

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

- GROSVAL'D, M. G. Glaciological and geomorphological research in the Eurasian Arctic with special reference to the Barents Sea area. *Musk-Ox*, No. 7, 1970, p. 10-27. [General account of Soviet research.]
- KEELER, C. M. Snow and ice. *Eos. Transactions, American Geophysical Union*, Vol. 52, No. 6, 1971, p. 295-302. [General review with extensive bibliography.]
- KOSLOWSKI, G. Die WMO-Eisnomenklatur. *Deutsche Hydrographische Zeitschrift*, Jahrg. 22, Ht. 6, 1969, p. 256-67. [World Meteorological Organization revised (1967) list of ice terminology.]
- MARKOV, K. K., and others. *The geography of Antarctica*, by K. K. Markov, V. I. Bardin, V. L. Lebedev, A. I. Orlov and I. A. Suyetova. Jerusalem, Israel Program for Scientific Translations, 1970, vi, 370 p. [Includes chapters on glaciation, periglacial features, climate and geology. Translation of *Geografiya Antarktidi*. Moscow, Izdatel'stvo "Mysl", 1968.]
- MILLER, M. M. Glaciological and geological investigations on the 1965 Mount Kennedy, Yukon, expedition. *National Geographic Society Research Reports*, 1965 projects, 1971, p. 161-79. [Describes activities.]
- TUSHINSKIY, G. K., and others. Inzhenerno-glyatsiologicheskoye rayonirovaniye Sovetskogo Soyuza [Zoning of the Soviet Union from the viewpoint of engineering glaciology]. [By] G. K. Tushinskiy, Ye. S. Troshkina, N. M. Malinovskaya. *Vestnik Moskovskogo Universiteta*, Ser. 5, 26 God, [No.] 1, 1971, p. 3-7. [Distribution of ice phenomena which impinge on human activities: avalanches, glaciers, floating ice and others.]

GLACIOLOGICAL INSTRUMENTS AND METHODS

- BOGORODSKIY, V. V., and others. Radiofizicheskiye issledovaniya v Arktike i Antarktike [Radiophysical studies in the Arctic and Antarctica]. [By] V. V. Bogorodskiy, A. V. Gusev, V. A. Spitsyn. *Problemy Arktiki i Antarktiki*, Nos. 36-37, 1970, p. 160-73. [Radio echo-sounding of ice and other remote sensing techniques applicable in polar regions.]
- ISHIKAWA, M., and others. Sugi to karamatsu no keitai ni yoru sekisetsushin no suitei [Estimation of snow depth by tree forms of *Cryptomeria Japonica* and Japanese larch]. [By] M. Ishikawa, T. Kawaguchi [and] S. Satō. *Seppyo*, [Vol.] 32, [Nos.] 1-2, 1970, p. 10-17. [Depth may be estimated by relation to height of branches drooping because of weight of snow or by study of scars on trunks due to bending or breaking of branches by snow. English summary, p. 17.]
- SUGIYAMA, T. Kūchū shashin ni yoru sanchi sekisetsu no sokutei [Snow survey by aerial photography in a mountainous region]. *Seppyo*, [Vol.] 32, [No.] 3, 1970, p. 55-62. [Method used successfully in Japan. English summary, p. 62.]
- WEISS, H. V., and others. Selenium and sulfur in a Greenland ice sheet. Relation to fossil fuel composition, [by] H. V. Weiss, M. Koide, E. D. Goldberg. *Science*, Vol. 172, No. 3980, 1971, p. 261-63. [Ratio of Se to S is indication of age of sample.]
- YOSHIDA, Y. Hyōjō kara no onkyō sokushin ni tsuite [Echo-sounding [of ice-covered waters] from the surface of the ice]. *Nankyoku Shiryo: Antarctic Record*, [No.] 34, 1969, p. 14-22. [Outline of equipment and results of echo-sounding experiments on lake ice and sea ice near "Syowa" station, Antarctica.]

PHYSICS OF ICE

- ADAMSON, A. W., and others. Contact angles on molecular solids. I. Ice, by A. W. Adamson, F. P. Shirley, and K. T. Kunichika. *Journal of Colloid and Interface Science*, Vol. 34, No. 3, 1970, p. 461-68. [Data for a number of liquids on polycrystalline ice and CS₂ on basal plane of single crystal. Discussion of results in terms of whether surface is liquid-like.]
- ANTHONY, T. R., and CLINE, H. E. Thermal migration of liquid droplets through solids. *Journal of Applied Physics*, Vol. 42, No. 9, 1971, p. 3380-87. [Study of irreversible processes which occur when droplets migrate under a thermal gradient. Experiments performed on brine drops in KCl, but with applications to ice.]
- ARNOLD, G. P., and others. Neutron diffraction study of ice polymorphs under helium pressure, [by] G. P. Arnold, R. G. Wenzel, S. W. Rabideau, N. G. Nereson and A. L. Bowman. *Journal of Chemical Physics*, Vol. 55, No. 2, 1971, p. 589-95. [D₂O polymorphs studied to 3.5 kbar. Phase boundaries and compressibilities reported, also crystal structures including ice III.]
- BARNES, P., and others. Friction and creep of polycrystalline ice, by P. Barnes, D. Tabor and J. C. F. Walker. *Proceedings of the Royal Society of London*, Ser. A, Vol. 324, No. 1557, 1971, p. 127-55. [Uniaxial compression and hardness tests of a wide range of strain-rates between 0° and -48° C. Friction experiments of movement of cone of ice on hard surface. Applications to glacier flow.]

- BASSETT, D. R., *and others*. Adsorption studies on ice-nucleating substrates. Hydrophobed silicas and silver iodide, by D. R. Bassett, E. A. Boucher and A. C. Zettlemoyer. *Journal of Colloid and Interface Science*, Vol. 34, No. 3, 1970, p. 436–46. [Study of properties needed for effective heterogeneous nucleation of ice.]
- BELL, J. D., *and others*. Proton magnetic resonance evidence of a liquid phase in polycrystalline ice, by J. D. Bell, R. W. Myatt, R. E. Richards. *Nature, Physical Science*, Vol. 230, No. 12, 1971, p. 91–92. [Letter. Evidence that a small proportion of the protons are in a liquid-like state is discussed and various possible explanations are considered.]
- BEZVERKHNIY, SH. A., *and others*. Izluchatel'naya i otrazhatel'naya sposobnost' l'da v infrakrasnoy oblasti spektra [Emissivity and reflectivity of ice in the infra-red region of the spectrum]. [By] Sh. A. Bezverkhniy, M. A. Bramson, Ye. V. Moiseyeva. *Izvestiya Akademii Nauk SSSR. Fizika Atmosfery i Okeana*, Tom 6, No. 3, 1970, p. 314–17. [Computer calculation. English translation in *Izvestiya. Academy of Sciences, U.S.S.R. Atmospheric and Oceanic Physics*, Vol. 6, No. 3, 1970, p. 177–79.]
- BUNYATYAN, B. KH., *and others*. O vtorom momente linii protonnogo magnitnogo rezonansa l'da [Second moment of the proton magnetic resonance line of ice]. [By] B. Kh. Bunyatyan, D. A. Zhogolev, I. V. Matyash. *Ukrainskiy Fizicheskii Zhurnal* [Russian-language edition], Tom 15, No. 11, 1970, p. 1921–23. [Theory and experiment. Best agreement with particular molecular parameters.]
- BURGMAN, J. O. Proton dynamics in ice studied by inelastic scattering of slow neutrons. *Atompraxis*, 16. Jahrg., Ht. 5, 1970, p. 324–28. [Studies of pure and KOH-doped ice from 143 K to the melting point. Comparison of results with infra-red and Raman spectroscopy data.]
- CAMERON, J. A., *and others*. Mössbauer effect of ferrous ions in cubic ice, [by] J. A. Cameron and L. Keszthelyi, G. Nagy and L. Kacsoh. *Chemical Physics Letters*, Vol. 8, No. 6, 1971, p. 628–30. [Differential thermal analysis used to identify phase changes from ice III or ice V to ice Ic. Mössbauer measurements unaffected by presence of ice Ic.]
- CHAMBERLAIN, J. S., *and* FLETCHER, N. H. Low temperature polarization effects in ice. *Physik der kondensierten Materie*, Bd. 12, Ht. 3, 1971, p. 193–209. [Peaks in electric current observed when HF-doped ice is warmed up in an electric field. Explanation in terms of point defects in ice.]
- DAWSON, R., *and* HUTCHINSON, W. C. A. Electrification accompanying the freezing of water. *Quarterly Journal of the Royal Meteorological Society*, Vol. 97, No. 411, 1971, p. 118–23. [Study of factors affecting electrification mechanism.]
- GENADIEV, N. Freezing of water under the action of AgI at temperatures close to 0°. *Doklady Bolgarskoy Akademii Nauk*, Tom 23, No. 11, 1970, p. 1345–48. [Study of formation of grape-like deposits which, if cooled to -5° to -7° C may then act as freezing nuclei at higher temperatures.]
- GOLD, L. W. Process of failure in ice. *Canadian Geotechnical Journal*, Vol. 7, No. 4, 1970, p. 405–13. [Presents information on failure behaviour of columnar-grained ice during compressive creep and constant strain-rate tests. Describes role of crack formation in establishing failure condition.]
- GOODRICH, L. E. Review of radiation absorption coefficients for clear ice in the spectral region 0.3 to 3 microns. *Canada. National Research Council. Division of Building Research. Technical Paper No. 331*, 1970, 14 p. [Literature survey with graph of best values.]
- GUREVICH, I. I., *and others*. Dvuzhchastotnaya pretsessiya myuoniya v magnitnom pole [Two-frequency precession of muonium in a magnetic field]. [By] I. I. Gurevich [and 8 others]. *Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki*, Tom 60, Vyp. 2, 1971, p. 471–82. [Hyperfine splitting studied for muonium in, among other things, ice. English translation in *Soviet Physics—JETP*, Vol. 33, No. 2, 1971, p. 253–59.]
- HAMLET, P., *and* KEVAN, L. Optical bleaching of trapped electrons in γ -irradiated alkaline ice. Location of energy levels. *Journal of the American Chemical Society*, Vol. 93, No. 5, 1971, p. 1102–06. [Electron paramagnetic resonance study indicates shallow traps. Discussion of where de-trapped electrons go.]
- HARRIS, F. S., jr. Water and ice cloud discrimination by laser beam scattering. *Applied Optics*, Vol. 10, No. 4, 1971, p. 732–37. [Angular distribution of various polarization parameters can be used to identify ice clouds remotely.]
- HIGASHI, A., *and* FUKUDA, A. Kōri no kesshō no kōshikekkan no X-sen-teki kenkyū [Investigations of lattice defects in ice crystals by the methods of X-ray diffraction]. *Nippon Kesshō Gakkai-shi*, [Vol.] 13, [No.] 2, 1970, p. 58–67. [Review paper. Emphasis on study of asterism of Laue pattern and on use of diffraction topographs to reveal dislocations and their motion.]
- HOEKSTRA, P., *and others*. Microwave dielectric measurements on anomalous water, [by] P. Hoekstra, G. Swinow, S. Ackley, W. T. Doyle. *Nature, Physical Science*, Vol. 229, No. 3, 1971, p. 92–94. [Some samples of anomalous water show normal dielectric behaviour, others show much lower dielectric constant and dielectric loss than normal water.]
- HOLZAPFEL, W. B. Melting curve and the equation of state of ice VII in the 100 kbar range. *High Temperatures. High Pressures*, Vol. 1, No. 6, 1969, p. 675–77. [X-ray measurements on ice VII used to derive equation of state. Doubt cast on experimental melting curve of Pistorius and others.]
- HUNTER, C. E., *and* DONN, B. Effect of methane, ammonia, and silicates on the 3.07-micron ice absorption in interstellar grains. *Astrophysical Journal*, Vol. 167, No. 1, Pt. 1, 1971, p. 71–75. [Laboratory measurements show no change in absorption band positions except for silicates, and changes in relative intensities cannot explain absence of 3.07 μ m interstellar band.]
- INOUE, K. Slowing down of neutrons to very low temperatures by cold solid hydrogenous moderators. *Journal of Nuclear Science and Technology*, Vol. 7, No. 11, 1970, p. 580–87. [Neutron temperature is much higher than ice temperature when ice is very cold. Explanation in terms of mechanism of interaction between neutrons and ice.]
- JELLINEK, H. H. G., *and* CHATTERJEE, A. K. Diffusion of radioactive sodium in polycrystalline ice. *Physica Status Solidi A*, Vol. 4, No. 1, 1971, p. 173–79. [Activation energies for lattice and grain-boundary diffusion similar to those for Cs ions. Relation with other relaxation processes, and nature of grain boundaries, discussed.]

