

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 *Recent Polar Literature* (supplement to 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.

CONFERENCES

- [CONFERENCE: PERMAFROST.] *Permafrost. Second International Conference. 13-28 July 1973, Yakutsk, U.S.S.R. North American contribution. Organizing Committee of Canada, National Research Council of Canada and United States Planning Committee, U.S. National Academy of Sciences, National Academy of Engineering, National Research Council.* Washington, D.C., National Academy of Sciences, 1973. xi, 783 p. [For details of individual papers see elsewhere in this list.]
- KOTLYAKOV, V. M., ed. *Glyatsiologidroklimatologiya gornyykh stran* [Glaciohydroclimatology of highlands]. *Rezultaty Issledovaniy po Mezhdunarodnym Geofizicheskim Proyektam. Glyatsiologicheskiye Issledovaniya*, No. 24, 1973, 199 p. [Papers presented at the fourth all-Union glaciological symposium, held in 1968 at Terskol in the Caucasus.]
- ORVIG, S., ed. *Energy fluxes over polar surfaces: proceedings of the IAMAP/IAPSO/SCAR/WMO Symposium, Moscow, 3-5 August 1971.* Geneva, World Meteorological Organization, 1973. [viii], 299 p. (World Meteorological Organization, Technical Note No. 129; WMO, No. 361.) [For details of individual papers see elsewhere in this list.]
- PÉWÉ, T. L. Northeast Siberia—a report on the second International Conference on Permafrost. *Arctic Bulletin*, Vol. 1, No. 2, 1973, p. 29-36. [Account of conference, held in Yakutsk, 15-28 July 1973 and of field excursions, mentioning glaciological features observed.]

GENERAL

- GOVORUKHA, L. S. *Glyatsiologicheskiye issledovaniya na lednikakh o. Desepshen v period raboty mezhdunarodnoy vulkanologicheskoy ekspeditsii* [Glaciological research on Deception Island during the international vulcanology expedition]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 318, 1973, p. 87-99. [1970 expedition.]
- LORIG, C., and VAUGELADE, J. International Antarctic Glaciological Project traverse, Dumont d'Urville to Vostok. *Antarctic Journal of the United States*, Vol. 8, No. 4, 1973, p. 171-72. [Describes 1972-73 activities.]
- MURRAY, B. C., and MALIN, M. C. Polar volatiles on Mars. Theory versus observation. *Science*, Vol. 182, No. 4111, 1973, p. 437-43. [Results of Mariner 9 mission used to discuss nature of polar caps on Mars.]
- NUNNALLY, N. R. ERTS-1 imagery and Arctic research: the systems and its operation. *Arctic Bulletin*, Vol. 1, No. 2, 1973, p. 38-42. [General information, including observations currently being made of sea ice, snow cover and glaciers.]
- SEKANINA, Z. Existence of icy comet tails at large distances from the Sun. *Astrophysical Letters*, Vol. 14, No. 4, 1973, p. 175-80. [Size distribution implies presence of clathrate hydrates.]
- SIREN, J. C. Radioactive wastes. *Physics Today*, Vol. 27, No. 2, 1974, p. 15, 67. [Comment on article by J. O. Blomeke, J. P. Nichols and W. C. McClain, *ibid.*, Vol. 26, No. 8, 1973, p. 36-42, which dismisses idea of disposing waste in ice sheets, with reply by authors stating why they so dismissed it.]
- TEN BRINK, N. W., and CURL, J. E. Glaciology and glacial chronology in the South Shetland Islands. *Antarctic Journal of the United States*, Vol. 8, No. 4, 1973, p. 175-77. [Describes 1972-73 field work on Deception and Livingston Islands.]

GLACIOLOGICAL INSTRUMENTS AND METHODS

- DENTON, G. H., and KARLÉN, W. Lichenometry: its application to Holocene marine studies in southern Alaska and Swedish Lapland. *Arctic and Alpine Research*, Vol. 5, No. 4, 1973, p. 347-72. [Discusses techniques and problems in application of lichenometry.]
- FINSTERWALDER, RÜDIGER. Begleitwort zur Karte des Vernagtfeners 1 : 10.000 vom Jahre 1969. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 5-10. [Presents map (in separate map supplement) composed from air photographs, conceived as a topographical map with geodetic and glaciological content. Explains methods of survey and discusses means of cartographic representation.]
- TŌKAIRIN, A. Kandenchi-shiki kan'i nessen hyōkō-kei ni tsuite [On the measurement of ice growth by hot-wire ice thickness meter]. *Seppyo*, Vol. 35, No. 4, 1973, p. 169-72. [Description of hot-wire apparatus for measuring thickness of floating ice as a function of time. English summary, p. 172.]
- TURNER, F. M., and RADKE, L. F. The design and evaluation of an airborne optical ice particle counter. *Journal of Applied Meteorology*, Vol. 12, No. 8, 1973, p. 1309-18. [Description of apparatus that uses birefringence of ice to distinguish and reject water drops.]

- WARNER, G. G. The measurement of surface strain in glaciers using embedded resistance strain gages. *Dissertation Abstracts International*, B, Vol. 34, No. 6, 1973, p. 2648-B. [Description of gauges, which consist of five 10-foot (3 m) constantan wires and their testing in Ptarmigan Glacier, Alaska, and Cathedral Glacier, British Columbia, Canada. Abstract of Ph.D. thesis, Michigan State University, 1973. University Microfilms order no. 73-29795.]
- WEISS, H. V., and BERTINE, K. K. Simultaneous determination of manganese, copper, arsenic, cadmium, antimony and mercury in glacial ice by radioactivation. *Analytica Chimica Acta*, Vol. 65, No. 2, 1973, p. 253-59. [Method described.]
- PHYSICS OF ICE
- ANDERSON, D. M., and others. The water-ice phase composition of clay-water systems: I. The kaolinite-water system, [by] D. M. Anderson, A. R. Tice and A. Banin. *Soil Science Society of America. Proceedings*, Vol. 37, No. 6, 1973, p. 819-22. [After normalization to unit surface area, this system has higher unfrozen water content than any other clay-water system.]
- BALES, B. L., and others. Electron paramagnetic resonance and electron-nuclear double resonance line shape studies of trapped electrons in γ -irradiated deuterium-substituted 10M sodium hydroxide alkaline ice glass, by B. L. Bales, J. Helbert and L. Kevan. *Journal of Physical Chemistry*, Vol. 78, No. 3, 1974, p. 221-31. [Theoretical and experimental study of effect of deuteration.]
- BERNAS, A., and TRUONG, THU-BA. Sur la luminescence stimulée de la glace polycristalline irradiée par rayons γ . *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences (Paris)*, Sér. B, Tom. 277, No. 14, 1973, p. 391-94. [Luminescence of ice after γ -irradiation and optical bleaching attributed not to radicals or ions but to triplet state of water.]
- BILGRAM, J., and others. Perfection of zone refined ice single crystals, [by] J. Bilgram and H. Wenzl and G. Mair. *Journal of Crystal Growth*, Vol. 20, No. 4, 1973, p. 319-21. [Method of growing crystals as large as 3 l with dislocation density 10^3 cm^{-2} .]
- BOSI, P., and others. On the problem of the vibrational spectrum and structure of ice Ih: lattice dynamical calculations, [by] P. Bosi, R. Turbino and G. Zerbi. *Journal of Chemical Physics*, Vol. 59, No. 9, 1973, p. 4578-86. [Lattice dynamical treatment of ordered ice Ih.]
- BOWMAN, M., and others. Forbidden matrix proton spin flip satellites in trapped electron EPR spectra, by M. Bowman, L. Kevan, R. N. Schwartz and B. L. Bales. *Chemical Physics Letters*, Vol. 22, No. 1, 1973, p. 19-22. [Study on γ -irradiated frozen solutions of NaOH in H_2O and NaOD in D_2O .]
- BYCHKOV, V. Z., and others. Dielektricheskiye svoystva vody v oblasti fazovogo perekhoda zhidkost'-led [Dielectric properties of water in the liquid-ice phase transition region]. [By] V. Z. Bychkov, S. A. Fedulov, N. V. Mikhaylov. *Zhurnal Fizicheskoy Khimii*, Tom 48, Vyp. 2, 1974, p. 447-48. [Dielectric permittivity and loss tangent measured for ice and water through the phase transition. English translation in *Russian Journal of Physical Chemistry*, Vol. 48, No. 2, 1974.]
- BYERS, B. A. Secondary creep of polycrystalline ice under biaxial stress. *Dissertation Abstracts International*, B, Vol. 34, No. 5, 1973, p. 2101-B. [Experiments on thin-walled cylinders of randomly oriented polycrystalline ice used to confirm proportionality between deviatoric stress and corresponding creep rate at given value of second stress invariant. Abstract of Ph.D. thesis, University of Washington, 1973. University Microfilms order no. 73-27639.]
- CHEEKE, J. D. N., and others. Kapitza resistance of low acoustic impedance solids (ice and bismuth), by J. D. N. Cheeke, B. Hebral, J. Richard and R. R. Turkington. *Physics Letters A*, Vol. 46A, No. 2, 1973, p. 81-82. [Thermal resistance between ice and superfluid helium between 1-2 K is in agreement with theory.]
- CHEN, M.-S., and others. Hopping of ions in ice, by M.-S. Chen and L. Onsager, J. Bonner and J. Nagle. *Journal of Chemical Physics*, Vol. 60, No. 2, 1974, p. 405-19. [Theory of proton tunnelling between water molecules in ice developed and compared with experimental mobilities.]
- COHAN, N. V., and WEISSMANN, M. A quantum electronic polaron model of the hydrated electron. *Chemical Physics Letters*, Vol. 22, No. 2, 1973, p. 287-90. [Calculation of ground state of hydrated electron in low temperature ice.]
- CROWE, R. W., and SANTRY, D. P. The polarization and dipole moment of lattice water in hydrogen bonded crystals. *Chemical Physics Letters*, Vol. 22, No. 1, 1973, p. 52-55. [Calculation of dipole moments and charge distributions for H_2O molecules in ice Ih and ice Ic.]
- DABBY, S. S. Ice-brine separation in a bed of aggregates of fine ice crystals. *Dissertation Abstracts International*, B, Vol. 34, No. 7, 1974, p. 3224-B. [Attempt to improve rate of washing in a freezing desalination plant by compacting ice crystals into aggregates. Abstract of Ph.D. thesis, Cornell University, 1973. University Microfilms order no. 73-31797.]
- DUVAL, P. Fluage de la glace polycristalline pour les faibles contraintes. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences (Paris)*, Sér. A, Tom. 277, No. 14, 1973, p. 703-16. [For low stresses, creep of polycrystalline ice depends on grain size, and for small grains transient creep disappears and steady-state creep is proportional to stress.]
- FANG, J. K., and others. Role of proton-proton interactions in proton transfer processes in ice and water, [by] J. K. Fang, K. Godzik and G. L. Hofacker. *Berichte der Bunsengesellschaft für Physikalische Chemie*, Bd. 77, Nr. 10-11, 1973, p. 980-90. [Dynamics of hydrated proton studied theoretically. Collective proton states deduced and their coupling to local modes discussed. New mechanism for proton mobility in water suggested.]
- FLETCHER, N. H. Dendritic growth of ice crystals. *Journal of Crystal Growth*, Vol. 20, No. 4, 1973, p. 268-72. [Theoretical explanation of dendritic branching of ice crystals grown from the vapour from -10 to -20°C .]

