenland Expedition, 1952-54, compared with figures from Wegener's expedition, 1930-31, and French expedition, 1948-53.]
- HAMILTON, R. A. The pressure gradient at the edge of an ice sheet. *Quarterly Journal of the Royal Meteorological Society*, Vol. 85, No. 364, 1959, p. 166-67. [Comparison with sea-level pressures indicates that there is no unusually steep pressure gradient at edge of inland ice in north-east Greenland.]
- KUHLMAN, H. Weather and ablation observations at Sermikavsak in Umanak district. *Meddelelser om Grønland*, Bd. 158, Nr. 5, 1959, p. 19-50. [Observations in 1957 at this glacier on Upernivik Ø, West Greenland.]
- LIST, R. Wachstum von Eis-Wassergemischen im Hagelversuchskanal. *Helvetica Physica Acta*, Vol. 32, Fasc. 4, 1959, p. 293-96. [Wind-tunnel experiments on accretion of ice.]
- MANLEY, G. The late-glacial climate of north-west England. *Liverpool and Manchester Geological Journal*, Vol. 2, Pt. 2, 1959, p. 188-215. [Re-establishment of small glaciers about 9,000 B.C.]
- VITTORI, O., and CAPORACCO, G. DI. The density of hailstones. *Nubila*, An. 2, No. 1, 1959, p. 51-57. [Methods of measuring density of hailstones; densities approaching those of pure ice have been found.]

SNOW

- LUR'YE, I. S., and SAVEL'YEV, B. A. Zavisimost' mekhanicheskikh svoystv snega ot plotnosti i temperaturnogo rezhima [Dependence of mechanical properties of snow on density and temperature regime]. *Glyatsiologicheskiye Issledovaniya v Period MGG. Sbornik Statey [Glaciological Studies during the I.G.Y. Collected Papers]*, No. 1, 1959, p. 94-99. [Laboratory tests of compressive strength. English summary.]
- MANLEY, G. On the frequency of snowfall in metropolitan England. *Quarterly Journal of the Royal Meteorological Society*, Vol. 84, No. 359, 1958, p. 70-72.
- MARTINELLI, M., jr. Some hydrologic aspects of alpine snowfields under summer conditions. *Journal of Geophysical Research*, Vol. 64, No. 4, 1959, p. 451-55. [Ablation, density and weather conditions on 5 selected snowfields on eastern side of Front Range in central Colorado are measured and discussed.]
- MUGURUMA, J., and HIGUCHI, K. On the etch pits of snow crystals. *Journal of the Meteorological Society of Japan*, Ser. 2, Vol. 37, No. 2, 1959, p. 71-75. [Thermal and chemical etching shows that snow crystal developed from one centre nucleus is a single crystal.]
- PARDÉ, M. Quelques problèmes relatifs à la climatologie et à l'hydrologie des montagnes. *La Météorologie*, Sér. 4, No. 45-46, 1957, p. 231-36. [Suggests that spring floods are often incorrectly attributed to snow melt. English and German summaries p. 231.]
- POGGI, A. La neve al sol. *La Météorologie*, Sér. 4, No. 45-46, 1957, p. 95-100. [General discussion of snow cover, its characteristics and metamorphosis. English and Spanish summaries p. 95.]
- POGGI, A. Analyse des avalanches au cours de l'hiver 1954-1955 dans la région de la Romanche et du Vénéon et dans la vallée de Chamonix. *La Météorologie*, Sér. 4, No. 45-46, 1957, p. 65-93. [Analysis of effect of different meteorological factors in causing avalanches. English and Spanish summaries p. 65.]
- SAVEL'YEV, B. A. O vlagopogloshchayushchey sposobnosti i fil'tratsii snega [On the water-absorbing property and permeability of snow]. *Glyatsiologicheskiye Issledovaniya v Period MGG. Sbornik Statey [Glaciological Studies during the I.G.Y. Collected Papers]*, No. 1, 1959, p. 87-90. [English summary.]

Several papers accepted for publication, including those from W. V. Lewis, M. Holland and E. Thiel and N. Ostenso, have unavoidably been held over until March 1961.