- KAMB, W. B. Hydrogen-bond stereochemistry and "anomalous water". *Science*, Vol. 172, No. 3980, 1971, p. 231-42. [General survey of theories of anomalous water shows that they are all inconsistent with existing concepts of H-bond stereochemistry.]
- KAWAMURA, T., and KUROIWA, D. Mage ni tomonau kōri no teimen-pitto no kyodō [Behaviour of etch pits on the basal plane of ice associated with bending]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 63-72. [Etching a sample immediately after bending produced etch pits and etch channels, the latter being attributed to dislocations producing non-basal slip moving under stress relaxation. Study of their velocity and direction. English summary, p. 71-72.]
- KESZTHELYI, L. Mit tudhatunk meg a jégéről magfizikai módszerekkel [What is to be learned about ice by nuclear physical methods]? *Fizikai Szemle*, 20. Évfolyam, 8. Szám, 1970, p. 242-48. [Mössbauer and nuclear magnetic resonance studies and what they tell us about frozen solutions of Fe and Ta salts.]
- KITAHARA, T., and others. Kōri no kōdo no sokutei. II. Omo ni kesshōmen ni yoru kōdo no chigai ni tsuite [Measurement of hardness of ice single crystals. II. Principally concerning hardness changes with crystal surface]. [By] T. Kitahara, T. Kawamura, T. Kobayashi. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 81-95. [Indentation hardness tests show (112̄0) plane harder than (0001) below -1° C. English summary, p. 95.]
- KOSTER, A. S. Oxygen K emission spectra of ice, solid carbon dioxide, and solid alcohols. *Applied Physics Letters*, Vol. 18, No. 5, 1971, p. 170-71. [Measurement. Comparison of results with electron spectroscopy data.]
- KVAJIĆ, G., and BRAJČIĆ, V. Anisotropy of growth of polycrystalline ice in constitutionally supercooled water. *Canadian Journal of Physics*, Vol. 49, No. 14, 1971, p. 1861-64. [Observations of encroachment of crystals of differing orientation as ice grows and discussion of mechanism.]
- LOCK, G. S. H., and NYREN, R. H. Analysis of fully-developed ice formation in a convectively-cooled circular tube. *International Journal of Heat and Mass Transfer*, Vol. 14, No. 6, 1971, p. 825-34. [Theoretical analysis.]
- MAENO, N. Enka-kariumu-hyō no yūden-bunsan. I. Kōon-ryōiki ni okeru yūden-bunsan.—II. Teion-ryōiki ni okeru yūden-bunsan [The dielectric dispersion of KCl ice. I. Dielectric dispersion in the high temperature region.—II. Dielectric dispersion in the low temperature region]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 1-15, 17-22. [Two papers reporting results above and below the eutectic temperature. English summaries p. 14-15, 22.]
- MAENO, N. Kōri no naibu-yūkai to hyōmen-yūkai no kansatsu [Observations of internal and surface melting of ice]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 23-31. [Study of nuclei for Tyndall figures, wave-length necessary for Tyndall figure formation and mode of surface melting under radiant heat. English summary, p. 30-31.]
- MAJBOUBE, M. Fractionnement en ¹⁸O entre la glace et la vapeur d'eau. *Journal de Chimie Physique et Physicochimie Biologique*, Tom. 68, No. 4, 1971, p. 625-36. [Measurement of fractionation factor of ¹⁸O between ice and water vapour.]
- MARTIN, D. H. Experimental studies of a low-pressure air-water vapor-ice system. *Journal of Vacuum Science and Technology*, Vol. 7, No. 3, 1970, p. 434-39. [Study of evaporation of ice at low air pressures and of resulting ice temperature.]
- MICHAELI, G. Propagation kinetics of steps growing on the basal plane of ice crystals. *Nature, Physical Science*, Vol. 230, No. 13, 1971, p. 117-18. [Sharp phase transition in ice surface observed at 264-271 K explained by formation of interfacial water layer.]
- MINTON, A. P. The far-ultraviolet spectrum of ice. *Journal of Physical Chemistry*, Vol. 75, No. 8, 1971, p. 1162-64. [Measurements from 180 to 186 nm show results less like liquid water than expected.]
- MITZDORF, U., and HELMREICH, D. Elastic constants of D₂O ice and variation of intermolecular forces on deuteration. *Journal of the Acoustical Society of America*, Vol. 49, No. 3, Pt. 2, 1971, p. 723-28. [Measurement of single crystal elastic stiffnesses of D₂O between 0° and -140° C and deduction of molecular force constants.]
- MOGENSEN, O., and others. Angular correlation of annihilation photons in ice single crystals, by O. Mogensen, G. Kvajić, M. Eldrup, and M. Milošević-Kvajić. *Physical Review B*, Third Ser., Vol. 4, No. 1, 1971, p. 71-73. [Narrow central peak and side peaks observed. All attributed to parapositronium annihilation, the side peaks showing positronium is delocalized in ice.]
- NEVSKIY, A. S., and MALYSHEVA, A. I. Massoobmen i teploperedacha pri plavlenii l'da v rastvorakh soley [Mass and heat transfer during the melting of ice in salt solutions]. *Inzhenerno-Fizicheskii Zhurnal*, Tom 19, Vyp. 4, 1970, p. 652-58. [Mass and heat transfer coefficients determined under various convection and bubbling conditions. English summary, p. 658.]
- PAREN, J. G., and WALKER, J. C. F. Influence of limited solubility on the electrical and mechanical properties of ice. *Nature, Physical Science*, Vol. 230, No. 12, 1971, p. 77-79. [Effect of impurities forming a second phase on the properties of ice is discussed.]
- PICK, M. A., and others. The specific heat of pure and doped ice near 120° K, [by] M. A. Pick, H. Wenzl and H. Engelhardt. *Zeitschrift für Naturforschung*, Bd. 26A, Ht. 5, 1971, p. 810-14. [Anomaly observed that suggests a partial ordering of hydrogen below this temperature.]
- PISLER, E., and ATKINSON, W. R. Atmospheric electrical discharges in the presence of water and ice particles. *Journal of Geophysical Research*, Vol. 76, No. 12, 1971, p. 2805-24. [Photographic examination of various electrical discharges involving water or ice in simulation of thunder-storm environment.]
- RAMSEIER, R. O. Mechanical behaviour of ice at high temperature. *Bulletin of the American Physical Society*, Ser. 2, Vol. 15, No. 6, 1970, p. 812. [Abstract only. Constant stress and constant strain-rate tests on ice of different textures from -35° C to -1.5° C.]
- RASMUSSEN, D. H., and MACKENZIE, A. P. The glass transition in amorphous water. Application of the measurements to problems arising in cryobiology. *Journal of Physical Chemistry*, Vol. 75, No. 7, 1971, p. 967-73. [Values for glass transition temperature of aqueous solutions of glycerol, ethylene glycol, and methanol, measured by differential thermal analysis, were extrapolated to obtain values for amorphous water.]