- GENADIEV, N. P. Deactivation of ice-forming PbI_2 particles during heating. *Doklady Bolgarskoy Akademii Nauk*, Tom. 26, No. 8, 1973, p. 1025-27. [Laboratory studies show PbI_2 particles are deactivated by heating to 300°C and only partially regenerated by subsequent moistening.]
- GOROCH, A. K. A stochastic theory of the stepwise growth of ice crystal surfaces. *Dissertation Abstracts International*, B, Vol. 34, No. 8, 1974, p. 3975-B. [Theory which predicts the peak in rate of advance of a step as a function of temperature. Abstract of Ph.D. thesis, University of Missouri-Rolla, 1973. University Microfilms order no. 74-4347.]
- GOSAR, P. Note on the Hall effect in ice. *Physics of Condensed Matter*, Vol. 17, No. 3, 1974, p. 183-87. [Theoretical study shows Hall effect should be negligibly small if present picture of conduction processes is correct.]
- GRIFFITHS, R. F., and LATHAM, J. Electrical corona from ice hydrometeors. *Quarterly Journal of the Royal Meteorological Society*, Vol. 100, No. 424, 1974, p. 163-80. [Corona discharge observed from small ice particles provided temperature is above -18°C . Possible role in thunderstorms discussed.]
- GUO, W. W.-W. Kinetics of ice crystal growth from the vapor. *Dissertation Abstracts International*, B, Vol. 34, No. 5, 1973, p. 2224-B. [Theoretical solution for growth of a spheroidal ice crystal from the vapour. Abstract of Ph.D. thesis, University of Denver, 1973. University Microfilms order no. 73-28020.]
- HARDY, S., and CORIELL, S. R. Surface tension and interface kinetics of ice crystals freezing and melting in sodium chloride solutions. *Journal of Crystal Growth*, Vol. 20, No. 4, 1973, p. 292-300. [Measurements on growth and dissolution of cylindrical ice crystals used to deduce these parameters. Surface tension depends on impurity content of the ice.]
- HASTED, J. B. *Aqueous dielectrics*. London, Chapman and Hall, 1973. xiii, 302 p. (Studies in Chemical Physics.) [Chapters on the dielectric properties of ice, p. 100-16, applications to earth science, p. 256-86, the latter containing sections on dielectric properties of snow, dielectric properties of naturally occurring ice, radio-echo depth sounding of polar ice.]
- HUBMANN, M. Formale Aspekte eines Modelles von C. Jaccard für die elektrische Eigenschaften von Eis. *Helvetica Physica Acta*, Vol. 46, Fasc. 4, 1973, p. 421-22. [Experimental results used to deduce parameters in the theory of C. Jaccard, *ibid.*, Vol. 32, Fasc. 2, 1959, p. 89-128.]
- HUFFMAN, P. J. Supersaturation dependence of ice nucleation by deposition for silver iodide and natural aerosols. *Dissertation Abstracts International*, B, Vol. 34, No. 5, 1973, p. 2224-B-25-B. [Laboratory observations. Results indicate this process is likely to be insignificant compared with nucleation via freezing for seeded clouds. Field observations of ice nucleus concentrations. Abstract of Ph.D. thesis, University of Wyoming, 1973. University Microfilms order no. 73-25552.]
- JONES, D. R. H. Review: the free energies of solid-liquid interfaces. *Journal of Materials Science*, Vol. 9, No. 1, 1974, p. 1-17. [Includes review of work on ice-water and ice-brine interfacial energies.]
- KROH, J., and STRADOWSKI, C. Radiolysis of alkaline ice containing additives. (In Dobó, J., and Hedvig, P., ed. *Proceedings of the third Tihany Symposium on Radiation Chemistry*. Vol. 2. Budapest, Akadémiai Kiadó, 1972, p. 1173-80.) [Scavenging of mobile electrons by various negative ions and reactions of trapped electrons with these. Discussion, p. 1179-80.]
- MAE, S., and HIGASHI, A. Effects of plastic deformation on the dielectric properties of ice. *Crystal Lattice Defects*, Vol. 4, No. 4, 1973, p. 295-308. [Debye dispersion unaffected by plastic deformation; space-charge dispersion has increased permittivity and decreased relaxation time. Explanation in terms of H_3O^+ ions released from dislocation jogs.]
- MILOSHEV, G. N. New effect in freezing small waterdrops. *Doklady Bolgarskoy Akademii Nauk*, Tom. 26, No. 10, 1973, p. 1335-38. [Study of crystallization when wetting of solid nucleus is incomplete. Work for nucleus formation derived as function of drop radius.]
- NAIR, N. K., and CHIO, H. T. Surface structure of ice at low temperature from adsorption studies. *Malaysian Journal of Science*, Vol. 1(B), 1972, p. 163-72. [Adsorption of Ar, N and CO at 77.3 K studied. Data indicate lack of dipole field.]
- PARRAVICINI, G. P., and RESCA, L. Electronic states and optical properties in cubic ice. *Physical Review B*, Third Ser., Vol. 8, No. 6, 1973, p. 3009-23. [Electronic band structure derived for completely polarized ice Ic. Results for energy gap are in agreement with experimental values for cubic ice.]
- PERRY, J. W. Complex refractive index of ice fog at a radio wavelength of 3 mm. *Dissertation Abstracts International*, B, Vol. 34, No. 9, 1974, p. 4381-B. [Laboratory measurements for temperature range -30 to -48°C . Also measurements of complex dielectric permittivity of ice at 97 GHz. Abstract of Ph.D. thesis, University of Texas at Austin, 1973. University Microfilms order no. 74-5310.]
- PERRY, J. W., and STARITON, A. W. Revision of the dielectric constant of ice in the millimeter wave spectrum. *Journal of Applied Physics*, Vol. 44, No. 11, 1973, p. 5180. [Correction of values quoted by authors in an earlier paper, *ibid.*, Vol. 43, No. 2, 1972, p. 731-33.]
- RADKE, L. F., and HEGG, D. The shattering of saline droplets upon crystallization. *Journal de Recherches Atmosphériques*, Vol. 6, 1972, p. 447-55. [Experiments on saline aerosols in a diffusion chamber imply existence of this effect.]
- RAY, P. S. Broadband complex refractive indices of ice and water. *Applied Optics*, Vol. 11, No. 8, 1972, p. 1836-44. [Review of data over wide range of wavelengths and deduction of empirical model.]
- ROHATGI, P. K., and others. Dendritic structures produced on solidification of multicomponent aqueous solutions, [by] P. K. Rohatgi, E. J. Brush, S. M. Jain, C. M. Adams, Jr. *Materials Science and Engineering*, Vol. 13, No. 1, 1974, p. 3-18. [Dendrite structures studied as dependent on solute concentrations, diffusivity and local solidification time.]
- ROSINSKI, J., and others. Ice nucleation on radioactive and nonradioactive silver iodide particles, by J. Rosinski, G. Langer and C. T. Nagamoto, C. W. Thomas, J. A. Young and N. A. Wogman. *Journal of Applied Meteorology*, Vol. 12, No. 8, 1973, p. 1303-08. [Particles containing ^{131}I were more efficient nuclei than non-radioactive ones.]

