

## GLACIOLOGICAL LITERATURE

This is a selected list of glaciological literature on 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. J. W. Glen of publications of glaciological interest. It should be noted that the Society does not necessarily hold copies of the items in this list, and also that the Society does not possess facilities for microfilming or photocopying.

### GENERAL GLACIOLOGY

- HATHERTON, T., ed. *Antarctica*. London, Methuen; New York, Frederick A. Praeger, 1965. xvi, 511 p. [Contents include: J. A. Heap, "Antarctic pack ice", p. 187-96; C. W. M. Swithinbank and J. H. Zumberge, "The ice shelves", p. 199-220; A. J. Gow, "The ice sheet", p. 221-58; C. R. Bentley, "The land beneath the ice", p. 259-77; R. H. Clark, "The oases in the ice", p. 321-30; M. J. Rubin and W. S. Weyant, "Antarctic meteorology", p. 375-401.]
- KOSIBA, A. On the international glaciological terminology. *Acta Geophysica Polonica*, Vol. 13, No. 1, 1965, p. 9-14. [Proposals as to how a glossary should be compiled.]
- LORUIS, C., and RICOU, G. Glaciologie—Terre Adélie 1962. *Expéditions Polaires Françaises, Missions Paul-Émile Victor, Publication No. 271*, [1965], 37 p. [Description of glaciological laboratory at base Dumont d'Urville; measurements made of gas occlusions in ice, snow accumulation and deuterium content of sea water.]
- SPANO, A. F. Results of an airborne albedo program in Antarctica, 1963. *Monthly Weather Review*, Vol. 93, No. 11, 1965, p. 697-703.