- ROGERSON, J. E., and CHAYT, G. A. Total melting time in the ablating slab problem. *Journal of Applied Physics*, Vol. 42, No. 7, 1971, p. 2711-13. [Exact theoretical solution for time to melt a slab when melted material is immediately removed.]
- SATŌ, N., and KOBAYASHI, T. Yōka-gin to yōka ammonia de kegasareta kōri no hyōmen ni arawareru kaidan-teki seichō [Growth steps on a surface contaminated with AgI and NH₄I particles]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 73-80. [High growth steps observed on basal surfaces of ice growing from vapour if both AgI and NH₄I are present, but not with either by itself. English summary, p. 80.]
- SESSELMANN, I., and HELMREICH, D. Einfluss von Fehlstellen und Verunreinigungen auf den Ordnungs-Unordnungs-Übergang im hexagonalen Eis Ih. *Zeitschrift für Naturforschung*, Bd. 26A, Ht. 5, 1971, p. 803-09. [Measurements of elastic constant c_{33} in pure and HF-doped D₂O ice show an anomaly in the doped ice below 150 K opposite in sign from that found for H₂O ice.]
- SHIBA, K., and TANGE, S. Seppyō no gansui-ritsu no sokutei [Measurement of the free water content of snow or ice]. *Ōyō Butsurī*, [Vol.] 39, [No.] 12, 1970, p. 1101-05. [Apparatus for measuring free water content based on fact that apparent mass in water at 0° C depends on moisture content. English summary, p. 1101.]
- SUZUKI, S. Kōri no bikesshō no sodaika ni kansuru kenkyū. II.—III [Study of grain coarsening of microcrystals of ice. II.—III]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 33-45, 47-61. [Grain growth of ice on a glass slide. II deals with changes during grain growth and HF impurities left at original grain boundaries. III reports three methods of measuring grain-boundary energy. English summaries, p. 44-45, 60-61.]
- TAKAHASHI, T., and WAKAHAMA, G. Tōki ni okeru Mendenhōru-hyōga-chōsa. Hyōgahyō no denki-dendōdo no sokutei. Hyōga-naibu no mizu no zonzai [A study of Mendenhall Glacier ice in winter. Measurement of electrical conductivity of glacier ice. Existence of liquid water in the temperate glacier]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 105-11. [Conductivity of glacier ice single crystals. Coefficient of permeability also deduced. English summary, p. 111.]
- TANKIN, R. S., and FARHADIEH, R. Effects of thermal convection currents on formation of ice. *International Journal of Heat and Mass Transfer*, Vol. 14, No. 7, 1971, p. 953-61. [Interferometer used to obtain isotherms in liquid and hence deduce convection pattern. Critical Rayleigh number for freezing from below deduced.]
- THOMAS, R. H. Flow law for Antarctic ice shelves. *Nature, Physical Science*, Vol. 232, No. 30, 1971, p. 85-87. [Data on spreading of ice shelves used to deduce steady-state flow law of ice down to 0.04 MN m⁻².]
- UNWIN, P. N. T., and MUGURUMA, J. Transmission electron microscopy of ice. *Journal of Applied Physics*, Vol. 42, No. 9, 1971, p. 3640-41. [Method of producing specimens and observation of cavities in the ice. Explanation of their formation by irradiation damage and of their migration. Evidence for dislocations, including partial dislocations.]
- USHAKOVA, L. A., and others. O vozmozhnosti sushchestvovaniya kvazizhidkoy plenki na poverkhnosti ledyanykh kristallov pri otritsatel'nykh temperaturakh [Possible existence of a quasi-liquid film on the surface of ice crystals at sub-zero temperatures]. [By] L. A. Ushakova, V. I. Kvilvidze, A. A. Sklyankin. (In Kiselev, V. F., and Kvilvidze, V. I., ed. *Soyazannaya voda v dispersnykh sistemakh [Bonded water in disperse systems]*, Vyp. 1. [Moscow], Izdatel'stvo Moskovskogo Universiteta, 1970, p. 155-66.) [Review of surface properties of ice. Proposals for determining structure and properties of quasi-liquid layer.]
- VALIC, M. I., and others. Strong collision limit of spin-lattice relaxation in hexagonal ice, [by] M. I. Valic, S. Gornostansky and M. M. Pintar. *Chemical Physics Letters*, Vol. 9, No. 4, 1971, p. 362-64. [Measurement shows minimum in relaxation time-temperature relation, also anisotropy.]
- VANIER, C. R., and TIEN, C. Thermal free convection from an ice sphere in water. *Applied Scientific Research*, Vol. 21, No. 5, 1969, p. 387-88. [Letter. Comments on paper by J. Schenk and F. A. M. Schenkels, *ibid.*, Vol. 19, No. 5, 1968, p. 465-76, and reply by Schenk and Schenkels.]
- WYARD, S. J. Measurement by electron spin resonance spectroscopy of local concentrations of radiation-produced radicals. (In Adams, G. E., and others, ed. *Charged particle tracks in solids and liquids. Proceedings of the second L. H. Gray conference . . . held at Cambridge, April 1969. Editors: G. E. Adams, G. K. Bewley, J. W. Boag.* London, Institute of Physics and the Physical Society, [c1970], p. 86-92. (Institute of Physics and the Physical Society Conference Series, No. 8.)) [Review of work on radicals produced by irradiation in, among other things, alkaline, acidic and H₂O₂ doped ice.]
- ZIMBRICK, J. D., and MYERS, L. S., jr. EPR studies on trapped species produced in the gamma radiolysis of aqueous sugar ices. *Journal of Chemical Physics*, Vol. 54, No. 7, 1971, p. 2899-909. [Studies on H₂O and D₂O ices of trapped electrons and sugar radicals.]
- ZOLOTAREV, V. M. Opticheskiye postoyannyye l'da I v shirokoy infrakrasnoy oblasti spektra [Optical states of ice I in the far infra-red spectral region]. *Optika i Spektroskopiya*, Tom 29, Vyp. 6, 1970, p. 1125-28. [Modified method of calculating optical constants from transmittance and reflection data.]

LAND ICE. GLACIERS. ICE SHELVES

- ALIVERTI, G. "Surges" dei ghiacciai della regione alpina. *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 18, 1970, p. 35-41. [Glacier surges discussed; suggests glacier waves occurring on tongue of Ghiacciaio del Lys may indicate surge.]
- ÁRNASON, B. Tívvetni í grunnvatni og joklum á Íslandi. *Jökull*, [Vol.] 3, Ár 18, 1968, [pub.] 1969, p. 337-49. [Deuterium measurements in ground water and glacier ice and potential use of results. English summary, p. 349.]
- BELLONI, S. Il bilancio idrologico delle Vedrette del San Giacomo. *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 18, 1970, p. 19-34. [Results of studies on the hydrological balance of the glaciers of San Giacomo area presented and discussed.]

- BELLONI, S. Nota preliminare sulle ricerche lichenometriche nell'alveo vallivo del Ghiacciaio dei Forni. *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 18, 1970, p. 43–50. [Lichenometric measurements on moraines in the Forni valley, compared with the position of the front of Ghiacciaio dei Forni from 1833 to present day, enable conclusions to be made about the position of this glacier in the last 3 000 years.]
- BOROVIK, E. S., and KRAVTSOVA, V. I. Basseyny rek Malki, Baksana [Basins of the rivers Malka and Baksan]. *Katalog lednikov SSSR [Catalogue of glaciers of the U.S.S.R.]*, Tom 8, Chast' 5. Leningrad, Gidrometeorologicheskoye Izdatel'stvo, 1970. 148 p. [Part of the I.H.D. catalogue of glaciers of the U.S.S.R. giving details of what is known of the glaciers in this part of the northern Caucasus. The Tom number corresponds with that of *Resursy poverkhnostnykh vod SSSR [Surface water resources of the U.S.S.R.]*]
- BURTHAY EXPLORATION GROUP. The lake Hullett basin, Narssarsuaq, S.W. Greenland. *Brathay Exploration Group. Expedition Fieldwork Report*, No. 10, 1969, 92 p. [Includes survey of glaciers in area and study of ice-dammed lake Hullett.]
- BUDD, W. F., and others. Reinterpretation of deep ice temperatures, [by] W. F. Budd, D. Jenssen, U. Radok. *Nature, Physical Science*, Vol. 232, No. 30, 1971, p. 84–85. [Computer calculations of temperature profiles used to fit "Camp Century", Greenland, data and to deduce rate of surface temperature change.]
- DEMERS, J., ed. *Glaciers. Proceedings of the Workshop Seminar sponsored by Canadian National Committee for the International Hydrological Decade and assisted by University of British Columbia, September 24 and 25, 1970*. Ottawa, Secretariat, Canadian National Committee for the International Hydrological Decade, [1971]. vii, 61 p. [Contains the following papers: O. H. Løken, "Glacier studies in the Canadian IHD program", p. 1–4; A. D. Stanley, "Combined balance studies at selected glacier basins in Canada", p. 5–9; G. Young, "Mass balance measurements related to surface geometry on Peyto Glacier, Alberta", p. 11–20; G. Hattersley-Smith, "The regime of the Ward Hunt Ice Shelf and of the ice in the mouth of Nansen Sound, Ellesmere Island", p. 21–22; S. Ommanney, "The Canadian glacier inventory", p. 23–30; W. H. Mathews, "The hydrology of glaciers", p. 31–32; L. Derikx and H. Loijens, "Hydrology of glacierized basins—summary of research by Glaciology Subdivision", p. 33–35; A. Ohmura, "Experimental studies on glacier climatology—especially for the melt-climate relationships", p. 37; B. Goodison, "The relation between ablation and global radiation over Peyto Glacier, Alberta", p. 39–42; W. S. B. Paterson, "The application of ice physics to glacier studies", p. 43–46; G. K. C. Clarke, "Temperature measurements in Fox Glacier, Yukon Territory", p. 47–48; H. R. Krouse, "Application of isotope techniques to glacier studies", p. 49–59.]
- EKMANN, S. R. Seismic investigations on the Nordaustlandet ice caps. *Geografiska Annaler*, Vol. 53A, No. 1, 1971, p. 1–13. [Results of measurements on Svalbard ice caps, Austfonna and Vestfonna.]
- FREYSTEINSON, S. Tungnárijökull. *Jökull*, [Vol.] 3, Ár 18, 1968, [pub.] 1969, p. 371–88. [Profile measurements on outlet glacier of western Vatnajökull, 1959–67. Describes fluctuations since 1889. English summary, p. 386–87.]
- GERHOLD, N. Die Moränen im Bereich der Vereinshütten in den westlichen Ötztaler Alpen. (In Schöning, M., ed. *Festschrift zur Hundertjahrfeier der Sektion Frankfurt des Deutschen Alpenvereins (1869–1969)*. Frankfurt a. M., Deutscher Alpenverein, Sektion Frankfurt a. M., [1969], p. 34–40.) [Describes some glaciers and their moraines in Austria.]
- GOW, A. J. Relaxation of ice in deep drill cores from Antarctica. *Journal of Geophysical Research*, Vol. 76, No. 11, 1971, p. 2533–41. [Cores from 2 164 m depth displayed considerable relaxation 16 months after retrieval. Greatest relaxation (0.6% expansion) from 800 m depth.]
- HOINKES, H. C. Ergebnisse des glazial-meteorologisch-hydrologischen IHD-Programmes im Rofental bei Vent 1964–1968. *Österreichische Wasserwirtschaft*, Jahrg. 22, Ht. 5–6, 1970, p. 101–13. [Results of mass balance studies on Hinterreis- and Kesselwandferner. Hydrological implications.]
- HOLLIN, J. T. Antarctic ice surges. *Antarctic Journal of the United States*, Vol. 5, No. 5, 1970, p. 155–56. [Support of theory that ice ages were caused by surges of the Antarctic ice sheet, injecting vast quantities of ice into the world's oceans.]
- HUGHES, T. Convection in polar ice sheets as a model for convection in the Earth's mantle. *Journal of Geophysical Research*, Vol. 76, No. 11, 1971, p. 2628–38. [Thermal convection might be an important flow mechanism in polar ice sheets.]
- KAMB, W. B. Sliding motion of glaciers: theory and observation. *Reviews of Geophysics and Space Physics*, Vol. 8, No. 4, 1970, p. 673–728. [Comprehensive review of sliding motion of glacier ice, with particular reference to motion over bedrock of various roughnesses.]
- KUROIWA, D. Noruwee no Nigardsbreen yori hōshutsu sareta hyōgasa to shiruto no hyōmen-kōzō to kōbutsuseibun ni suite [Surface topography and mineral compositions of silt and sand discharged from Nigardsbreen in Norway]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 97–104. [Describes composition of samples taken from the bottom of the river discharging from the glacier, and from the surface of sediments in the glacier lake. English summary, p. 103.]
- LANG, H. Über den Abfluss vergletscherter Einzugsgebiete und seine Beziehung zu meteorologischen Faktoren. *Mitteilungen der Versuchsanstalt für Wasserbau und Erdbau an der Eidgenössischen Technischen Hochschule in Zürich*, Nr. 85, 1970, p. 31/1–31/9. [Run-off in drainage basins of Aletsch- and Roseggletscher analysed in relation to meteorological factors.]
- LESICA, C. Impiego della fotogrammetria per il rilievo aree glaciali. *Bollettino della Società Italiana di Fotogrammetria e Topografia*, No. 1, 1970, p. 35–51. [Describes photogrammetric means for studying relief of glaciers, with particular reference to Ghiacciaio della Tribolazione.]
- LLIBOUTRY, L. A. Les catastrophes glaciaires. *La Recherche*, No. 12, 1971, p. 417–25. [Some general features of glaciers are described as well as surging and similar catastrophic movements.]
- LLIBOUTRY, L. A. Physique des glaciers. (In Goguel, J., ed. *Géophysique*. Paris, Librairie Gallimard, 1971, p. 960–1026. (Encyclopédie de la Pléiade.)) [Comprehensive survey of properties of glaciers.]