- ROZENTAL', O. M. Voprosy obrazovaniya l'da v vode i rastvorakh. V. Upravleniye protsessom kristallizatsii s pomoshch'yu dobavok elektolita [Formation of ice in water and solutions. V. Control of crystallization using an electrolyte additive]. *Zhurnal Fizicheskoy Khimii*, Tom 47, Vyp. 12, 1973, p. 3043-45. [Addition of electrolytes decreases the freezing rate and affects polycrystallinity. English translation in *Russian Journal of Physical Chemistry*, Vol. 47, No. 12, 1973 [pub. 1974].]
- ROZENTAL', O. M. Voprosy obrazovaniya l'da v vode i rastvorakh. VI. Elektricheskiye faktory formirovaniya l'da [Formation of ice in water and solutions. VI. Electrical factors of ice formation]. *Zhurnal Fizicheskoy Khimii*, Tom 47, Vyp. 12, 1973, p. 3046-49. [Theory of ellipsoid form for ice crystals grown in an electric field. Earth's field is sufficient to produce effect, but insignificant as regards nucleation. English translation in *Russian Journal of Physical Chemistry*, Vol. 47, No. 12, 1973 [pub. 1974].]
- RUCKENSTEIN, E. Positive and negative nucleation catalysis in crystallization. *Journal of Colloid and Interface Science*, Vol. 45, No. 1, 1973, p. 115-25. [Initially white light increases nucleating ability of AgI, but longer exposure produces a decrease. Explanation discussed.]
- SCHAAF, J. W. The infrared reflectance of ice I. *Dissertation Abstracts International*, B, Vol. 34, No. 6, 1973, p. 2842-B. [Accurate measurement of absolute normal-incidence reflectance of ice at -7° C. Abstract of Ph.D. thesis, Kansas State University, 1973. University Microfilms order no. 73-26372.]
- SHUBIN, V. N., and others. Study of spectral and kinetic characteristics of short-lived particles in a solid phase, [by] V. N. Shubin, S. A. Kabakchi, T. E. Pernikova, Yu. I. Sharanin and P. I. Dolin. (In Dobó, J., and Hedvig, P., ed. *Proceedings of the third Tihany Symposium on Radiation Chemistry*. Vol. 2. Budapest, Akadémiai Kiadó, 1972, p. 1151-61.) [Ice irradiated with 5 MeV electrons and polaron yield and decay studied. Effect of dissolved KOH and of temperature. Discussion, p. 1160-61.]
- STEWART, M. K. Hydrogen and oxygen isotope fractionation during crystallization of mirabilite and ice. *Geochimica et Cosmochimica Acta*, Vol. 38, No. 1, 1974, p. 167-72. [Equilibrium fractionation factors between ice and 2.5 molal NaCl solution at -10° C. Results are of use in assessing mirabilite as a climatic indicator.]
- SUZUKI, M., and others. Rêdômu-jô kôu yuki no jun-miri-ha ni yoru gensui [Studies of the attenuation of quasi-millimetre waves on a rain and snow covered radome]. [By] M. Suzuki, M. Ono [and] Y. Nomura. *Seppyo*, Vol. 35, No. 4, 1973, p. 192-200. [Includes study of how snow accumulated on this dome and how this attenuates radar being transmitted through it. English summary, p. 200.]
- VASSOILLE, R., and others. Comportement anélastique de la glace aux faibles fréquences de sollicitation, [par] R. Vassoille, J. Tatibouet, J. Perez et P.-F. Gobin. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences (Paris)*, Sér. B, Tom. 278, No. 10, 1974, p. 409-12. [Low frequency internal friction measurements on ice give peaks at low temperature which separate molecule reorientation from grain boundary effects.]
- ZAGÓRSKIY, Z. P., and GRODKOWSKI, J. Properties of the polycrystalline and glassy alkaline ice in the view of trapped electron mobilization by light. (In Dobó, J., and Hedvig, P., ed. *Proceedings of the third Tihany Symposium on Radiation Chemistry*. Vol. 2. Budapest, Akadémiai Kiadó, 1972, p. 1413-20.) [Ice doped with NaOH used and dependence of effect on dose and on additives studied.]

LAND ICE. GLACIERS. ICE SHELVES

- AIGELSCREITER, H., and NEUER, E. Die Pasterze in den Jahren 1963-1970. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 303-24. [Year-by-year detailed measurements on Pasterze and neighbouring glaciers (Austria) from 1963 to 1970.]
- AMBACH, W. Zum Strahlungshaushalt des grönländischen Inlandeises: vergleichende Studie im Akkumulations- und Ablationsgebiet. *Polarforschung*, Bd. 7, 43. Jahrg., Nr. 1-2, 1973, p. 10-22. [Comparative study of radiation fluxes in areas of accumulation and ablation of the Greenland ice cap.]
- AMBACH, W., and others. Markierungsversuche am innern Abfluss-system des Hintereisferners (Öztaler Alpen), von W. Ambach, H. Behrens, H. Bergman and H. Moser. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 137-45. [Discharge of melt water from glacier followed by dye method.]
- ANDERTON, P. W. Structural glaciology of a glacier confluence, Kaskawulsh Glacier, Yukon Territory, Canada. *Ohio State University. Institute of Polar Studies. Report No. 26*, 1973, xii, 109 p. [Study of deformation of surface ice at confluence of north and central arms of glacier with particular reference to relationship between optic-axis fabrics of the ice and deformation.]
- AUFDEMBERGE, T. P. Energy balance studies over glacier and tundra surfaces, summer, 1969. *Dissertation Abstracts International*, B, Vol. 33, No. 5, 1972, p. 2141-B. [Studies on ice surface of glacier and on tundra at similar elevations and exposures showed most marked difference was due to effect of sensible and latent heat fluxes. Abstract of Ph.D. thesis, University of Michigan, 1971. University Microfilms order no. 72-28994.]
- BESCHEL, R. E., and WEIDICK, A. Geobotanical and geomorphological reconnaissance in west Greenland, 1961. *Arctic and Alpine Research*, Vol. 5, No. 4, 1973, p. 311-19. [Study of plant succession in areas of recent glacier recession. Results interpreted to determine glacier behaviour where no documentation exists.]
- BIBRON, R., and others. Extra-terrestrial ^{53}Mn in Antarctic ice, [by] R. Bibron, R. Chesselet, G. Crozaz, G. Leger, J. P. Mennessier and E. [E.] Picciotto. *Earth and Planetary Science Letters*, Vol. 21, No. 2, 1974, p. 109-16. [Concludes that bulk of ^{53}Mn found near "Plateau" station is associated with interplanetary dust in which it had been produced by the action of solar protons on iron.]
- BITTMANN, O., and others. Die Ergebnisse der seismischen Gletschermessungen am Obersten Pasterzenboden (Glocknergruppe) im Jahre 1970, von O. Bittmann, E. Brückl, G. Ganzl, F. J. Wallner. *Arbeiten aus der Zentralanstalt für Meteorologie und Geodynamik*, Ht. 11, 1973, 17 p. (Zentralanstalt für Meteorologie und Geodynamik in Wien. Publikation Nr. 201.) [Presents results of seismic refraction measurements of thickness of Pasterze glacier, Austria, 1970.]

- BRAY, J. R. Glacial advance relative to volcanic activity since 1500 A.D. *Nature*, Vol. 248, No. 5443, 1974, p. 42-43. [Presents evidence suggesting that volcanic eruptions are followed by cold summers and then by glacier advances.]
- BRÜCKL, E. Zusammenhänge zwischen topographischen, elastischen und plastischen Größen von Gletschern. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 107-12. [Discusses results of investigation of 13 Austrian glaciers which yielded a statistical confirmation of certain relations between a characteristic parameter representing the flux of glacier ice per width of cross-section, the P-wave velocity of the ice, and the product of surface inclination and hydraulic radius.]
- BRUNNER, K., and RENTSCH, H. Die Änderungen von Fläche, Höhe und Volumen am Vernagt- und Goslarferner von 1889-1912-1938-1969. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 11-25. [Presents 3 maps (in separate map supplement) of this glacier system for 1889-1912, 1912-38 and 1938-69, each representing contour lines of glacier surveys. Changes in vertical shrinkage, volume and area allow individual behaviour of both glaciers to be analysed.]
- BUDD, W. F. The development of crystal orientation fabrics in moving ice. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 65-105. [Examines problem of determining large-scale mean distribution of crystal orientation fabrics throughout ice mass.]
- CORNER, R. W. M., and SMITH, R. I. L. Botanical evidence of ice recession in the Argentine Islands. *British Antarctic Survey Bulletin*, No. 35, 1973, p. 83-86. [Evidence of recent ice recession indicated by a band of relatively fresh, light-coloured rock, adjacent to the edge of the existing permanent ice, uncolonized by mosses or lichens.]
- DESIO, A., and others. Risultati di mezzo secolo di osservazioni sui ghiacciai del gruppo Ortles-Cevedale (Alpi Centrali), [by] A. Desio, S. Belloni, A. Giorcelli [and] G. Zanon. *Consiglio Nazionale delle Ricerche. Commissione Incaricata di Coordinare la Partecipazione Italiana al Decennio Idrologico Internazionale. Pubblicazione No. 6*, 1973, 107 p.+errata slip. [Results of half a century of investigation on the glaciers of the Ortles-Cevedale mountain group (central Alps); a summary of *I ghiacciai del Gruppo Ortles-Cevedale (Alpi Centrali)*. Torino, Palazzo Carignano, 1967. Text also given in English.]
- DUNBAR, M. J. Glaciers and nutrients in Arctic fiords. *Science*, Vol. 182, No. 4110, 1972, p. 398. [Comments upon S. Apollonio's study (*ibid.*, Vol. 180, No. 4085, 1973, p. 491-93), and suggests that up-welling action of glaciers on water is more likely to affect nitrate concentration in the water than an erosive action.]
- GANGL, G., and others. Verhalten und Eisvolumen der Pasterze (Glocknergruppe) in Beziehung zu den klimatischen Bedingungen, von G. Gangl, G. Skoda and F. J. Wallner. *Polarforschung*, Bd. 7, 43. Jahrg., Nr. 1-2, 1973, p. 1-9. [Presents index for the annual ablation of this glacier (Austria) from study of temperature records dating back to 1887. Further retreat seems likely.]
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ICEBERGS. SEA, RIVER AND LAKE ICE

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GLACIAL GEOLOGY

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- CARRARA, P. E., and ANDREWS, J. T. Problems and application of lichenometry to geomorphic studies, San Juan Mountains, Colorado. *Arctic and Alpine Research*, Vol. 5, No. 4, 1973, p. 373-84. [Investigations of talus, protalus ramparts, rock glaciers and end moraines.]
- CARVER, G. A. Glacial geology of the mountain lakes wilderness and adjacent parts of the Cascade Range, Oregon. *Dissertation Abstracts International*, B, Vol. 33, No. 12, Pt. 1, 1973, p. 5911-B. [Various deposits identified and differentiated. Abstract of Ph.D. thesis, University of Washington, 1972. University Microfilms order no. 73-13803.]
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- CHARLESWORTH, J. K. Stages in the dissolution of the last ice-sheet in Ireland and the Irish Sea region. *Proceedings of the Royal Irish Academy*, Sect. B, Vol. 73, No. 5, 1973, p. 79-86. [Reviews and assesses recent papers on extent and dissolution of Quaternary ice sheet.]
- DANILOV, I. D. Plastic and ruptural deformations in basin sediments. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 329-37. [Studies of marine and lacustrine Pleistocene deposits in northern West Siberia and Pechora lowlands show that deformations are common and of several types, and are unrelated to permafrost processes.]
- DANILOV, I. D. Subaqueous pseudomorphoses in Pleistocene deposits. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 339-45. [Describes wedge-shaped formations, probably due to melting of ice veins and subsequent filling in of resulting spaces with mineral or peat substratum. May occur in several stages depending on climatic conditions.]