### GLACIOLOGICAL INSTRUMENTS AND METHODS

- AMBACH, W., and others. Ein Gerät zur Bestimmung des freien Wassergehaltes in der Schneedecke durch dielektrische Messung, von W. Ambach, W. Bitterlich, und F. Howorka. *Acta Physica Austriaca*, Bd. 20, Ht. 1-4, 1965, p. 247-52. [Apparatus for estimation of free water content in snow cover through dielectric measurement.]
- ARNBORG, L., and others. The ice gauge. An instrument for measuring vertical movement of ice surfaces, by L. Arnborg, J. Peippo and R. Larsson. *Geografiska Annaler*, Vol. 47A, No. 4, 1965, p. 237-39. [Self-recording instrument to synchronize the movements of the ice with the water-surface fluctuations.]
- BINDON, H. H. The design of snow samplers for Canadian snow surveys. *Proceedings of the Eastern Snow Conference*, 21st annual meeting, 1964, p. 23-38. [Tests with standard samplers, and adaptations for use under Canadian conditions.]
- BOGORODSKIY, V. V. *Modern physical methods of measuring the thickness of sea ice. Translated by E. R. Hope*. Ottawa, Directorate of Scientific Information Services, 1964. 10 p. (Canada. Defence Research Board. Translation T410R.) [Translated from *Okeanologiya*, Tom 3, Vyp. 4, 1963, p. 720-30. Various close-contact and remote methods reviewed. Electromagnetic remote methods seem to be most promising.]
- EVANS, S., and ROBIN, G. DE Q. Glacier depth-sounding from the air. *Nature*, Vol. 210, No. 5039, 1966, p. 883-85. [Results of surveys on various glaciers and discussion of advantages for surveys on ice sheets and inaccessible regions.]
- FREEMAN, T. G. Snow survey samplers and their accuracy. *Proceedings of the Eastern Snow Conference*, 22nd annual meeting, 1965, p. 1-10. [Comparative tests on 7 samples.]
- HASHIMOTO, T., and MANIWA, Y. Keppyōko ni okeru hyōjō yori no suishin-sokuryō to wakasagi tanchi no jikken (2) [Echo sounding of frozen lake and detection of pond-smelt from surface of ice (2)]. *Gyosen Kenkyū Gihō* [Technical Report of Fishing Boat], Vol. 18, No. 2, 1963, p. 1-5. [Better results obtained using low frequency ultrasonic waves than with mm. waves. English summary.]
- HOFMANN, W. Tellurometermessungen im Rahmen der glaziologischen Antarktisforschung. *Allgemeine Vermessungsnachrichten*, Bd. 71, Ht. 3, 1964, p. 82-86. [Surveying technique used on Ross Ice Shelf Survey.]
- KUDŌ, H., and others. Sekisetsu teremeta sochi [Snow gauge telemetering system utilizing radioisotope], [by] H. Kudō, S. Umeda [and] M. Hagimoto. *Fujitsu* [Fuji Tsūshinki Seizō Kabushiki Kaisha [Fuji Communication Equipment Manufacturing Co. Ltd.], Tokyo], Vol. 15, No. 1, 1964, p. 33-42. [Japanese system for recording snowfall. English abstract.]
- LANDON-SMITH, I. H., and WOODBERRY, B. The photoelectric metering of wind-blown snow. *ANARE Interim Reports*, Series A (IV), Publication No. 79, 1965, p. 1-18. [Design and calibration of instrument.]
- LUGIEZ, F., and others. Recherche d'améliorations sur le nivomètre à absorption de rayonnement  $\gamma$ , [par] F. Lugiez, P. Guillot, M. Jacob et M. Vuillot. [Union Géodésique et Géophysique Internationale.] *Association Internationale d'Hydrologie Scientifique. Assemblée générale de Berkeley de l'UGGI, 19-8-31-8 1963. Erosion continentale, précipitations, hydrométrie, humidité du sol*, 1964, p. 417-22. [Studies of a field version of the radioactive snow-gauge.]
- NYBERG, A. A study of the evaporation and the condensation at a snow surface. *Arkiv för Geofysik*, Bd. 4, Nr. 30, 1965, p. 577-90. [Instrument designed to measure with great accuracy the evaporation from a snow surface.]
- ØSTREM, G., and STANLEY, A. *Glacier mass balance measurements: a manual for field work*. Ottawa, Department of Mines and Technical Surveys, 1966. [vii], 81 p. + 15 forms. [Describes field procedures being used in Canada during International Hydrological Decade.]
- WISHART, E. R. A new photoelectric drift snow gauge. *ANARE Interim Reports*, Series A (IV), Publication No. 79, 1965, p. 19-26. [Design and calibration of instrument.]

ZINGG, T. Zur Methodik der Schneemessung am Eidg. Institut für Schnee- und Lawinenforschung. *Winterbericht des Eidg. Institutes für Schnee- und Lawinenforschung*, Nr. 27, 1964, p. 130–38. [Methods of measuring depth, water content, and density of new and total snowfall in Weissfluhjoch area.]