- MELANDER, O. Sulitelmas glaciärer. *Till Fjälls*, Årg. 41-42, 1969-70, p. 116-23. [Surveys study of glaciers in Swedish part of mountain of Sulitelma, north Sweden, from nineteenth century to present day.]
- MILLER, M. M. The Alaskan Glacier Commemorative Project, phase II. *National Geographic Society Research Reports*, 1965 projects, 1971, p. 181-94. [Second year of a programme to study changes in glaciers in southern Alaska for comparison with studies of Tarr and Martin, 1909-13.]
- MORGAN, P. J. Ice surface movement in Marie Byrd Land. *Ohio State University. Institute of Polar Studies. Report No. 38*, 1970, vi, 43 p. [Photogrammetric re-triangulation of markers placed in 1962 and triangulated in 1963. Problems discussed.]
- NYE, J. F. Causes and mechanics of glacier surges: discussion. *Canadian Journal of Earth Sciences*, Vol. 8, No. 2, 1971, p. 306-07. [Remarks presented during discussion prior to summary presentation by M. F. Meier at St. Hilaire, Quebec, 12 September 1968 (see *ibid.*, Vol. 6, No. 4, Pt. 2, 1969, p. 987).]
- PELZL, E. Schelfeis oder Eisschelf, Dezennium oder Dekade? *Erdkunde*, Bd. 25, Ht. 1, 1971, p. 65. [Discussion about terminology.]
- PETERSON, D. N. Glaciological investigations on the Casement Glacier, southeast Alaska. *Ohio State University. Institute of Polar Studies. Report No. 36*, 1970, xi, 161 p. [Includes ice movement, mass budget and ablation studies; ice thickness determinations; englacial velocity profiles; and ice tunnel and heat balance studies.]
- PRICE, R. J. The University of Glasgow Breiðamerkjökull project (1964-67); a progress report. *Jökull*, [Vol.] 3, År 18, 1968, [pub.] 1969, p. 389-93. [Reports 1965 and 1966 field work, aiming to produce maps of glacier, measure ice wastage and study changes in proglacial area.]
- RIST, S. Jöklabreytingar 1965/66, 1966/67 og 1967/68. *Jökull*, [Vol.] 3, År 18, 1968, [pub.] 1969, p. 401-05. [Table of variations in Icelandic glaciers, 1965-68.]
- RÖTHLISBERGER, H., and AELLEN, M. Bewegungsregistrierung an der Zunge des Gétrogletschers. *Schweizerische Bauzeitung*, 88. Jahrg., Ht. 43, 1970, p. 981-86. [Method described for recording movement at snout of Gétrogletscher for early detection of surge. Also published in *Mitteilungen der Versuchsanstalt für Wasserbau und Erdbau an der Eidgenössischen Technischen Hochschule in Zürich*, Nr. 85, 1970, p. 33/1-33/6.]
- SHCHETINNIKOV, A. S., and PODKOPAYEVA, L. D. Reka Pskem [River Pskem]. *Katalog lednikov SSSR [Catalogue of glaciers of the U.S.S.R.]*, Tom 14, Vyp. 1, Chast' 1. Leningrad, Gidrometeorologicheskoye Izdatel'stvo, 1968. 48 p. [Part of the I.H.D. catalogue of glaciers of the U.S.S.R. giving details of what is known of the glaciers in the basin of the Syr-Dar'ya. The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR [Surface water resources of the U.S.S.R.]*.]
- SKODA, G. Die Bestimmung der Massenbilanz temperierter Gletscher. *Wetter und Leben*, Jahrg. 23, Ht. 1-2, 1971, p. 15-22. [Methods of determining mass balance of temperate glaciers compared and discussed.]
- THEAKSTONE, W. H., and others. Glacier studies in Nordland, Norway, 1970, [by] W. H. Theakstone, K. S. Stelzer, N. T. Knudsen. *Aarhus Universitet. Geografisk Institut. Laboratoriet for Fysisk Geografi. Skrifter i Fysisk Geografi*, No. 1, 1970, 96 leaves + corrigenda slip, 39 maps and plates + corrigenda slip in separate vol. (Okstindan Research Project, Report No. 1.) [Main aim to provide foundation for future study of mass balance of Charles Rabots Bre and to begin compilation of photogrammetric record of Okstindan glaciers.]
- THEODÓRSSON, P. Prívetni í grunnvatni og jöklum á Íslandi. *Jökull*, [Vol.] 3, År 18, 1968, [pub.] 1969, p. 350-58. [Tritium measurements in bore holes in Langjökull and Vatnajökull showed extensive isotope exchange between rain and melt water on one hand and glacier ice on the other. English summary, p. 358.]
- THORARINSSON, S. The effect of glacier changes in Iceland resulting from increase in the frequency of drift ice years. *Jökull*, År 19, 1969, [pub.] 1970, p. 103. [Summary. Lists consequences of general advance of Icelandic glaciers.]
- THORARINSSON, S. Vatnajökulsleidangur 1968 1.-14. júní. *Jökull*, [Vol.] 3, År 18, 1968, [pub.] 1969, p. 394-400. [Icelandic expedition to Vatnajökull, 1968, obtained samples of firn and ice for determination of deuterium and tritium content. English summary, p. 400.]
- VIVIAN, R., and VÖLLE, L. Fiches des glaciers français. Les glaciers du Mont de Lans et de la Girose. *Revue de Géographie Alpine*, Tom. 58, [Fasc.] 4, 1970, p. 689-92. [Summary of knowledge of these French glaciers.]
- ZANON, G. Studi sul bilancio di massa del Ghiacciaio del Caresèr (Alpi Centrali). Risultati per le annate 1966-67 e 1967-68. *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 18, 1970, p. 11-17. [Results of mass balance investigations on Ghiacciaio del Caresèr, Italian Alps.]

ICEBERGS. SEA, RIVER AND LAKE ICE

- AOTA, M., and others. Rēdā kansoku ni yoru Hokkaidō Ohōtsuku engan-oki no ryūhyō bumpu [Distribution of drifting ice in the Sea of Okhotsk off Hokkaido island observed with sea ice radar network—January–April 1970]. [By] M. Aota, M. Ōi, M. Ishikawa [and] H. Fukushi. *Teion-kagaku: Low Temperature Science*, Ser. A, [Supplement to No.] 28, *Shiryō Shū: Data Report*, 1970, p. 43-79.
- BERGTHÓRSSON, P. An estimate of drift ice and temperature in Iceland in 1 000 years. *Jökull*, År 19, 1969, [pub.] 1970, p. 94-101. [Period from A.D. 930. Based on correlation between temperature and incidence of drift ice and on correlation between these and frequency of severe years.]
- BERGTHÓRSSON, P. Forecasting drift ice at Iceland by means of Jan Mayen air temperature. *Jökull*, År 19, 1969, [pub.] 1970, p. 44-52. [Study of published records for last 50 years reveals close correlation between summer and autumn air temperatures in Jan Mayen and drift ice off Iceland in the following year.]
- BJÖRNSSON, H. Sea ice conditions and the atmospheric circulation north of Iceland. *Jökull*, År 19, 1969, [pub.] 1970, p. 11-17. [Data for 1965-68 indicate that intensification of Barents Sea low corresponds to bad ice conditions in north Icelandic waters and intensification of Icelandic low to good conditions.]
- BROCHU, M. Le processus de déglacement du fjord de Maricourt au Nouveau-Québec: description et interprétation. *Revue de Géographie de Montréal*, Vol. 25, No. 1, 1971, p. 43-52. [Ice break-up described, 1963.]