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- DILAMARTER, R. R. Areal variations of selected topographic variables on glacial drift sheets of different ages in Iowa. *Dissertation Abstracts International*, B, Vol. 33, No. 7, 1973, p. 3131-B-32-B. [Abstract of Ph.D. thesis, University of Iowa, 1972. University Microfilms order no. 73-614.]
- DRAKE, L. D. Till fabric control by clast shape. *Geological Society of America. Bulletin*, Vol. 85, No. 2, 1974, p. 247-50. [Presents field data showing that pebble shape exerts a strong influence on its orientation in till.]
- FEDOROV, B. A. Podlednyy antarkticheskiy rel'yef v rayone stantsii Molodezhnoy [Subglacial Antarctic relief in the region of "Molodezhnaya" station]. *Trudy Sovetskoy Antarkticheskoy Ekspeditsii*, Tom 56, 1973, p. 121-24.
- FLINT, R. F. Present knowledge of late Cenozoic glaciation. *Biuletyn Peryglacjalny*, No. 23, 1973, p. 67-70. [Brief review.]
- FLIRI, F., and others. Weitere Ergebnisse der Forschung am Bänderton von Baumkirchen (Inntal, Nordtirol), von F. Fliri, H. Felber und H. Hilscher. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 203-13. [From investigations of laminated silts and clays it is possible to make some suggestions about the Würmian glaciation of the Inn valley.]
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- GANGLOFF, P. Le milieu morphoclimatique tardiglaciaire dans la région de Montréal. *Cahiers de Géographie de Québec*, Vol. 17, No. 42, 1973, p. 415-48. [Presents results of study of glacial geology of region and discusses climatic implications.]
- GEMMELL, A. M. D. The deglaciation of the island of Arran, Scotland. *Institute of British Geographers. Transactions*, No. 59, 1973, p. 25-39. [Discusses sequence of events from major readvance of about 13500 B.P. until end of glacial period.]
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- HEUBERGER, H. Die Salzburger "Friedhofterrasse"—eine Schlernterrasse? *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 237-51. [Casts doubt on the suggestion that this gravel terrace is connected with moraines of local valley glaciers.]
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- KANE, J., and others. Alpine glacial features of Mars. [by] J. Kane, J. Kasold, M. Suda, P. Metcalf, S. Caccamo. *Nature*, Vol. 244, No. 5410, 1973, p. 20-21. [Describes and discusses features caused by glacial erosion.]
- KAZI, A., and KNILL, J. Fissuring in glacial lake clays and tills on the Norfolk coast, United Kingdom. *Engineering Geology*, Vol. 7, No. 1, 1973, p. 35-48. [Describes orientation and origin. Attitudes of fissures are geometrically related to stress conditions associated with glacial loading and subsequent removal of overburden.]
- KRALL, D. B. Till stratigraphy and Olean ice retreat in east-central New York. *Dissertation Abstracts International*, B, Vol. 33, No. 4, 1972, p. 1619-B. [Study of tills, moraines and drumlin morphology enables Quaternary deglaciation to be followed. Abstract of Ph.D. thesis, Rutgers University, 1972. University Microfilms order no. 72-27566.]
- KRAUS, E. B. Comparison between ice age and present general circulations. *Nature*, Vol. 245, No. 5421, 1973, p. 129-33. [Argues against assumption that ice ages were characterized by a more vigorous atmospheric circulation and by an increased meridional heat transport.]
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- MCÉLHINNY, M. W., and others. Palaeomagnetic results and late Precambrian glaciations, [by] M. W. McElhinny, J. W. Giddings and B. J. J. Embleton. *Nature*, Vol. 248, No. 5449, 1974, p. 557-61. [Combined late Precambrian to early Palaeozoic polar wander path is derived for Gondwanaland, which suggests the latter existed at least 750 Ma ago. Widespread distribution of late Precambrian glaciations can be explained in terms of this polar migration.]
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- Society of America. Bulletin*, Vol. 84, No. 1, 1973, p. 161-70. [Lichenometrical, pedological and geological evidence used to establish chronology.]
- MAHANEY, W. Neoglacial chronology of the Fourth of July cirque, central Colorado Front Range: reply. *Geological Society of America. Bulletin*, Vol. 84, No. 11, 1973, p. 3767-72. [Comments upon J. Williams's suggestions (ibid., p. 3761-65).]
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- MILLER, G. H. Variations in lichen growth from direct measurements: preliminary curves for *Alectoria minuscula* from eastern Baffin Island, N.W.T., Canada. *Arctic and Alpine Research*, Vol. 5, No. 4, 1973, p. 333-39. [Comments upon technique for dating Neoglacial moraine sequence.]
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- ORENGO, C. Glaciaire et tardiglaciaire des vallées de la Mirière, des Merveilles et de Fontanalbe (Alpes maritimes). *Revue de Géographie Alpine*, Tom. 61, Fasc. 4, 1973, p. 583-99. [Describes and interprets glacial morphology of these valleys.]
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- SAUNDERS, G. E. Vistulian periglacial environments in the Lleyn Peninsula. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 257-69. [Climatic significance of periglacial phenomena in north-west Wales is considered in an attempt to assess the nature of the environments in which they were formed.]
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- SHCHERBAKOVA, YE. M. *Drevneye oledeneniye Bol'shogo Kavkaza* [Ancient glaciation of the Caucasus mountains]. Moscow, Izdatel'stvo Moskovskogo Universiteta, 1973. 271 p. [Describes glacial geology of region.]
- SHPOLANSKAYA, N. A., and YEYSEYEV, V. P. Domed-hummocky peatbogs of the northern taiga in western Siberia. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 271-83. [Field observations suggest these are relict formations of the late Holocene, developed as a result of water migration towards freezing soils and now degrading by the thawing from below of the frozen cores.]
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- [TILL.] [Uppsala symposium on till and till stratigraphy, 1972.] *Bulletin of the Geological Institutions of the University of Uppsala*, New Ser., Vol. 5, 1973, 215 p. [Contains the following papers: L.-K. Königsson, "The Uppsala symposium on till and till stratigraphy", p. 5; I. Th. Rosenqvist, "Sub-moraine deposits in Numedal", p. 7-12; E. Roaldset, "Sub-till sediments in the Numedal valley, southern Norway", p. 13-17; J. Lundqvist, "Dark bluish boulder-clay: a possible deposit from the first Würm glaciation", p. 19-20; A. Berthelsen, "Weichselian ice advances and drift successions in Denmark", p. 21-29; S. Sjørring, "Some problems in the till stratigraphy of the northeastern part of Sjælland", p. 31-35; L. A. Rasmussen, "The Quaternary stratigraphy and dislocations on Ven", p. 37-39; K. S. Petersen, "Tills in dislocated drift deposits on the Røsnæs peninsula, northwestern Sjælland, Denmark", p. 41-49; B. B. Bross, "The geotechnical aspects of moraine", p. 51-60; J. Hartlén, "The geotechnical characteristics of moraine clays related to their structure", p. 61-68; O. Fr. Bergersen, "The roundness analysis of stones. A neglected aid in till studies", p. 69-79; K. Garnes, "Till studies in the Gudbrandsdal area, eastern central Norway", p. 81-92; H. Bahnon, "Lithological investigations in some Danish boulder-clay profiles", p. 93-109; K. Binzer, "Trace elements in Danish tills", p. 111-15; J. Krüger, "Operator variance in orientation measurements in till macrofabric analyses. An experimental study", p. 117-25; U. Thøregren, "A seismic refraction study of a complex accumulation in Ångersjö, southern Västerbotten", p. 127-29; H. G. Johansson, "The genesis of the complex accumulation in Ångersjö, southern Västerbotten", p. 131; H. Minell, "An investigation of drumlins in the Narvik area of Norway", p. 133-38; Å. Hillefors, "The stratigraphy and genesis of stoss- and lee-side moraines", p. 139-54; K. Moreborg, "Limestone determinations of till in the Gävle region", p. 155; K. Eriksson, "The distribution of some metals in different till fractions", p. 157-64; N. Spjeldnæs, "Moraine stratigraphy, with examples from the basal Cambrian ('Eocambrian') and Ordovician glaciations", p. 165-71; P. B. Konradi,