## PHYSICS OF ICE

- ALKEZWEENY, A. J., and HOBBS, P. V. The reflection spectrum of ice in the near infrared. *Journal of Geophysical Research*, Vol. 71, No. 4, 1966, p. 1083–86. [Measurement as function of angle from wave-length  $2.5 \mu$  to  $5 \mu$ .]
- BARNES, G. T. Phase transitions in water sorbed on ice forming nuclei. *Zeitschrift für angewandte Mathematik und Physik*, Vol. 14, Fasc. 5, 1963, p. 510–18. [Nuclear magnetic resonance used to study state of water molecules on surfaces.]
- BARNES, P., and TABOR, D. Plastic flow and pressure melting in the deformation of ice I. *Nature*, Vol. 210, No. 5039, 1966, p. 878–82. [Results of indentation tests on ice at various temperatures. Comments, "Implications for glaciology", by P. Barnes and G. de Q. Robin, p. 882–83.]
- BARTLETT, J. T. The growth of ice crystals from water vapour. *Colloques Internationaux du Centre National de la Recherche Scientifique*, No. 152, 1965, p. 317–28. [Discusses the variation with temperature of the habit of ice crystals discussed in terms of stepped growth and rapid change of surface diffusion length with temperature. Discussion, p. 326–28.]
- BARTLETT, J. T., and others. The growth of ice crystals in an electric field, by J. T. Bartlett, A. P. van den Heuvel [sic, i.e. A. P. van den Heuvel] and B. J. Mason. *Zeitschrift für angewandte Mathematik und Physik*, Vol. 14, Fasc. 5, 1963, p. 599–610. [Observation of growth of thin ice needles in presence of high electric field.]
- BERTIE, J. E., and others. Transformations of ice VI and ice VII at atmospheric pressure, [by] J. E. Bertie, L. D. Calvert and E. Whalley. *Canadian Journal of Chemistry*, Vol. 42, No. 6, 1964, p. 1373–78. [Like ice II, III and V investigated earlier, these high-pressure phases transform first to cubic ice and then to hexagonal ice.]
- BLOCK, S., and others. High-pressure single-crystal studies of ice VI, [by] S. Block, C. W. Weir [and] G. J. Piermarini. *Science*, Vol. 148, No. 3672, 1965, p. 947–48. [Method of producing single crystals of ice VI and determination of cell constants.]
- DYE, J. E., and HOBBS, P. V. Effect of carbon dioxide on the shattering of freezing water drops. *Nature*, Vol. 209, No. 5022, 1966, p. 464–66. [Experiments to show effect of carbon dioxide gas.]
- FEDERER, B. Eiskeimfähigkeit von Zinkselenid. *Zeitschrift für angewandte Mathematik und Physik*, Vol. 14, Fasc. 5, 1963, p. 518–22. [Study of factors affecting ice-forming ability of zinc selenide.]
- FLETCHER, N. H. Some molecular aspects of ice crystal nucleation. *Zeitschrift für angewandte Mathematik und Physik*, Vol. 14, Fasc. 5, 1963, p. 487–96. [Discussion of molecular mechanisms.]
- FUKUTA, N. Production of ice crystals in air by a pressure-pack method. *Journal of Applied Meteorology*, Vol. 4, No. 4, 1965, p. 454–56. [Spraying a highly volatile liquid into moist air can cool the air sufficiently for condensed water droplets to freeze by homogeneous nucleation.]