- DAYTON, P. K., and MARTIN, S. Observations of ice stalactites in McMurdo Sound, Antarctica. *Journal of Geophysical Research*, Vol. 76, No. 6, 1971, p. 1595-99. [Lengths of 1.5-6.0 m, diameters of 10-25 cm, growing under pack ice. Physical significance to natural desalination of sea ice and to formation of Antarctic bottom water discussed.]
- EINARSSON, T. The ice in the North Polar basin and in the Greenland Sea, and the general causes of occasional approach of the ice to the coast of Iceland. *Jökull*, ÁR 19, 1969, [pub.] 1970, p. 2-6. [Main cause of increase in ice in Icelandic waters considered to be weather conditions near Iceland.]
- ENDŌ, Y. Padoru no keisei kara shōmetsu made [Puddles observed on sea ice from the time of their appearance to that of their disappearance in Antarctica]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 203-13. [Description of puddles, and discussion of development and disappearance. English summary, p. 211-13.]
- FLETCHER, J. O. Probing the secrets of Arctic ice. *Naval Research Reviews*, Vol. 24, No. 3, 1971, p. 9-24. [Aims of AIDJEX (Arctic Ice Dynamics Joint Experiment) project are outlined.]
- FREYSTEINSSON, S. Water temperature and heat balance of rivers. *Jökull*, [Vol.] 3, ÁR 18, 1968, [pub.] 1969, p. 359-70. [Equations for water temperature in rivers and rate of heat loss from river surface discussed and used to calculate production of frazil ice in Þjórsá river, Iceland.]
- FRIDRIKSSON, S. The effects of sea ice on flora, fauna, and agriculture. *Jökull*, ÁR 19, 1969, [pub.] 1970, p. 146-57. [Ice serving as a bridge for immigration of plants and animals; influence of ice on climate and thus on grass growth and agriculture.]
- GOLD, L. W., and KRAUSZ, A. S. Investigation of the mechanical properties of St. Lawrence River ice. *Canadian Geotechnical Journal*, Vol. 8, No. 2, 1971, p. 163-69. [Results of observations on stress-strain behaviour at $-9.5 \pm 0.5^\circ\text{C}$ of 4 types of ice from river.]
- HOLDSWORTH, G. Calving from Ward Hunt Ice Shelf, 1961-1962. *Canadian Journal of Earth Sciences*, Vol. 8, No. 2, 1971, p. 299-305. [Massive calving event probably occurred between 6 February and 6 March 1962 and was due to coincidence of seismic, tidal and, possibly, meteorological conditions.]
- JAKOBSSON, J. Winds and ice drift north of Iceland, especially in the year 1965. *Jökull*, ÁR 19, 1969, [pub.] 1970, p. 69-76. [Observations favour opinion that ice concentrations in Icelandic waters in 1965 were due to unusually strong westerly winds north of Iceland.]
- JÓNSSON, B. H. Sea ice in satellite pictures. *Jökull*, ÁR 19, 1969, [pub.] 1970, p. 62-68. [ESSA satellite pictures show outflow of ice from Arctic basin between Svalbard and Greenland. Possibility discussed of forecasting ice movements.]
- KARLSSON, T. Sea ice drift in the East-Greenland Current. *Jökull*, ÁR 19, 1969, [pub.] 1970, p. 53-61. [Equations for calculating ice drift and ice concentration.]
- KELLEY, J. J., jr., and HOOD, D. W. Carbon dioxide in the surface water of the ice-covered Bering Sea. *Nature*, Vol. 229, No. 5279, 1971, p. 37-39. [Water in leads and polynyi was supersaturated with CO_2 with respect to air, the magnitude of the supersaturation being relatively constant over a wide area of the sea ice pack.]
- MALMBERG, S.-A. Hydrographic changes in the waters between Iceland and Jan Mayen in the last decade. *Jökull*, ÁR 19, 1969, [pub.] 1970, p. 30-43. [Influence of salinity and temperature changes in East Icelandic Current on drift ice conditions in Icelandic waters.]
- MANSIKKANIEMI, H. Ice-push action on sea shores, south-eastern Finland. *Turun Yliopiston Maantieteen Laitoksen Julkaisuja*, No. 50, 1970, 30 p. [Old signs of ice thrust and present action observed on shore of Gulf of Finland. Measurements of strength of thrust made.]
- ONO, N., and ISHIDA, T. Ryūhyō jōkyō to rēdā-zō no taiō. II [On the correlation of sea ice construction to radar patterns. II]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 281-89. [Discusses discrepancy between apparent widths of leads in radar photographs and actual width, shown in charts drawn from air photographs. English summary, p. 288-89.]
- RIST, S. Lake-ice of Mývatn. *Jökull*, ÁR 19, 1969, [pub.] 1970, p. 121-27. [Observations of local farmer, 1932-69.]
- SHELL, I. I. Arctic ice and sea temperature anomalies in the northeastern North Atlantic and their significance for seasonal foreshadowing locally and to the eastward. *Monthly Weather Review*, Vol. 98, No. 11, 1970, p. 833-50. [Analysis made of a combined 6 years with an extreme northerly ice limit and relatively high sea temperatures and 6 years with an extreme southerly ice limit and relatively low sea temperatures during April-September and a relationship found between that and the contemporary and subsequent October-March air temperatures and precipitation locally and to the eastward.]
- SIGFÚSDÓTTIR, A. B. Temperature in Stykkishólmur 1846-1968. *Jökull*, ÁR 19, 1969, [pub.] 1970, p. 7-10. [Results from weather station on coast of western Iceland. Relation of temperature to occurrence of sea ice discussed briefly.]
- SIGURDSSON, F. H. Report on sea ice off the Icelandic coasts, October 1967 to September 1968. *Jökull*, ÁR 19, 1969, [pub.] 1970, p. 77-93. [More drift ice observed than in any year since 1888.]
- SPENCE, E. S. An empirical approach to time of freeze-up analysis. *Albertan Geographer*, No. 7, 1971, p. 6-11. [Relationship established between time of ice formation and the hydraulic variables of stream depth, stream velocity, and distance from the nearest bank.]
- TABATA, T. Rēdā ni yoru ryūhyō kansoku. II [Observations of drift ice movement by the sea ice radar network. II]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 301-10. [Results of observations from the Sea of Okhotsk. English summary, p. 309-10.]
- TSURIKOV, V. L. Formirovaniye i izmeneniye solenosti morskogo l'da [Formation and change of salinity in sea ice]. (In Bruyevich, S. V., ed. *Khimicheskkiye resursy morey i okeanov* [Chemical resources of the seas and oceans]. Moscow, Izdatel'stvo "Nauka", 1970, p. 3-11.)
- VOLKOV, N. A., and others. Osnovnyye itogi zadachi razrabotki metodiki dolgosrochnykh ledovykh prognozov dlya arkticheskikh morey [Main results and tasks in working out methods of long-range ice forecasts for Arctic

- seas]. [By] N. A. Volkov, Z. M. Gudkovich, A. A. Kirillov, Ye. G. Kovalev, A. V. Smetannikova, V. A. Spichkin. *Problemy Arktiki i Antarktiki*, Nos. 36–37, 1970, p. 86–106. [Recent Soviet work.]
- WEBER, J. R., and LILLESTRAND, R. L. Measurement of tilt of a frozen sea. *Nature*, Vol. 229, No. 5286, 1971, p. 550–51. [Accurate hydrostatic levelling system developed and tested near the North Pole and in the Gulf of St. Lawrence. Results presented.]
- WILLIAMS, G. P. Predicting the date of lake ice breakup. *Water Resources Research*, Vol. 7, No. 2, 1971, p. 323–33. [Investigation of accuracy with which actual date of break-up can be predicted by using past break-up and air temperature records and current weather information from meteorological stations.]
- GLACIAL GEOLOGY
- AALTO, K. R. Glacial marine sedimentation and stratigraphy of the Toby Conglomerate (Upper Proterozoic), southeastern British Columbia, northwestern Idaho and northeastern Washington. *Canadian Journal of Earth Sciences*, Vol. 8, No. 7, 1971, p. 753–87. [Detailed study of conglomerate shows it was deposited largely by sub-aqueous mudflows and submarine glacial wasting, thus supporting theory of world-wide occurrence of a Late Pre-Cambrian ice age.]
- AARIO, R. Consolidation of Finnish sediments by loading ice sheets. *Bulletin of the Geological Society of Finland*, No. 43, Pt. 1, 1971, p. 55–65. [Effect of over-riding ice sheets during previous glaciations on clays.]
- AARTOLAHTI, T. Etelä-Suomen lounikoista [Boulder fields in southern Finland]. *Terra*, Vuosikerta 83, No. 2, 1971, p. 74–80. [Discusses morphology, structure, situation, genesis and regional distribution. English summary, p. 74.]
- ALHONEN, P. Vatulanharjun geologiaa [The geology of the Vatulja esker, south-west Finland]. *Terra*, Vuosikerta 83, No. 2, 1971, p. 81–86. [Discusses structure and formation. English summary, p. 81.]
- ANDERSEN, J. L., and SOLLID, J. L. Glacial chronology and glacial geomorphology in the marginal zones of the glaciers Middalsbreen and Nigardsbreen, south Norway. *Norsk Geografisk Tidsskrift*, Bd. 25, Ht. 1, 1971, p. 1–38. [Glacial and fluvio-glacial erosion and deposition. Lichenometry used to determine outer limits of marginal zones and to date moraine ridges.]
- ANDREWS, J. T. *A geomorphological study of post-glacial uplift with particular reference to Arctic Canada*. London, Institute of British Geographers, [c1970]. xxi, 156 p. (Institute of British Geographers. Special Publication No. 2.) [By analysis of data obtained from recent research on glacio-isostatic recovery in this area, the author reconstructs the post-glacial uplift, emergence and crustal deformation of areas varying in size from local to continental.]
- AUER, V. The Pleistocene of Fuego-Patagonia. Part V: Quaternary problems of southern South America. *Annales Academiae Scientiarum Fennicae*. Ser. A, 3, Geologica-Geographica, Tom. 100, 1970, 194 p. [Extensive review of literature on movements and distribution of ancient and present-day glaciers, and on periglacial phenomena, in this region. Climatic variation and shore-line displacement investigated by means of tephrochronology and pollen analysis.]
- BROCHU, M. Existence possible d'une zone périglaciaire actuelle et d'une zone glaciaire Pléistocène à la partie sommitale du Pico do Fogo dans l'archipel du Cap Vert. *Revue de Géographie de Montréal*, Vol. 25, No. 1, 1971, p. 95–97. [Suggests summit of this mountain in the Azores was glaciated during the Pleistocene.]
- CAILLEUX, A. Lacs en ourson, cernes et thermokarst. *Cahiers de Géographie de Québec*, 15^e An., No. 34, 1971, p. 131–36. [Describes these Canadian lakes of glacial origin, and suggests mode of formation.]
- CHAPMAN, R. J. The late-Weichselian glaciations of the Erne Basin. *Irish Geography*, Vol. 6, No. 2, 1970, p. 153–61. [Study of direction of flow and conclusions concerning ice sheet in this part of Ireland.]
- CRAWFORD, A. R., and DAILY, B. Probable non-synchronicity of Late Precambrian glaciations. *Nature*, Vol. 230, No. 5289, 1971, p. 111–12. [Evidence presented and discussed in favour of hypothesis that world-wide synchronicity of Late Pre-Cambrian glaciation is unlikely.]
- DOORNKAMP, J. C., and KING, C. A. M. *Numerical analysis in geomorphology: an introduction*. London, Edward Arnold, [c1971]. xi, 372 p. [Deals with drainage basins, slopes, coasts, and glacial landforms. Over 40 techniques are described.]
- DUNN, P. R., and others. Late Pre-Cambrian glaciation in Australia as a stratigraphic boundary, [by] P. R. Dunn, B. P. Thomson, K. Rankama. *Nature*, Vol. 231, No. 5304, 1971, p. 498–502. [Establishment of a chrono-stratigraphic unit for the Pre-Cambrian, based on study of Late Pre-Cambrian glaciogenic rocks, is proposed for use in Australia and eventually throughout the world.]
- EMILLANI, C. Paleotemperature variations across the Plio-Pleistocene boundary. *Science*, Vol. 171, No. 3966, 1971, p. 60–62. [Strong variations in the $^{18}\text{O}/^{16}\text{O}$ and $^{13}\text{C}/^{12}\text{C}$ ratios occur through the type section for the Plio-Pleistocene boundary, but the boundary itself is not characterized by unusual isotopic gradients.]
- EVERETT, K. R. Observations on the glacial history of Livingston Island. *Arctic*, Vol. 24, No. 1, 1971, p. 41–50. [Three glacial events described.]
- FAIRBRIDGE, R. W. The Sahara Desert ice cap. *Natural History*, Vol. 80, No. 6, 1971, p. 66–73. [Discusses geologic and palaeomagnetic evidence that 450 million years ago the South Pole was in what is now the Sahara Desert.]
- GLÜCKERT, G. Stranddünenwälle am Längsoszug Virttaankangas-Säkylänharju in SW-Finland [Fossil transverse dunes on the slopes of the Virttaa-Säkylä esker system, south-west Finland]. *Bulletin of the Geological Society of Finland*, No. 43, Pt. 1, 1971, p. 7–18. [Discusses formation of these dunes and of the Säkylä esker.]
- HILL, A. R. The internal composition and structure of drumlins in north Down and south Antrim, Northern Ireland. *Geografiska Annaler*, Vol. 53A, No. 1, 1971, p. 14–31. [Theory of mechanism of drumlin formation suggested.]
- JESSOP, A. M. The distribution of glacial perturbation of heat flow in Canada. *Canadian Journal of Earth Sciences*, Vol. 8, No. 1, 1971, p. 162–66. [In most areas the perturbation of heat flow caused by Pleistocene glaciations is about 10% or less of the world average heat flow.]