- "Foraminiferas in some Danish glacial deposits", p. 173-75; I. Marcussen, "Stones in Danish tills as a stratigraphical tool. A review", p. 177-81; M. Markgren, "Problems of moraine stratigraphy", p. 183-97; N.-A. Mörner, "Till stratigraphy in North America and northern Europe", p. 199-207; E. Mohrén, "The drift beds of western Skåne in southern Sweden", p. 209-15.]
- UNWIN, D. J. The distribution and orientation of corries in northern Snowdonia, Wales. *Institute of British Geographers. Transactions*, No. 58, 1973, p. 85-97. [Analyses and describes significant regularities in attempt to identify factors controlling mountain glaciation.]
- VEYRET, Y. Note préliminaire à l'étude morphologique des marges du glacier de l'Artense (Massif Central). *Revue de Géographie Alpine*, Tom. 61, Fasc. 2, 1973, p. 203-21. [Many glacio-fluvial formations were noted, but a sequence of events leading to their development was difficult to define.]
- VORREN, T. O. Glacial geology of the area between Jostedalbreen and Jotunheimen, south Norway. *Norges Geologiske Undersøkelse*, Nr. 291, *Bulletin* 16, 1973, 46 p. [Reconstructs ice movement and course of deglaciation.]
- WAITT, R. B., jr. Geomorphology and glacial geology of the Methow drainage basin, eastern North Cascade Range, Washington. *Dissertation Abstracts International*, B, Vol. 33, No. 12, Pt. 1, 1973, p. 5920-B-21-B. [Conclusions about the glaciation of this region are drawn from a study of the features. Abstract of Ph.D. thesis, University of Washington, 1972. University Microfilms order no. 73-13896.]
- WEBBER, P. J., and ANDREWS, J. T. Lichenometry: a commentary. *Arctic and Alpine Research*, Vol. 5, No. 4, 1973, p. 295-302. [Describes technique and applications, mainly to glacial geology.]
- WEYMARN, J. VON, and EDWARDS, K. J. Interstadial site on the island of Lewis, Scotland. *Nature*, Vol. 246, No. 5434, 1973, p. 473-74. [Thin layer of organic detritus found beneath glacial till was radiocarbon dated to 27333 ± 240 B.P. Pollen analysis indicates a temperate climate.]
- WILLIAMS, J. Neoglacial chronology of the Fourth of July cirque, central Colorado Front Range: discussion. *Geological Society of America. Bulletin*, Vol. 84, No. 11, 1973, p. 3761-65. [Presents alternative interpretation and chronology to that of Mahaney (*ibid.*, Vol. 84, No. 1, 1973, p. 161-70).]

FROST ACTION ON ROCKS AND SOIL. FROZEN GROUND. PERMAFROST

- ALEKSEYEV, M. N., and others. Sur les formations périglaciaires du Pléistocène dans la partie Nord de l'Asie Orientale, [by] M. N. Alekseyev, R. Ye. Giterman, L. V. Golubeva. *Biuletyn Peryglacjalny*, No. 23, 1973, p. 37-50. [Outlines periglacial features of north-eastern U.S.S.R.]
- ALTER, A. J. Water supply and waste disposal concepts applicable in permafrost regions. *Permafrost. Second International Conference*. . . 1973, 1973, p. 577-81. [General discussion of problems.]
- ALVAREZ, R. Permafrost: relation between ice content and dielectric losses at 100° K. *Earth and Planetary Science Letters*, Vol. 20, No. 3, 1973, p. 409-14. [Results show feasibility of determining ice content in permafrost by electromagnetic means.]
- ANDERSON, D. M., and MORGENSTERN, N. R. Physics, chemistry, and mechanics of frozen ground: a review. *Permafrost. Second International Conference*. . . 1973, 1973, p. 257-88. [Describes developments since 1963, with emphasis on studies in North America.]
- ANDERSON, D. M., and TICE, A. R. Predicting unfrozen water contents in frozen soil from surface area measurements. *Highway Research Record*, No. 393, 1972, p. 12-18. [Empirical equation derived which is accurate enough for normal engineering requirements.]
- ANDERSON, D. M., and others. An examination of Mariner 6 and 7 imagery for evidence of permafrost terrain on Mars, [by] D. M. Anderson and L. W. Gatto [and] F. C. Ugolini. *Permafrost. Second International Conference*. . . 1973, 1973, p. 499-508. [Permafrost terrain described and compared with similar features on Earth.]
- ANDERSON, D. M., and others. The unfrozen water and the apparent specific heat capacity of frozen soils, [by] D. M. Anderson, A. R. Tice and H. L. McKim. *Permafrost. Second International Conference*. . . 1973, 1973, p. 289-95. [Presents equation for predicting apparent specific heat capacity and cumulative heat absorption versus temperature curve of frozen soils from their water-ice phase composition data.]
- BERG, R. L., and AITKEN, G. W. Some passive methods of controlling geocryological conditions in roadway construction. *Permafrost. Second International Conference*. . . 1973, 1973, p. 581-86. [Most effective technique was to paint the road white.]
- BERTOUILLE, H. Résolution simple de problèmes de thermo-cinétique dans les sols. Application à la cryoclastic. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 7-47. [Study of frost fractures in soils. From examination of horizontal fossil cracks, it is possible to estimate the severity of Quaternary winters.]
- BIRD, E. C. F. The periglacial legacy in the landforms of the Weymouth lowland (south-central England). *Biuletyn Peryglacjalny*, No. 22, 1973, p. 315-21. [Effects of periglaciation, although limited, are evaluated and discussed.]
- BIRKELAND, P. W. Use of relative age-dating methods in a stratigraphic study of rock glacier deposits, Mt. Sopris, Colorado. *Arctic and Alpine Research*, Vol. 5, No. 4, 1973, p. 401-16. [Data from lichens, rock weathering and soils were used and compared. No single method was adequate, but a combination of all three provided the best estimate of age.]
- BLACK, R. F. Growth of patterned ground in Victoria Land, Antarctica. *Permafrost. Second International Conference*. . . 1973, 1973, p. 193-203. [Presents results of measurements made at 14 sites over interval of 6-8 years, and discusses their significance. Most of the patterned ground here dates within the last 5000 years.]
- BOUT, P., and GODARD, A. Aspects du modelé périglaciaire en Scandinavie du Nord. Problèmes de genèse, comparaisons. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 49-79. [Study of periglacial forms in northern Scandinavia, in particular, palsas, boulder pavements, stratified slope deposits, and boulder fields and runs.]

- BRANDT, G. H. Chemical additives to reduce frost heave and water accumulation in soils. *Highway Research Record*, No. 393, 1972, p. 30-44. [Describes use of soil waterproofing chemicals in dry and moist soils, with particular reference to 4-tert-butylcatechol. Discussion, p. 42-44.]
- BROWN, J. Environmental considerations for the utilization of permafrost terrain. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 587-90. [General discussion of the situation.]
- BROWN, R. J. E. Influence of climatic and terrain factors on ground temperatures at three locations in the permafrost region of Canada. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 27-34. [Measurements made down to 15 m depth at Thompson, Manitoba, Yellowknife, Northwest Territories, and Devon Island, Queen Elizabeth Islands, Canadian Arctic Archipelago.]
- BROWN, R. J. E., and PÉWÉ, T. L. Distribution of permafrost in North America and its relationship to the environment: a review, 1963-1973. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 71-100. [Extensive review of recent progress.]
- CAILLEUX, A. Éolisations périglaciaires Quaternaires au Canada. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 81-115. [Discusses action of wind on soils and rocks during the Quaternary in Canada.]
- CAILLEUX, A. Répartition et signification des différents critères d'éolisation périglaciaire. *Biuletyn Peryglacjalny*, No. 23, 1973, p. 51-63. [Discusses effects of wind on periglacial features during the Quaternary.]
- CHAMBERLAIN, E. Mechanical properties of frozen ground under high pressure. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 295-305. [Discusses and reports results of recent high-pressure triaxial compression tests and isothermal compressibility tests.]
- COHEN, J. B. Solid waste disposal in permafrost areas. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 590-98. [General discussion of problems.]
- COLLARD, M. Cryoturbations en forme de stries enracinées parallèles à la pente. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 324-27. [Describes periglacial features in the form of stripes of debris running parallel to the slope of the ground which were observed in a trench excavated in the Belgian Ardennes and were probably formed during the Quaternary.]
- CRAMPTON, C. B. A landscape zonation for the southern and central Mackenzie River valley based on terrain permafrost characteristics. *Canadian Journal of Earth Sciences*, Vol. 10, No. 12, 1973, p. 1843-54. [Describes method and how to interpret results.]
- CRAMPTON, C. B., and RUTTER, N. W. A geoecological terrain analysis of discontinuously frozen ground in the upper Mackenzie River valley, Canada. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 101-05. [Describes various terrain conditions and how permafrost characteristics may be identified from air photographs.]
- CROXY, F. E. Settlement associated with the thawing of permafrost. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 599-607. [Discusses practical methods of determining and predicting settlement on thawing.]
- CZUDEK, T., and DEMEK, J. The valley cryopediments in eastern Siberia. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 117-30. [Study of present-day slope development in this area of continuous permafrost.]
- DERBYSHIRE, E. Periglacial phenomena in Tasmania. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 131-48. [Study of talus, solifluction debris, rock glaciers, nivation cirques, protalus moraines and bedded scree of late Quaternary age and some presently active periglacial forms, and their climatic implications.]
- DINGMAN, S. L. Effects of permafrost on stream flow characteristics in the discontinuous permafrost zone of central Alaska. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 447-53. [Studies at Glenn Creek watershed, near Fairbanks.]
- DINGMAN, S. L., and KOUTZ, F. R. Relations among vegetation, permafrost, and potential insolation in central Alaska. *Arctic and Alpine Research*, Vol. 6, No. 1, 1974, p. 37-47. [Detailed description of occurrence of permafrost and discussion of factors affecting this.]
- DUNN, J. R., and HUDEC, P. P. Frost and sorption effects in argillaceous rocks. *Highway Research Record*, No. 393, 1972, p. 65-78. [Concludes that sorptive interactions with water vapour or liquid water are more destructive of aggregate materials than is freezing and thawing.]
- ESCH, D. C. Control of permafrost degradation beneath a roadway by subgrade insulation. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 608-22. [Roadway fill sections constructed over frozen peat subgrade with 5.1 and 10.2 cm layers of extruded polystyrene foam insulation board have performed well during three years, surface settlement being very small and uniform.]
- FAHEY, B. D. Seasonal frost heave and frost penetration measurements in the Indian Peaks region of the Colorado Front Range. *Arctic and Alpine Research*, Vol. 6, No. 1, 1974, p. 63-70. [Presents observations which show that rates of frost heave were correlated in a weak but positive manner with rates of frost penetration.]
- FERRIANS, O. J., jr., and HOBSON, G. D. Mapping and predicting permafrost in North America: a review, 1963-1973. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 479-98. [Canada and Alaska.]
- FRENCH, H. M. Cryopediments on the chalk of southern England. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 149-56. [Distinguishes between cryopediments and cryoplanation terraces, and discusses their presence in the dry chalk valleys where their preservation may reflect the lack of present-day fluvial modification.]
- FRENCH, H. M. Mass-wasting at Sachs Harbour, Banks Island, N.W.T., Canada. *Arctic and Alpine Research*, Vol. 6, No. 1, 1974, p. 71-78. [Rates of movement observed are similar to those in other periglacial environments: sub-surface between 1.4 and 1.7 cm/year and surface about 2.5 cm/year.]
- FRENCH, H. M., and EGGINTON, P. Thermokarst development, Banks Island, western Canadian Arctic. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 203-12. [Description, based on recent field work.]
- FULWIDER, C. W. Thermal regime in an Arctic earthfill dam. *Permafrost. Second International Conference. . . . 1973*, 1973, p. 622-28. [Presents details of construction and temperature conditions within this dam at Thule, Greenland, during a six-year period.]
- GARG, O. P. *In situ* physicommechanical properties of permafrost using geophysical techniques. *Permafrost.*