- GEORGI, H.-W. Investigations on the deactivation of inorganic and organic freezing-nuclei. *Zeitschrift für angewandte Mathematik und Physik*, Vol. 14, Fasc. 5, 1963, p. 503–10.
- GLICK, R. E., and TEWARI, K. C. Proton nuclear magnetic relaxation studies on water: the rates of acid- and base-catalyzed proton exchange. *Journal of Chemical Physics*, Vol. 44, No. 2, 1966, p. 546–47. [Activation energies and rate constants determined for proton exchange between  $H_3O^+$  and  $H_2O$  and between  $H_2O$  and  $H_2O$ .]
- GLIKI, N. V., and YELISEYEV, A. A. O vliyaniy peresyscheniya i temperatury na kinetiku razvitiya nachal'nykh form rosta ledyanogo shara [Effects of supersaturation and temperature on the development kinetics of the initial growth forms on a sphere of ice]. *Kristallografiya [Crystallography]*, Tom 7, No. 5, 1962, p. 802–04. [Observations of time delay and growth rate of  $\{1010\}$  and  $\{10\bar{1}1\}$  faces on small ice spheres. English translation in *Soviet Physics—Crystallography*, Vol. 7, No. 5, 1963, p. 649–50.]
- GOSAR, P. On the mobility of the  $H_3O^+$  ion in ice crystals. *Nuovo Cimento*, Ser. 10, Vol. 30, No. 3, 1963, p. 931–46. [Theory of the tunnelling of protons along a bond with an  $H_3O^+$  ion at one end. Deduces mobility and relaxation time.]
- GOSAR, P., and PINTAR, M.  $H_3O^+$  ion energy bands in ice crystals. *Physica Status Solidi*, Vol. 4, No. 3, 1964, p. 675–83. [Theory of the movement of ion states in ice due to proton tunnelling.]
- GROSS, G. W. The Workman–Reynolds effect and ionic transfer processes at the ice–solution interface. *Journal of Geophysical Research*, Vol. 70, No. 10, 1965, p. 2291–300. [Measurement of electrical and chemical effects on freezing dilute solutions.]
- HOCHSTEIN, M. Elektrische Widerstandsmessungen auf dem grönländischen Inlandeis. *Meddelelser om Grønland*, Bd. 177, Nr. 3, 1965, p. 1–39. [Electrical D.C. resistivity measurements indicate that at depths greater than 300 m the resistivity of ice is  $0.025$ – $0.085$  megohm m.]
- KAISER, G., and MAGUN, S. Schmelzvorgänge in Eiskristallen unter erhöhtem Druck. *Zeitschrift für Kristallographie*, Bd. 120, Ht. 6, 1964, p. 450–65. [Observation of melting phenomena in ice crystals raised above their melting point by high pressure.]
- KAMB, W. B. Structure of ice VI. *Science*, Vol. 150, No. 3693, 1965, p. 205–09. [Report of structure of ice VI and of unit cell and space group of ice V.]
- KOBAYASHI, T. Vapour growth of ice crystal between  $-40$  and  $-90^\circ C$ . *Journal of the Meteorological Society of Japan*, Ser. 2, Vol. 43, No. 6, 1965, p. 359–67. [Observations of habit of growth at various supersaturations.]
- LATHAM, J. A mechanism of charge transfer in ice. *Weather*, Vol. 21, No. 3, 1966, p. 79–85. [Charge transfer produced by the asymmetric rubbing of ice; influence of ice crystal geometry and impact velocity; and electrification associated with the evaporation of ice.]