- LAVERDIÈRE, C. Sur quelques indicateurs glaciaires de la région de Chibougamau, Québec. *Revue de Géographie de Montréal*, Vol. 25, No. 1, 1971, p. 77-83. [Observations on erratic blocks.]
- LEWIS, C. A., ed. *The glaciations of Wales and adjoining regions*. London, Longman Group Ltd., [c1970]. (Geographies for Advanced Study.) xv, 378 p. [Contents: C. A. Lewis, "Introduction", p. 1-20; J. B. Whitton and D. F. Ball, "North-west Wales", p. 21-58; C. Embleton, "North-eastern Wales", p. 59-82; P. Worsley, "The Cheshire-Shropshire lowlands", p. 83-106; N. Stephens, "The lower Severn Valley", p. 107-24; E. Watson, "The Cardigan Bay area", p. 125-45; C. A. Lewis, "The upper Wye and Usk regions", p. 147-74; B. H. Luckman, "The Hereford basin", p. 175-96; D. Q. Bowen, "South-east and central South Wales", p. 197-227; B. S. John, "Pembrokeshire", p. 229-65; N. Stephens, "The West Country and Southern Ireland", p. 267-314; F. M. Synge, "The Pleistocene period in Wales", p. 315-50.]
- MCDONALD, B. C., and SHILTS, W. W. Quaternary stratigraphy and events in southeastern Quebec. *Geological Society of America. Bulletin*, Vol. 82, No. 3, 1971, p. 683-97. [Results enable dating of glacial sequences.]
- McKENZIE, G. D. Glacial geology of Adams Inlet, southeastern Alaska. *Ohio State University. Institute of Polar Studies. Report No. 25*, 1970, viii, 121 p. [Detailed study of glacial history of area described and related to that of other parts of Glacier Bay, particularly Muir Inlet.]
- McLELLAN, A. G. Ambiguous "glacial" striae formed near waterbodies. *Canadian Journal of Earth Sciences*, Vol. 8, No. 4, 1971, p. 477-79. [Striations indistinguishable from glacial striations are formed by boulders pushed shorewards by lake ice. Thus striations alone do not provide unequivocal evidence for the direction of movement of continental ice sheets.]
- MARK, D. M. Trend surface analysis of radiocarbon ages of glaciomarine sediments. *Albertan Geographer*, No. 7, 1971, p. 50-51. [Promising results of investigation into pattern of Pleistocene glaciation in Washington (state), U.S.A., and British Columbia.]
- MÖRNER, N.-A. Eustatic and climatic oscillations. *Arctic and Alpine Research*, Vol. 3, No. 2, 1971, p. 167-71. [Supports theory that oscillating global climates demand an oscillating eustatic sea-level, but suggests the curve should be of low amplitude.]
- MÖRNER, N.-A. Eustatic changes during the last 20,000 years and a method of separating the isostatic and eustatic factors in an uplifted area. *Palaeogeography, Palaeoclimatology, Palaeoecology*, Vol. 9, No. 3, 1971, p. 153-81. [Results from Swedish west coast and Kattegatt.]
- MÖRNER, N.-A. The position of the ocean level during the interstadial at about 30 000 B.P. A discussion from a climatic-glaciologic point of view. *Canadian Journal of Earth Sciences*, Vol. 8, No. 1, 1971, p. 132-43. [Suggests that a eustatic sea-level about the same level as present was impossible at 30 000 B.P.]
- OKKO, M., and PERTTUNEN, M. A mound field in the second Salpausselkä ice-marginal belt at Kurhila, southern Finland. *Bulletin of the Geological Society of Finland*, No. 43, Pt. 1, 1971, p. 47-54. [Studies indicate mounds are a type of ice-marginal deposit not previously known to exist in Finland.]
- PIPPAN, T. Characteristics of valley sections in a moderate relief controlled by fluvial erosion (Puerto Rico) compared with those influenced by both fluvial and glacial erosion (Alpine Flysch zone and Bohemian Forest). *Zeitschrift für Geomorphologie*, Supplementband 9, 1970, p. 119-26. [Depth and upper width of valleys, and the slope of their sides, in the non-glaciated Puerto Rico area is greater than in the other areas.]
- PORTMANN, J.-P. Géomorphologie de l'aire myriamétrique de Poste-de-la-Baleine (Nouveau-Québec). *Cahiers de Géographie de Québec*, 15^e An., No. 34, 1971, p. 53-76. [General description of area; marked evidence of previous glaciations.]
- PORTMANN, J.-P. Présence de moraine de fond à Poste-de-la-Baleine (Nouveau-Québec). *Cahiers de Géographie de Québec*, 14^e An., No. 32, 1970, p. 243-51. [Suggests till found on bed of Great Whale River is of ancient, not recent, glacial origin.]
- SMITH, P. A. W. Glacial geomorphology of the Saglek Fjord area of northeast Labrador. *McGill Sub-Arctic Research Papers*, No. 24, 1969, p. 115-23. [1967 field work on: glacial history of area; technique of surface block orientation applied to investigation of ice movement in areas of mountain-top detritus; and processes responsible for deposition of Nakvak terraces.]
- THEAKSTONE, W. H. Sediments, structures and processes. Studies at the Østerdalsisen glacier-dammed lake, 1970. *Aarhus Universitet. Geografisk Institut. Laboratoriet for Fysisk Geografi. Skrifter*, No. 2, 1970, [19] leaves. [Describes structures revealed by exposure of 70 m thick sedimentary sequence.]
- TIPPER, H. B. Multiple glaciation in central British Columbia. *Canadian Journal of Earth Sciences*, Vol. 8, No. 7, 1971, p. 743-52. [Discusses Pleistocene glacial history of area.]
- UPDIKE, R. G., and PÉWÉ, T. L. The glacial and related Quaternary events of the San Francisco Peaks, Arizona. (In Smith, C. T., ed. *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region, 1970*. Cedar City, Utah, National Association of Geology Teachers, [1971], p. 39-42.) [Brief outline of glacial sequence.]

FROST ACTION ON ROCKS AND SOIL. FROZEN GROUND. PERMAFROST

- BAULIN, V. V., and others. Novyye dannyye o stroyenii mnogeletnemerzlykh porod v nizov'yakh r. Vilyuy [New data on the structure of rocks frozen for many years along the course of the Vilyuy river]. [By] V. V. Baulin, A. Ye. Shutkin [and] N. S. Danilova. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya*, 1970, No. 1, p. 75-82.
- BERGERSEN, O. F., and FOLLESTAD, B. A. Evidence of fossil ice wedges in Early Weichselian deposits at Foss-Eikjeland, Jaeren, south-west Norway. *Norsk Geografisk Tidsskrift*, Bd. 25, Ht. 1, 1971, p. 39-45. [Significance in placing of deposits in Pleistocene stratigraphy.]
- BOWLEY, W. W., and BURGHARDT, M. D. Thermodynamics and stones. *Eos. Transactions, American Geophysical Union*, Vol. 52, No. 1, 1971, p. 4-7. [Explains how freezing and subsequent thawing of soil causes upward movement of stones therein.]