- Second International Conference*. . . 1973, 1973, p. 508-17. [Possible to use seismic refraction resistivity surveys, but detailed laboratory investigations on variation of seismic velocities and resistivity as function of temperature are required for complete accuracy.]
- GASKIN, D. A., and STANLEY, L. E. Control of culvert icing. *Permafrost. Second International Conference*. . . 1973, 1973, p. 629-36. [Describes field and laboratory studies using electric heat cables.]
- GEORGE, W. Analysis of the proposed Little Chena River, earthfilled nonretention dam, Fairbanks, Alaska. *Permafrost. Second International Conference*. . . 1973, 1973, p. 636-48. [Dam to be located in area of marginal permafrost and will be used only for temporary storage of water to prevent flooding. Presents plans and discusses problems.]
- GILL, D. A spatial correlation between plant distribution and unfrozen ground within a region of discontinuous permafrost. *Permafrost. Second International Conference*. . . 1973, 1973, p. 105-13. [Study of taliks and their effect on vegetation in the Mackenzie Delta.]
- GOLD, L. W., and LACHENBRUCH, A. H. Thermal conditions in permafrost—a review of North American literature. *Permafrost. Second International Conference*. . . 1973, 1973, p. 3-25. [Discusses the surface boundary condition and subsurface thermal conditions. Appendix by L. E. Goodrich on use of computerized numerical methods for ground temperature calculations, p. 23-25.]
- GRANBERG, H. B. Indirect mapping of the snowcover for permafrost prediction at Schefferville, Quebec. *Permafrost. Second International Conference*. . . 1973, 1973, p. 113-20. [Two techniques have been found useful: the development of a statistical model and the use of sequences of air photographs.]
- GRANHOLM, H. Om frostens nedträngande i marken med särskild hänsyn till möjligheten att förhindra tjälskador. *Chalmers Tekniska Högskolas Handlingar*, Nr. 332, 1971, 83 p. [Study of frost penetration in soil with particular reference to prevention of frost damage to constructions. English summary, p. 80-81.]
- HARRIS, A. R. Effect of deciduous, coniferous, and abandoned field cover on the hydrologic properties and frost morphology of frozen soil. *Dissertation Abstracts International*, B, Vol. 33, No. 1, 1972, p. 16-B-17-B. [Abstract of Ph.D. thesis, University of Minnesota, 1972. University Microfilms order no. 72-201111.]
- HASTENRATH, S., and WILKINSON, J. A contribution to the periglacial morphology of Lesotho, southern Africa. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 157-67. [Describes active and fossil periglacial forms found between 1800 and 3485 m, and relates to climate.]
- HEGINBOTTOM, J. A. Some effects of surface disturbance on the permafrost active layer at Inuvik, N.W.T., Canada. *Permafrost. Second International Conference*. . . 1973, 1973, p. 649-57. [Factor that overrides all others in controlling effects of any terrain disturbance on the permafrost active layer is the intensity of any previous disturbance; variations due to different original terrain conditions are much less.]
- HEINER, A. Strength and compaction properties of frozen soil. *National Swedish Building Research. Document*, D11 : 1972, 1972, [120] p. [Strength of frozen soil increased with decreasing temperature and increasing water content, while compaction decreased. Compaction improved by increasing compaction energy.]
- HENNING, F. B., and LOBACZ, E. F. Corps of Engineers technology related to design of pavements in areas of permafrost. *Permafrost. Second International Conference*. . . 1973, 1973, p. 658-64. [Discusses problems in building roads in areas of permafrost.]
- HOAR, C. L., and CLARK, L. K. A sanitary service complex for villages in permafrost regions: a demonstration project at Wainwright, Alaska. *Permafrost. Second International Conference*. . . 1973, 1973, p. 664-73. [Describes design and operation of central building containing source of community water supply, waste disposal system and laundry facility, with drive-through passage for vehicle making deliveries to and collections from homes in village of 350 inhabitants.]
- HOEKSTRA, P., and McNEILL, D. Electromagnetic probing of permafrost. *Permafrost. Second International Conference*. . . 1973, 1973, p. 517-26. [Describes use of ground and airborne low frequency electromagnetic sensors for mapping electrical resistivity of ground. Also summarizes existing knowledge of resistivity of permafrost with emphasis on temperature dependence.]
- HUGHES, T. J. Glacial permafrost and Pleistocene ice ages. *Permafrost. Second International Conference*. . . 1973, 1973, p. 213-23. [Discusses past and present (predicted) glacial permafrost in the northern hemisphere.]
- HUNTER, J. A. M. The application of shallow seismic methods to mapping of frozen surficial materials. *Permafrost. Second International Conference*. . . 1973, 1973, p. 527-35. [Methods successfully applied to permafrost studies. Depth less than 30 m.]
- IVANOV, N. S., and others, ed. *Eksperimental'nyye issledovaniya protsessov teploobmena v merzlykh gornyykh porod* [Experimental research into heat exchange processes in frozen rocks]. [Edited by] N. S. Ivanov, A. V. Pavlov, L. V. Chistotinov. Moscow, Izdatel'stvo "Nauka", 1972. 178 p. [Collection of 24 articles.]
- IVES, J. D. Permafrost and its relationship to other environmental parameters in a midlatitude, high-altitude setting, Front Range, Colorado Rocky Mountains. *Permafrost. Second International Conference*. . . 1973, 1973, p. 121-25. [Present conclusions relating to this environment.]
- JAHNS, H. O., and others. Permafrost protection for pipelines, [by] H. O. Jahns, T. W. Miller, L. D. Power, W. P. Rickey, T. P. Taylor and J. A. Wheeler. *Permafrost. Second International Conference*. . . 1973, 1973, p. 673-84. [Number of recommendations made.]
- JOHN, B. S. Vistulian periglacial phenomena in south-west Wales. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 185-212. [Presents four hypotheses concerning the development and preservation of periglacial phenomena in Pembrokeshire and relates to field evidence. Discussion, p. 211-12.]
- JUDGE, A. S. Deep temperature observations in the Canadian north. *Permafrost. Second International Conference*. . . 1973, 1973, p. 35-40. [Results from borehole measurements show thickest permafrost recorded at Winter Harbour, Melville Island, at 530 m depth.]
- JUMIKIS, A. R. Effect of porosity on amount of soil water transferred in a freezing silt. *Permafrost. Second International Conference*. . . 1973, 1973, p. 305-10. [Results illustrate importance of porosity of freezing soil on