- MCDONALD, J. E. A thermodynamic relation in the theory of homogeneous nucleation of super-cooled droplets. *Journal of the Atmospheric Sciences*, Vol. 21, No. 2, 1964, p. 225-26. [Corrects errors in calculation of free energy of freezing droplets.]
- MCDONALD, J. E. Use of the electrostatic analogy in studies of ice crystal growth. *Zeitschrift für angewandte Mathematik und Physik*, Vol. 14, Fasc. 5, 1963, p. 610-20.
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- PARREIRA, H. C., and EYDT, A. J. Electric potentials generated by freezing dilute aqueous solutions. *Nature*, Vol. 208, No. 5005, 1965, p. 33-35. [Measurement and interpretation in terms of electrical properties of ice and ionic entrapment and diffusion.]
- RABIDEAU, S. W., and WALDSTEIN, P. Oxygen-17 NMR in polycrystalline H<sub>2</sub>O and D<sub>2</sub>O ice. *Journal of Chemical Physics*, Vol. 44, No. 3, 1966, p. 1304-05. [Letter. Measurements reported.]
- SEIDENSTICKER, R. G. Comment on paper by P. Hoekstra, T. E. Osterkamp and W. F. Weeks, "The migration of liquid inclusions in single ice crystals". *Journal of Geophysical Research*, Vol. 71, No. 8, 1966, p. 2180-81. [Points out that more accurate theory accounts quantitatively for data on migration of NaCl and KCl inclusions in ice.]
- TAKAHASHI, T. Thermoelectric effect in ice. *Journal of the Atmospheric Sciences*, Vol. 23, No. 1, 1966, p. 74-77. [Measurement in single crystal ice, polycrystalline ice with bubbles, and ice formed from HF solution. Change of sign of effect at about -10°C.]
- THORPE, A. D., and MASON, B. J. The evaporation of ice spheres and ice crystals. *British Journal of Applied Physics*, Vol. 17, No. 4, 1966, p. 541-48. [Measurements of evaporation rates. Includes difference of rates between spheres, plates and dendrites.]
- WARBURTON, J. A., and HEFFERNAN, K. J. Time lag in ice crystal nucleation by silver iodide. *Journal of Applied Meteorology*, Vol. 3, No. 6, 1964, p. 788-91. [Measurements in qualitative agreement with Fletcher's theory.]
- WEIR, C., and others. Single-crystal X-ray diffraction at high pressures, by C. Weir, S. Block and G. Piermarini. *Journal of Research of the National Bureau of Standards*, Vol. 69C, No. 4, 1965, p. 275-81. [Details of apparatus and results for ice VI and ice VII from which a unit cell for ice VI is deduced.]
- WEISSMANN, M. Deuteron quadrupole coupling in D<sub>2</sub>O. *Journal of Chemical Physics*, Vol. 44, No. 1, 1966, p. 422-23. [Letter. Reports results of a quantum-mechanical calculation which agrees with experimental results.]
- ZETTMLOYER, A. C., and others. Ice nucleation by hydrophobic substrates, by A. C. Zettlemoyer, N. Tcherekdjian and C. L. Hosler. *Zeitschrift für angewandte Mathematik und Physik*, Vol. 14, Fasc. 5, 1963, p. 496-502. [Discussion of conditions for production of nuclei.]
- ZIEGLER, G. *Strukturuntersuchungen an Eis bei tiefen Temperaturen*. Stuttgart, Technische Hochschule, 1962. 42 p. [Researches on structure of ice at low temperatures.]