- BROSCHKE, K.-U. Beobachtungen an rezenten Periglazialerscheinungen in einigen Hochgebirgen der Iberischen Halbinsel (Sierra Segura, Sierra de Gredos, Serra da Estrêla, Sierra del Moncayo). *Erde*, 102. Jahrg., Ht. 1, 1971, p. 34-52. [Observations on periglacial phenomena in the mountains of Spain and Portugal.]
- BÜDEL, J. Der Eisrinden-Effekt als Motor der Tiefenerosion in der exzessiven Talbildungszone. *Würzburger Geographische Arbeiten*, Ht. 25, 1969, 41 p. [Part played by so-called ice rind (uppermost part of permafrost beneath active layer) in depth erosion of valleys in non-glaciated polar regions. English summary, p. 38-39.]
- DAY, J. H., and RICE, H. M. The characteristics of some permafrost soils in the Mackenzie Valley, N.W.T. (In Nelson, J. G., and Chambers, M. J., ed. *Vegetation, soils and wildlife*. Toronto, etc., Methuen, [c1969], p. 139-54. (Process and Method in Canadian Geography.)) [Describes permafrost soils in 3 localities each with different vegetation; the morphological, chemical, physical and mineralogical characteristics of several soil profiles; and the effect of permafrost and vegetation on soil development.]
- FRENCH, H. M. Ice cored mounds and patterned ground, southern Banks Island, western Canadian Arctic. *Geografiska Annaler*, Vol. 53A, No. 1, 1971, p. 32-38. [Describes distinctive type of ice cored hummock which occurs in Masik valley in association with distinctive type of patterned ground and soil development.]
- HARWOOD, T. A., and BROWN, R. J. E. Permafrost. (In Smith, C. H., ed. *Background papers on the earth sciences in Canada*. Canada. *Geological Survey. Paper* 69-56, 1970, p. 124-33.) [General survey of activities in Canada.]
- KEEBLE, A. B. Freeze-thaw cycles and rock weathering in Alberta. *Albertan Geographer*, No. 7, 1971, p. 34-42. [Laboratory experiments suggest that freezing and thawing is important in rock break-down in these latitudes and is probably the dominant type of mechanical weathering here.]
- KINOSITA, S., and others. Kitami ni okeru tōjō kansoku shōwa nen tōki [Observation of frost heave in Kitami (1969-70)]. [By] S. Kinoshita, Y. Suzuki, K. Horiguchi, K. Tanuma [and] T. Ono. *Teion-kagaku: Low Temperature Science*, Ser. A, [Supplement to No.] 28, *Shiryō Shū: Data Report*, 1970, p. 81-84.
- KINOSITA, S., and others. Tōjō to chika-suiri tonō kankei. II [The relation between frost heaving and underground water level. II]. [By] S. Kinoshita, Y. Suzuki, K. Horiguchi [and] K. Tanuma. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 325-36. [Equation suggested for relationship. English summary, p. 336.]
- MACKAY, J. R. The origin of massive icy beds in permafrost, western Arctic coast, Canada. *Canadian Journal of Earth Sciences*, Vol. 8, No. 4, 1971, p. 397-422. [Suggests that massive ground ice, observed in undisturbed and glacially disturbed Pleistocene sediments and in drill hole cuttings and cores, is of segregation origin. The source of excess water was from expulsion of ground water during the freezing of sands and high water pressures developed beneath an aggrading impermeable permafrost cover.]
- OUTCALT, S. I. An algorithm for needle ice growth. *Water Resources Research*, Vol. 7, No. 2, 1971, p. 394-400. [Algorithm based on hypothesis that variations in morphology of needle ice growth can be traced to variability in surface energy transfer, soil water tension, and the thermal-hydraulic properties of the near-surface soil layers during needle evolution.]
- POTTS, A. S. Fossil cryonival features in central Wales. *Geografiska Annaler*, Vol. 53A, No. 1, 1971, p. 39-51. [Areal distribution of features described and discussed in relation to factors affecting this distribution.]
- SEMMELE, A. Verwitterungs- und Abtragungerscheinungen in rezenten Periglazialgebieten (Lapland und Spitzbergen). *Würzburger Geographische Arbeiten*, Ht. 26, 1969, 82 p. [Observations on patterned ground reported and influence of periglacial processes on existing relief discussed. English summary, p. 81-82.]
- SOUTADÉ, G. Exhumation de sols polygonaux et dégradation de la pelouse d'altitude sur Le Pla de Gorra Blanc (2 450 m), Massif du Puigmal—Pyrénées méditerranéennes. *Bulletin de l'Association de Géographes Français*, No. 384, 1970, p. 259-76. [Polygonal soils observed in this area, visible through vegetation.]
- VIVIAN, R. Cryoclastic et érosion glaciaire. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences* (Paris), Sér. D, Tom. 272, No. 20, 1971, p. 2524-26. [Freezing and unfreezing of ice beneath a moving glacier and the effect of the process on the formation of proglacial margins.]
- WASHBURN, A. L. Instrumental observations of mass-wasting in an Arctic climate. *Zeitschrift für Geomorphologie*, Supplementband 9, 1970, p. 102-18. [Conclusions from field work in the Mesters Vig area of Greenland.]
- WHITE, S. E. Rock glacier studies in the Colorado Front Range, 1961 to 1968. *Arctic and Alpine Research*, Vol. 3, No. 1, 1971, p. 43-64. [Describes and discusses appearance, behaviour and glacial history of Arapaho, Taylor and Fair rock glaciers.]
- YONG, R. N., and OSLER, J. C. Heave and heaving pressures in frozen soils. *Canadian Geotechnical Journal*, Vol. 8, No. 2, 1971, p. 272-82. [Reappraisal of existing concepts to include hitherto unexplained facets of the observed behaviour of frozen soils.]

METEOROLOGICAL AND CLIMATOLOGICAL GLACIOLOGY

- AUER, A. H., jr. Observations of ice crystal nucleation by droplet freezing in natural clouds. *Journal of the Atmospheric Sciences*, Vol. 28, No. 2, 1971, p. 285-90. [Observation in orographic cloud caps of effect of AgI production of ice crystals with cloud droplet embryos.]
- BOUCHER, R. J., and OTTERSTEN, H. Doppler radar observation of wind structure in snow. *Journal of Applied Meteorology*, Vol. 10, No. 2, 1971, p. 228-33. [Describes measuring technique, using snow as the wind tracer.]
- BOYD, D. W. Icing of wires in Canada. *Proceedings of the 27th annual Eastern Snow Conference*, 1970, p. 46-57. [Progress report on collection of data. Tentative conclusions presented about relative severity of icing loads for use in design of communication and power transmission lines.]
- CHENG, R. J. Water drop freezing: ejection of microdroplets. *Science*, Vol. 170, No. 3965, 1970, p. 1395-96. [Description of phenomenon, which with electrical properties of droplets is a possible mechanism for charge generation in thunder-storms.]

- DAVIS, B. L. *In situ* X-ray analysis of ice crystal fallout from seeded clouds. *Journal of the Atmospheric Sciences*, Vol. 28, No. 1, 1971, p. 99–109. [Data on ice crystal shapes, numbers and volume.]
- GABARASHVILI, T. G., and GVELESIANI, A. I. Ob osobennostyakh zamerzaniya perekhlazhdennykh kapel' vody stalkivayushchikhsya s gradinoy v elektricheskoy pole [A description of the freezing of supercooled water drops colliding with hail in an electric field]. *Izvestiya Akademii Nauk SSSR. Fizika Atmosfery i Okeana*, Tom 6, No. 9, 1970, p. 960–64. [Study of phenomenon shows electric field changes spreading of drop on ice surface, crystallization kinetics, and bubble structure of ice. English translation in *Izvestiya. Academy of Sciences, U.S.S.R. Atmospheric and Oceanic Physics*, Vol. 6, No. 9, 1970 [pub. 1971], p. 571–74.]
- HOLMGREN, B. Climate and energy exchange on a sub-polar ice cap in summer. Arctic Institute of North America Devon Island Expedition 1961–1963. *Meddelanden från Uppsala Universitets Meteorologiska Institution*, Nr. 107–12, 1971, 83, 43, 29, 111, 53 p. [Report in six parts on climatology and various components of energy exchange at snow surface of Devon Island ice cap in Arctic Canada.]
- HUFFMAN, P. J., and OHTAKE, T. Formation and growth of ice fog particles at Fairbanks, Alaska. *Journal of Geophysical Research*, Vol. 76, No. 3, 1971, p. 657–65. [Mechanism proposed.]
- KOENIG, L. R. Numerical modeling of ice deposition. *Journal of the Atmospheric Sciences*, Vol. 28, No. 2, 1971, p. 226–37. [Method of computing rate of growth by deposition from vapour, including effect of forced convection as crystal falls through air.]
- KOLOSOVA, N. V. Pyaty mezhdudepomstvenny seminar po probleme "Gidrometeorologicheskiye usloviya obledeneniya sudov" [Fifth interdepartmental seminar on the problem "Hydrological conditions for icing of ships"]. *Problemy Arktiki i Antarktiki*, Vyp. 35, 1970, p. 118–19. [At Kaliningrad, May 1969.]
- LIST, R., and SCHEMENAUER, R. S. Free-fall behavior of planar snow crystals, conical graupel and small hail. *Journal of the Atmospheric Sciences*, Vol. 28, No. 1, 1971, p. 110–15. [Experimental determination of drag coefficients of models of crystals and deduction of fall behaviour.]
- MOSSOP, S. C. Some hailstones of unusual shape. *Weather*, Vol. 26, No. 5, 1971, p. 222 [photographs on p. 220 and cover]. [Knobbly hailstones in Sydney, Australia, 3 January 1971.]
- PLASS, G. N., and KATTAWAR, G. W. Radiative transfer in water and ice clouds in the visible and infrared region. *Applied Optics*, Vol. 10, No. 4, 1971, p. 738–48. [Calculation of radiance and polarization shows differences that could be used to identify ice clouds remotely.]
- STEWART, R. Ice, snow and hot water. *Proceedings of the 27th annual Eastern Snow Conference*, 1970, p. 58–62. [Inadvertent weather modification due to thermal discharge from nuclear-fuelled power generating plants described, and beneficial ways of using discharge suggested.]
- WEICKMANN, H. K., and others. The Great Lakes project, [by] H. K. Weickmann, J. Jiusto, G. McVehil, R. Pilic and J. Warburton. *Proceedings of the 27th annual Eastern Snow Conference*, 1970, p. 18–31. [Experiments on cloud seeding described in order to prevent heavy snowfalls over Buffalo area.]