- the amount of soil moisture transferred by the thermo-osmotic flow process by way of the water-film mechanism from groundwater to the cold front.]
- KACHADOORIAN, R., and FERRIANS, O. J., jr. Permafrost-related engineering geology problems posed by the trans-Alaska pipeline. *Permafrost. Second International Conference*. . . 1973, 1973, p. 684-87. [Outlines engineering problems in preserving the environment.]
- KANE, D. L., and SLAUGHTER, C. W. Recharge of a central Alaska lake by subpermafrost groundwater. *Permafrost. Second International Conference*. . . 1973, 1973, p. 458-62. [Demonstrates existence of unfrozen ground beneath lake surrounded by permafrost and recharge of lake from sub-permafrost aquifers through this ground.]
- KANE, D. L., and others. Groundwater pore pressures adjacent to subarctic streams, [by] D. L. Kane and R. F. Carlson [and] C. E. Bowers. *Permafrost. Second International Conference*. . . 1973, 1973, p. 453-58. [Presents results of measurements over 12-month period of pore water pressure and boundary conditions in the vicinity of two sub-Arctic streams in a permafrost-dominated environment.]
- KATASONOV, E. M. Classification of frost-caused phenomena with references to the genesis of the sediments in central Yakutia. *Biuletyn Peryglacjalny*, No. 23, 1973, p. 71-80. [Divides cryogenic phenomena into subterranean and correlated surface structures according to the conditions in which the deposits were accumulated and frozen.]
- KATASONOV, E. M. Present-day ground- and ice veins in the region of the middle Lena. *Biuletyn Peryglacjalny*, No. 23, 1973, p. 81-89. [Observations on development of periglacial features in central Yakutiya throw light on conditions leading to the formation of similar features during the Pleistocene.]
- KLIEWER, R. M. A general solution for the two-dimensional, transient heat conduction problem in permafrost, using implicit, finite difference methods. *Permafrost. Second International Conference*. . . 1973, 1973, p. 41-51. [Presents computer programming technique for modelling mathematically a large class of problems involving the thermal response of a permafrost medium.]
- KONISHCHEV, V. N., and others. Cryogenic processes as reflected in ground microstructure, [by] V. N. Konishchev, M. A. Faustova, V. V. Rogov. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 213-19. [Presents observations on the microstructure of clay rock subjected to repeated freezing and thawing with particular reference to loess-like cover of the Bol'shezemel'skaya Tundra, and describes features of glacial deposits which may be of a cryogenic nature.]
- KOSTYAYEV, A. G. Some rare varieties of stone circles. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 347-52. [May be due to hydrodynamic action rather than to periglacial causes.]
- KUZNECOVA, T. P. Special features of cryolithogenesis in the alluvial plains, central Yakutia. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 221-31. [Describes some periglacial features in this area of continuous permafrost.]
- LABA, J. T., and AZIZ, K. A. Pressure-time relationship in laterally stressed frozen granular soils. *Highway Research Record*, No. 393, 1972, p. 79-87. [Study of general tendency in which the lateral stress in frozen sand samples that were subjected to radial pressure at constant temperatures diminishes with time. Reduction in lateral stress was correlated with temperature, degree of ice saturation, porosity, initial pressure and time.]
- LADANYI, B., and JOHNSTON, G. H. Evaluation of *in situ* creep properties of frozen soils with the pressuremeter. *Permafrost. Second International Conference*. . . 1973, 1973, p. 310-18. [Field tests showed that the Ménard pressuremeter was suitable for use in conditions found at Thompson, Manitoba. Some problems in interpreting results are discussed.]
- LAGAREG, D. Éléments de la morphologie cryogène du golfe de Richmond, Nouveau-Québec. *Cahiers de Géographie de Québec*, Vol. 17, No. 42, 1973, p. 465-82. [Study of periglacial phenomena and major landforms of region enables classification of cryogenic and thermokarst features to be made.]
- LAGAREG, D. Postglacial permafrost features in eastern Canada. *Permafrost. Second International Conference*. . . 1973, 1973, p. 126-31. [Study of landforms, especially polygons, associated with former existence of permafrost, mainly in Quebec.]
- LANGE, G. R. Investigation of sampling perennially frozen alluvial gravel by core drilling. *Permafrost. Second International Conference*. . . 1973, 1973, p. 535-41. [Practical problems.]
- LARSON, D. B., and others. Shock-wave studies of ice and two frozen soils, [by] D. B. Larson, G. D. Bearson and J. R. Taylor. *Permafrost. Second International Conference*. . . 1973, 1973, p. 318-25. [Investigates loading and unloading characteristics of frozen materials in stress range 0-15 kbar and thus determines the effect that reaction kinetics and a soil matrix have upon the equations of state of frozen materials.]
- LESCHACK, L. A., and others. Potential use of airborne dual-channel infrared scanning to detect massive ice in permafrost, [by] L. A. LeSchack, F. H. Morse, W. R. Brimley, Jr., N. G. Ryan and R. B. Ryan. *Permafrost. Second International Conference*. . . 1973, 1973, p. 542-49. [Method is possible for detecting ice in upper 2.5 to 3 m of permafrost.]
- LEWELLEN, R. I. The occurrence and characteristics of nearshore permafrost, northern Alaska. *Permafrost. Second International Conference*. . . 1973, 1973, p. 131-36. [Study, based on field measurements, of under-sea permafrost between Cape Beaufort and Demarcation Point.]
- LINELL, K. A. Long-term effects of vegetative cover on permafrost stability in an area of discontinuous permafrost. *Permafrost. Second International Conference*. . . 1973, 1973, p. 688-93. [At Fairbanks, Alaska, (permafrost 30 m deep) only the undisturbed tree-covered test section remained free from permafrost degradation over 26 years' observation. In cleared and stripped sections, degradation still continues.]
- LINELL, K. A. Risk of uncontrolled flow from wells through permafrost. *Permafrost. Second International Conference*. . . 1973, 1973, p. 462-68. [Describes case history from Fairbanks, Alaska, when water well was drilled in 1946, and discusses how subsequent events might have been prevented.]
- LINELL, K. A., and JOHNSTON, G. H. Engineering design and construction in permafrost regions: a review. *Permafrost. Second International Conference*. . . 1973, 1973, p. 553-75. [North America.]

- LONG, E. L. Designing friction piles for increased stability at lower installed cost in permafrost. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 693-99. [Recommendations made, based on author's and others' work.]
- LUSCHER, U., and AFIFI, S. S. Thaw consolidation of Alaskan silts and granular soils. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 325-34. [Presents results of extensive laboratory investigations.]
- MCGAW, R. Frost heaving versus depth to water table. *Highway Research Record*, No. 393, 1972, p. 45-55. [Describes laboratory investigation of the influence of water table depth on the freezing characteristics of four soil types ranging from gravelly sand to sandy clay.]
- MCGINNIS, L. D., and others. Geophysical identification of frozen and unfrozen ground, Antarctica, [by] L. D. McGinnis, K. Nakao, C. C. Clark. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 136-46. [Studies in the dry valleys of Victoria Land revealed abnormally thin permafrost with respect to climate, probably due to presence of solar-heated lakes and to high water and soil salinities.]
- MACKAY, J. R. Problems in the origin of massive icy beds, western Arctic, Canada. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 223-28. [Considers that massive bodies of segregated ice could grow at depth, in the same manner as that of segregated ice in pingos.]
- MACKAY, J. R., and BLACK, R. F. Origin, composition, and structure of perennially frozen ground and ground ice: a review. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 185-92. [Mainly with reference to North America.]
- MACKAY, J. R., and MATHEWS, W. H. Needle ice striped ground. *Arctic and Alpine Research*, Vol. 6, No. 1, 1974, p. 79-84. [Stripe orientations shown to develop parallel to shadows cast by sun when needle ice, with soil cap, thaws and collapses.]
- MCVEE, C. V. Permafrost considerations in land use planning management. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 146-51. [General discussion of problems.]
- MAININI, G. Osservazioni scientifiche nel distretto di Angmagssalik, Groenlandia orientale. *Il Polo*, An. 29, No. 4, 1973, p. 89-98. [Includes results of studies of frozen ground.]
- MARTINI, A. Experimental investigations of frost weathering on granites. *Studia Geographica*, 33, 1973, p. 61-66. [Discusses results of laboratory studies.]
- MELLOR, M. Mechanical properties of rocks at low temperatures. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 334-44. [Emphasizes importance of pore size and water content, which can affect strength and deformability.]
- MEL'NIKOV, P. I., and others. Geotermicheskiye issledovaniya v sentral'noy Yakutii [Geothermal research in central Yakutiya]. [By] P. I. Mel'nikov, V. T. Balobayev, I. M. Kutasov, V. N. Devyatkin. *Geologiya i Geofizika*, 1972, No. 12, p. 134-37. [Study of heat flow from frozen and thawed zones.]
- MILLER, R. D. Freezing and heaving of saturated and unsaturated soils. *Highway Research Record*, No. 393, 1972, p. 1-11. [Theoretical considerations.]
- MILLER, R. D. Soil freezing in relation to pore water pressure and temperature. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 344-52. [Mathematical analysis.]
- MOORE, D. G. Nitrate movement in freezing or frozen soils. *Dissertation Abstracts International*, B, Vol. 33, No. 7, 1973, p. 2888-B. [Laboratory and field investigations of effect of various temperatures and temperature gradients on nitrate movement in several types of soil. Abstract of Ph.D. thesis, South Dakota State University, 1972. University Microfilms order no. 72-33333.]
- MURRMANN, R. P. Ionic mobility in permafrost. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 352-59. [Was investigated directly by determining sodium ion diffusion coefficients and indirectly by measuring electrical conductance. Results define diffusion rates, determine how soil parameters affect ion migration, and provide information about the nature of unfrozen water in frozen soil.]
- NAKANO, Y., and FROULA, N. H. Sound and shock transmission in frozen soils. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 359-69. [Presents and interprets results of investigation by ultrasonic technique, and discusses behaviour of frozen soils under shock compression by use of gas gun.]
- NICHOLSON, F. H., and GRANBERG, H. B. Permafrost and snowcover relationships near Schefferville. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 151-58. [Studies at site in Quebec underlain by discontinuous permafrost showed that snow is the most important factor controlling permafrost distribution in this area, and there is a linear relationship between ground temperatures and snow depth.]
- NICHOLSON, F. H., and THOM, B. G. Studies at the Timmins 4 permafrost experimental site. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 159-66. [Describes research at this site underlain by discontinuous permafrost near Schefferville, Quebec.]
- NIXON, J. F., and MORGENSTERN, N. R. Practical extensions to a theory of consolidation for thawing soils. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 369-77. [Considers problems where thaw depth is not simply proportional to the square root of time, and problems where the change of void ratio of the soil bears a semi-logarithmic relationship with the change in effective stress.]
- NIXON, J. F., and MORGENSTERN, N. R. Thaw-consolidation tests on undisturbed fine-grained permafrost. *Canadian Geotechnical Journal*, Vol. 11, No. 1, 1974, p. 202-14. [Settlements, pore water pressures and rates of thaw were measured in a series of tests on undisturbed Arctic soils. Results were interpreted in the light of current theories of heat transfer and thaw-consolidation.]
- OUTCALT, S. I. A simulation sensitivity analysis of the needle ice growth environment. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 228-34. [Points out both practical and theoretical value of this analysis.]
- PENNER, E. Influence of freezing rate on frost heaving. *Highway Research Record*, No. 393, 1972, p. 56-64. [Stresses importance of the rate at which the soil is frozen and its effect on mobilizing moisture flow.]
- PETTIBONE, H. C. Stability of an underground room in frozen gravel. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 699-706. [Discusses mine construction in frozen gravel, and problems encountered in year-round operation when temperatures are above freezing in summer.]