## LAND ICE. GLACIERS. ICE SHELVES

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- BAUER, A., and LORIUS, C. The polar ice-caps. *Impact of Science on Society*, Vol. 14, No. 4, 1964, p. 223-38. [General review of our knowledge of the Greenland and Antarctic Ice Sheets.]
- CRAIG, H. Discussion of paper by S. Epstein, R. P. Sharp and A. J. Gow, "Six-year record of oxygen and hydrogen isotope variations in South Pole firn". *Journal of Geophysical Research*, Vol. 71, No. 4, 1966, p. 1287-88. [Letter. Points out differences in deviations of oxygen and hydrogen isotope variations from those found in natural precipitation samples.]
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- HUSEBYE, E. S., and others. The determination of the thickness of Finsterwalderbreen, Spitsbergen, from gravity measurements, by E. S. Husebye, A. Sørnes and L. S. Wilhelmsen. *Norsk Polarinstitut. Årbok*, 1963 [pub. 1965], p. 129-36. [Field work in Vestspitsbergen in 1962.]
- JÓHANSSON, M. Vatnajökulsleiðangur 1964. *Jökull*, [Vol.] 3, Ár 14, 1964, p. 95-96. [Icelandic expedition to Vatnajökull in 1964.]

- KAPITSA, A. P., and SOROKHTIN, O. G. Rel'yef lednikovogo pokrova i podlednogo lozha Zemli Kololevy Mod [Glacial and sub-glacial relief in Dronning Maud Land]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii* [Information Bulletin of the Soviet Antarctic Expedition], No. 51, 1965, p. 23-26. [Observations by Soviet traverse in 1964.]
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- KEELER, C. M. Relationship between climate, ablation and run-off on the Sverdrup Glacier, 1963, Devon Island, N.W.T. *Arctic Institute of North America. Research Paper* No. 27, 1964, 125 p. [An attempt to account for short term disagreements between the amounts of (1) ablation calculated from an energy balance study, (2) ablation calculated from surface lowering measurements, and (3) ablation calculated from measurements of the discharge of a supraglacial stream.]
- KINOSITA, S. Daisetsu-san no sekkei chōsa (dai 1 nendo) [Studies of firn on Mt. Daisetsu in summer. I]. *Teion-kagaku* [Low Temperature Science], Ser. A, Vol. 23, 1965, p. 121-27. [Observations on a mountain in central Hokkaido, Japan. English summary.]
- KÖRNER, H. Schnee- und Eismechanik und einige ihrer Beziehungen zur Geologie. *Felsmechanik und Ingenieurgeologie*, Vol. 2, No. 1, 1964, p. 45-67. [Review of work in ice mechanics and its application to theory of glacier flow and certain geological topics. English summary.]
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- KRUCHININ, YU. A. *Shel'fovyie ledniki Zemli Korolevy Mod* [Ice shelves of Dronning Maud Land]. Leningrad, Gidrometeorologicheskoye Izdatel'stvo [Hydrological and Meteorological Publishing House], 1965. 180 p. [Descriptive.]
- LIESTØL, O. Noen resultater av bremålinger i Norge i 1963. *Norsk Polarinstittutt. Årbok*, 1963 [pub. 1965], p. 185-92. [Glacier investigations in Norway in 1963; mainly regime on Storbreen and Hardangerjøkulen, south Norway. English summary.]
- MAKSIMOV, YE. V. Ledniki Kirgizskogo Alatau [Glaciers of Kirgizskiy Alatau]. *Priroda* [Nature], 1964, No. 10, p. 95-99.
- MEIER, M. F. Glaciers and climate. (In Wright, H. E., jr., and Frey, D. G., ed. *The Quaternary of the United States*. Princeton, Princeton University Press, 1965, p. 795-805.) [General discussion of the theory of glaciers, response to climate and its implications for glaciers in the U.S.A.]
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- SHUMSKIY, P. A., and BAUER, A. Issledovaniye sovremennykh izmeneniy tsentral'noy chasti lednikovogo pokrova vostochnoy Antarktity v 1964 g. [Study of recent changes in the central part of the ice sheet of eastern Antarctica in 1964]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii* [Information Bulletin of the Soviet Antarctic Expedition], No. 51, 1965, p. 37-51. [Narrative of Soviet-French traverse "Vostok"-Mirny in 1964, when six polygons were laid out on ice surface to allow measurement of strain rates.]
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- ZABIROV, R. D., ed. Glyatsiologicheskkiye issledovaniya na Tyan'-Shane [Glaciological studies in the Tien Shan]. *Raboty Tyan'-Shan'skoy Fiziko-Geograficheskoy Stantsii* [Works of the Tien Shan Physics and Geography Station], Vyp. 6, 1964, 127 p.

ZINGER, YE. M., and KORYAKIN, V. S. O sovremennom oledeneni Severnoy Zemli [Contemporary glaciation of Severnaya Zemlya]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [News of the All-Union Geographical Society], Tom 96, Vyp. 6, 1964, p. 471-79. [Survey of current knowledge.]

## ICEBERGS. SEA, RIVER AND LAKE ICE

- CHEREPANOV, N. V. Struktura morskikh l'dov bol'shoy tolshchiny [Structure of sea ice of great thickness]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta* [Transactions of the Arctic and Antarctic Scientific Research Institute], Tom 267, 1964, p. 13-18. [Ice of drifting station SP-6 identified morphologically as ice island, but crystalline structure differs from other ice islands. English translation: Canada. Defence Research Board. Translation T448R, 1966.]
- DONN, W. L., and SHAW, D. M. The heat budgets of an ice-free and an ice-covered Arctic Ocean. *Journal of Geophysical Research*, Vol. 71, No. 4, 1966, p. 1087-93. [Estimates indicate that if ice disappeared it would not re-form.]
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## SNOW

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## ERRATA (Vol. 6, No. 44)

In the entries in ‘‘Glaciological literature’’ on p. 326 PÁLMASON, G., and THORARINSSON, S., and also in the entry on p. 328 THORARINSSON, S., the details of the journal should read *Jökull*, [Vol.] 3, Ár 14, not *Jökull*, Ár. 14, No. 3; in another entry on p. 326, SUETOVA, I. A., should read SUYETOVA, I. YE.