SNOW

- ANDERSON, J. A., and ROCKWOOD, D. M. Runoff synthesis for rain-on-snow basin. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 82–90. [Describes streamflow synthesis portion of the streamflow synthesis and reservoir regulation (SSARR) model, and illustrates reconstitution of streamflow resulting from rainfall and/or snow melt on the Willamette Basin Snow Laboratory, Oregon.]
- BROWN, J. W. An approach to snow load evaluation. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 52–60. [Problem of calculating snow loads on roofs from ground snow load, with reference to data from Nevada.]
- CANOVAN, R. A. A November snowfall in south-east England. *Weather*, Vol. 25, No. 11, 1970, p. 478–86. [Sequence of events which led to unusual occurrence of snowfall in 1969.]
- CORBEL, J., and others. Étude physico-chimique et hypothèses de formation d'un gypse cristallisé découvert sur les neiges du Spitzberg, [par] J. Corbel, M. Murat et G. Gallo. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences* (Paris), Sér. D, Tom. 270, No. 24, 1970, p. 2887–90. [Study of a gypsum deposit found on the snow in Spitsbergen and hypotheses about its formation.]
- COULSON, C. A. Snow course weighting procedure. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 74–81. [Water equivalents from many snow courses in or near a watershed were combined to obtain more accurate run-off forecasts in British Columbia.]
- CROW, L. W., and others. The surface instrument network of the Upper Colorado River Pilot Project, by L. W. Crow, C. F. Chappell and G. W. Jones. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 16–23. [Objective and operation of network described.]
- DAVAR, K. S. Snowmelt measurements and their use in synthesizing snowmelt hydrographs. *Proceedings of the 27th annual Eastern Snow Conference*, 1970, p. 87–97. [Establishment of network of snow melt plots, for measuring total amount and rate of snow melt, in a stream basin is described, and results discussed.]
- FERLAND, M., and GOSSELIN, P. Water equivalent measurements with snow pillows in the Laurentians. *Proceedings of the 27th annual Eastern Snow Conference*, 1970, p. 67–75. [Depending upon climatic conditions, the pressure pillow may be useful for indicating snow accumulation and ablation in this area.]
- FISHER, W. H., and SPORNS, U. Snow and reservoir management in Canada for the Columbia River Treaty Operation. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 1–6. [Describes objectives of management, and methods established for achieving these, and procedures for obtaining seasonal run-off forecasts.]
- GEORGE, T. A. The Deschutes River hydrograph forecast. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 68–73. [Describes procedure used to obtain successful forecasts of critical levels and dates of these levels at Bend, Oregon.]
- GRAY, D. M., and others. Densities of prairie snowpacks, by D. M. Gray, D. I. Norum and G. E. Dyck. *Proceedings*

- of the Western Snow Conference, 38th annual meeting, 1970, p. 24-30. [Results presented of observations on density, effect of drifting, and seasonal variations in density.]
- HANNAFORD, J. F., and others. The development and application of a hydrologic model as an operational tool, by J. F. Hannaford, R. H. Bush and R. E. Barsch. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 7-15. [Development of hydrologic computer model of Kings River basin, California, to assist in forecasting run-off.]
- HUZIOKA, T., and others. Nadare kansoku jikkenshitsu jikkenshamen no setsushitsui chōsa hōkoku. IV [Report of investigation of snow conditions in avalanche research experimental cave and slope, Toikanbetsu, northern Hokkaido. IV (1969-70)]. [By] T. Huzioka, H. Shimizu, E. Akitaya [and] H. Narita. *Teion-kagaku: Low Temperature Science*, Ser. A, [Supplement to No.] 28, *Shiryō Shū: Data Report*, 1970, p. 37-42.
- ISHIKAWA, N., and ISHIDA, T. Kōri oyobi yuki no naibu-shōon. I [An experimental study of local temperature increase in snow and ice. I]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 165-73. [This increase was affected by wind velocity, amount of radiation and the temperature at the bottom of the sample of snow or ice. English summary, p. 172-73.]
- KITAHARA, T., and KUROIWA, D. Sekisetsu no atsumitsuka ni tomonau hiteikō no henka [The variation of d.c. resistivity of accumulated snow during the densification process]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 113-24. [Describes and discusses results of laboratory compression at -10°C over period of several days. English summary, p. 124.]
- KOBAYASHI, D. Jifubuki no hassei to hattatsu [Generation and development of drifting snow]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 141-46. [Growth length required for drifting snow to develop to 90% of the snow transport capacity of wind is 30-60 m. English summary, p. 145-46.]
- KOBAYASHI, S., and ISHIDA, T. Jifubuki-toki ni okeru kaze no ranryū [On wind turbulence during drifting snow]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 125-33. [Presents and discusses results of measurements made at height of 1 m above snow surface at Hokkaido, Japan, from January to March 1969. English summary, p. 133.]
- KOBAYASHI, S., and ISHIKAWA, N. Jifubuki-toki ni okeru sekisetsu-hyōmen-sō no shinshoku to taiseki. II [Snow erosion and snow accumulation by wind of the surface layer of accumulated snow during snow drifting. II]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 135-40. [Relates snow drift forms to wind speed and scale of turbulence. English summary, p. 139.]
- KOJIMA, K., and others. Moshiri ni okeru yūsetsu: kishō kansoku shiryō (1968) [Observations of snow melt and micrometeorology in Moshiri (Hokkaido) (1968)]. [By] K. Kojima, D. Kobayashi, S. Kobayashi, R. Naruse [and] N. Ishikawa. *Teion-kagaku: Low Temperature Science*, Ser. A, [Supplement to No.] 28, *Shiryō Shū: Data Report*, 1970, p. 1-23.
- KOJIMA, K., and others. Moshiri no shōryūiki ni okeru yūsetsu, ryūshutsu oyobi netsu-shūshi no kenkyū. I [Studies of snow melt, run-off, and heat balance in a small drainage area in Moshiri, Hokkaido. I]. [By] K. Kojima, D. Kobayashi, S. Kobayashi, H. Aburakawa [and] N. Ishikawa. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 175-90. [Consideration of areal differences in rate of snow melt and of meteorological conditions in this region in April. English summary, p. 189-90.]
- KOJIMA, K., and others. Sapporo no heichi sekisetsu danmen sokutei shiryō hōkoku Shōwa 43-44 nen tōgi [Report of observations of section of snow accumulation on flat land in Sapporo, 1968-69]. [By] K. Kojima, D. Kobayashi, S. Kobayashi, E. Akitaya, H. Narita [and] N. Ishikawa. *Teion-kagaku: Low Temperature Science*, Ser. A, [Supplement to No.] 28, *Shiryō Shū: Data Report*, 1970, p. 25-36.
- LUTES, D. A. Snow loads for the design of roofs in Canada. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 61-67. [Determination of proper design snow loads in accordance with the National Building Code of Canada discussed.]
- MANLEY, G. The mountain snows of Britain. *Weather*, Vol. 26, No. 5, 1971, p. 192-200. [Compares observations from different regions and discusses depth and persistence of snowfall.]
- NARUSE, R. Nankyoku-Shōwakichi taigan no tairikuengan ni okeru jifubukiryō no sokutei [Measurement of drifting snow on the coast of the Antarctic continent opposite "Syowa" station]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 147-54. [From the vertical distribution of drift flux obtained by snow traps, the total drift snow transport at various wind speeds was calculated and compared with that of "Byrd" station and of Sapporo. English summary, p. 153-54.]
- NARUSE, R., and others. Kion yūsetsu no yagaikenkyū [Field studies on snow melt due to sensible heat transfer from the atmosphere]. [By] R. Naruse, H. Ōura [and] K. Kojima. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 191-202. [Heat balance studies establish relationship between ablation rate due to sensible heat transfer and meteorological factors such as air temperature and wind speed above the snow surface. English summary, p. 201-02.]
- OBEDKOFF, W., and RUSSELL, S. O. Using all available hydrologic data. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 31-36. [Applicability to South Thompson River basin, British Columbia, of grid square method for estimating distribution of mean annual run-off over large areas, and extension of method to make use of snow course data as well as meteorological and streamflow data.]
- OHTAKE, T. Factors affecting the size distribution of raindrops and snowflakes. *Journal of the Atmospheric Sciences*, Vol. 27, No. 5, 1970, p. 804-13. [Size distribution of raindrops depends on that of snow-flakes from which they form.]
- PEARSON, G. L. Hydro-climatological trends and variability in mountains of the western United States. *Proceedings of the 27th annual Eastern Snow Conference*, 1970, p. 6-17. [Difficulties stressed of obtaining accurate advance knowledge of the flow of rivers fed by melting snowpack of remote and inaccessible mountains.]
- PIPES, A., and others. Simulating snowmelt hydrographs for the Fraser River system, by A. Pipes, M. C. Quick and S. O. Russell. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 91-97. [Describes development of computer simulation model of Fraser River system for flood forecasting, etc.]

- PODZIMEK, J. Aggregation of ice crystals related to the problem of heavy snowfall. *Proceedings of the 27th annual Eastern Snow Conference*, 1970, p. 32-45. [Microstructure of heavy snowfall clouds examined, using material from laboratory studies of behaviour of falling ice crystal models and results from investigations into aggregate forms of natural and artificial ice crystals.]
- QUICK, M. C. Laboratory simulation of snowmelt. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 37-43. [Equipment, experiments and results described.]
- SCHAERER, P. A. Variation of ground snow loads in British Columbia. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 44-48. [Relationship between elevation and ground snow load established in order to calculate expected snow loads on roofs.]
- SHANNON, W. G., and FREEMAN, T. G. Snow survey telemetry networks and future plans. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 98-101. [Some general principles discussed.]
- THOM, B. G., and GRANBERG, H. Patterns of snow accumulation in a forest-tundra environment, central Labrador-Ungava. *Proceedings of the 27th annual Eastern Snow Conference*, 1970, p. 76-86. [Sequence of events throughout winter summarized. Effect of topography and vegetation described.]
- THOM, H. C. S. Development of snow load design data for the United States. *Proceedings of the Western Snow Conference*, 38th annual meeting, 1970, p. 49-51. [Discusses proposed new ANSI (American National Standards Institute) Standard for snow load design.]
- YAMADA, T., and others. Daisetsu-san ni okeru kōkasetsu no kenkyū [Studies of hardened snow on Mt. Daisetsu]. [By] T. Yamada, K. Tusima, H. Aburakawa, N. Satō [and] M. Nakao. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 28, 1970, p. 155-64. [Reports types and areal and vertical distribution of hardened snow on this Japanese mountain. English summary, p. 164.]

ERRATA

Vol. 8, No. 54, p. 497. In the entry PEROV, V. F., for Khibniskikh read Khibinskikh.

Vol. 9, No. 56, p. 295. In the entry UNTERSTEINER, N., and MAYKUT, G. A., for p. 12-13 read p. 12-23.

Vol. 10, No. 58, p. 134-36. The illustrations in the short note entitled "An improved method for determining ice fabrics" by J. R. Hill and N. P. Lasca were misplaced relative to their captions. The diagram appearing above the caption for Figure 1 is in fact Figure 6 and should have appeared on p. 136. All other diagrams should be moved forward, thus Figure 1 appears above the caption for Figure 2 etc.

Vol. 10, No. 58, p. 162. In the first entry the name KVILIVIDZE should read KVLIVIDZE at both places where it appears.

Vol. 10, No. 59, p. 269. The asterisk after C. J. READINGS should be deleted, and an asterisk should be inserted after J. T. BARTLETT.