- PÉWÉ, T. L., and SELLMANN, P. V. Geochemistry of permafrost and Quaternary stratigraphy. *Permafrost. Second International Conference*. . . 1973, 1973, p. 166-70. [Preliminary analyses of frozen sediments and ice from northern and central Alaska suggest that the chemical investigation of frozen ground holds great potential for gross correlations in permafrost regions.]
- PISSART, A. Les études expérimentales de l'action du gel voie de recherche d'avenir. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 233-47. [Reviews recent experimental work on the formation of periglacial features.]
- PISSART, A. Résultats d'expériences sur l'action du gel dans le sol. *Biuletyn Peryglacjalny*, No. 23, 1973, p. 101-13. [Describes laboratory experiments.]
- POPOV, A. I. Genetic systematics of periglacial formations. *Biuletyn Peryglacjalny*, No. 23, 1973, p. 115-24. [Discusses properties and types of cryolithogenesis, and describes forms of thermokarst.]
- PRICE, L. W. Rates of mass wasting in the Ruby Range, Yukon Territory. *Permafrost. Second International Conference*. . . 1973, 1973, p. 235-45. [Rates appear to be less than those recorded for other solifluctional areas, about 1-3 cm/year.]
- RADD, F. J., and OERTLE, D. H. Experimental pressure studies of frost heave mechanisms and the growth-fusion behavior of ice. *Permafrost. Second International Conference*. . . 1973, 1973, p. 377-84. [Experimental and theoretical studies of basic frost heave mechanisms. Shows that ice lens formation is simply a special form of crystal growth.]
- RAYNAL, R. Quelques vues d'ensemble à propos du périglaciaire pléistocène des régions riveraines de la Méditerranée occidentale. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 249-56. [Reviews recent periglacial evidence on the Pleistocene of areas bordering on the western Mediterranean.]
- REED, S. C., and BUZZELL, T. D. A sewage-treatment concept for permafrost areas. *Permafrost. Second International Conference*. . . 1973, 1973, p. 706-12. [Describes effective inexpensive single-tank treatment system.]
- RICHTER, H. G. Main lines of the regional structure of periglacial facies on the territory of the G.D.R. *Biuletyn Peryglacjalny*, No. 23, 1973, p. 125-33. [Describes the pattern of periglacial facies formed at the time of the Vistula glaciation in what is now known as the German Democratic Republic.]
- ROMANOVSKIY, N. N. Regularities in formation of frost-fissures and development of frost-fissure polygons. *Biuletyn Peryglacjalny*, No. 23, 1973, p. 237-77. [Study of development of frost cracks.]
- ROWLEY, R. K., and others. Vertical and lateral pile load tests in permafrost, [by] R. K. Rowley and G. H. Watson [and] B. Ladanyi. *Permafrost. Second International Conference*. . . 1973, 1973, p. 712-21. [Analyses mathematically problems of constructing piles for supporting pipelines in frozen ground.]
- RYAN, W. L. Design and construction of practical sanitation facilities for small Alaskan communities. *Permafrost. Second International Conference*. . . 1973, 1973, p. 721-30. [Describes and discusses some of the installations currently in use and makes some general conclusions.]
- SAYLES, F. H. Triaxial and creep tests on frozen Ottawa sand. *Permafrost. Second International Conference*. . . 1973, 1973, p. 384-91. [Study of effects of hydrostatic confining pressure and rate of applied load on strength and deformation characteristics of frozen sands and assessment of relative influence of cohesion of ice matrix versus friction between particles of sand.]
- SELLMANN, P. V., and BROWN, J. Stratigraphy and diagenesis of perennially frozen sediments in the Barrow, Alaska, region. *Permafrost. Second International Conference*. . . 1973, 1973, p. 171-81. [Investigations enable conclusions to be made about the late Quaternary history of the northern Alaskan Arctic coastal plain.]
- SHERMAN, R. G. A groundwater supply for an oil camp near Prudhoe Bay, Arctic Alaska. *Permafrost. Second International Conference*. . . 1973, 1973, p. 469-72. [Tests show that a year-round supply of water exists in an alluvial aquifer beneath a large Arctic stream.]
- SISKO, R. K. Osobennosti sezonnotalogo sloya Novosibirskogo arhipelaga [Features of the seasonally thawed layer of the Novosibirsk archipelago]. *Trudy Arkhticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 318, 1973, p. 100-13. [Detailed study of local factors affecting thawing of ground.]
- SMITH, M. W., and HWANG, C. T. Thermal disturbance due to channel shifting, Mackenzie Delta, N.W.T., Canada. *Permafrost. Second International Conference*. . . 1973, 1973, p. 51-60. [Study of geomorphological pattern of permafrost distribution under shifting river channel and analysis of problem quantitatively in framework of heat conduction theory.]
- SMITH, N., and BERG, R. Encountering massive ground ice during road construction in central Alaska. *Permafrost. Second International Conference*. . . 1973, 1973, p. 730-36. [Presents recommendations for making cuts through ice-rich soils.]
- SMITH, N., and others. The use of polyurethane foam plastics in the construction of expedient roads on permafrost in central Alaska, [by] N. Smith, R. Berg and L. Muller. *Permafrost. Second International Conference*. . . 1973, 1973, p. 736-45. [Discusses the construction of roads destined for short-term use.]
- SMITH, W. S., and others. Sample disturbance and thaw consolidation of a deep sand permafrost, [by] W. S. Smith and K. Nair [and] R. E. Smith. *Permafrost. Second International Conference*. . . 1973, 1973, p. 392-400. [Effects of sample disturbance may have a significant influence on laboratory test results obtained with permafrost cores recovered from great depth (300-440 m).]
- SOLOVYEV, P. A. Thermokarst phenomena and landforms due to frost heaving in central Yakutia. *Biuletyn Peryglacjalny*, No. 23, 1973, p. 135-55. [Detailed descriptions.]
- SPEER, T. L., and others. Effects of ground-ice variability and resulting thaw settlements on buried warm-oil pipelines, [by] T. L. Speer, G. H. Watson and R. K. Rowley. *Permafrost. Second International Conference*. . . 1973, 1973, p. 746-52. [Describes and discusses field and laboratory tests to determine the type and variability of ground ice occurring in permafrost soils and to establish limiting pipe burial criteria.]
- STEVENS, H. W. Viscoelastic properties of frozen soil under vibratory loads. *Permafrost. Second International Conference*. . . 1973, 1973, p. 400-09. [Presents method of analysis and describes laboratory tests on frozen soils subjected to steady-state sinusoidal vibration in the longitudinal or compression mode and in the torsional or shear mode. Discusses results.]

- SUTHERLAND, H. B., and GASKIN, P. N. Pore water and heaving pressures developed in partially frozen soils. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 409-19. [Compares predicted and actual values of pressures associated with a growing ice lens.]
- TEDROW, J. C. F. Polar soil classification and the periglacial problem. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 285-94. [Reviews present classification and suggests further taxonomic units.]
- THOMSON, S., and LOBACZ, E. F. Shear strength at a thaw interface. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 419-26. [Compares strength characteristics assessed by laboratory tests with those observed in direct shear tests in which a frozen-thawed interface coincided with the shear plane imposed by the direct shear apparatus.]
- TOBIASSON, W. Performance of the Thule hangar soil cooling systems. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 752-58. [Discusses experiences in ducted soil cooling systems gained at Thule airbase, north-west Greenland. Groundwater in the active layer was one particular problem.]
- TSVETKOVA, S. G., ed. *Problemy geokriologii [Problems of geocryology]*. Novosibirsk, Izdatel'stvo "Nauka", 1973. 108 p. [Eleven articles.]
- TUMEL', N. V. Temperature-controlled formation of cryogenic structure of permafrost of the Bol'shezemelskaya Tundra. *Biuletyn Peryglacjalny*, No. 22, 1973, p. 295-313. [Reviews earlier work in this area and presents some new ideas.]
- UGOLINI, F. C., and others. Soil development and patterned ground evolution in Beacon Valley, Antarctica, [by] F. C. Ugolini, J. G. Bockheim, D. M. Anderson. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 246-54. [Detailed study in southern Victoria Land.]
- VIERECK, L. A. Ecological effects of river flooding and forest fires on permafrost in the taiga of Alaska. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 60-67. [Long-lasting effects described.]
- VIEGORIS, L. Über den Blockgletscher des Äusseren Hochebenkars. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 169-88. [Interprets measurements made between 1951 and 1970 on this rock glacier, and discusses its nature and formation.]
- WALKER, H. J. The nature of the seawater-freshwater interface during breakup in the Colville River delta, Alaska. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 473-76. [Position and nature of interface was established with a salinometer and the volume of displaced sea water was calculated for period of break-up flooding. Method usable for any river that ceases flow for period.]
- WATSON, G. H., and others. Performance of a warm-oil pipeline buried in permafrost, [by] G. H. Watson and R. K. Rowley [and] W. A. Slusarchuk. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 759-66. [Observations on settlement when oil was circulated at 71° C.]
- WEIN, R. W., and BLISS, L. C. Biological considerations for construction in the Canadian permafrost region. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 767-70. [Review of problems.]
- WILLIAMS, J. R., and VAN EVERDINGEN, R. O. Groundwater investigations in permafrost regions of North America: a review. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 435-46.
- WILLIAMS, P. J. Use of the ice-water surface tension concept in engineering practice. *Highway Research Record*, No. 393, 1972, p. 19-29. [Discusses prediction of susceptibility of soils to frost heave and prediction of phase composition and, hence, thermal properties of frozen soils, and relates to engineering practice.]
- WOODCOCK, A. H. Permafrost and climatology of a Hawaii volcano crater. *Arctic and Alpine Research*, Vol. 6, No. 1, 1974, p. 49-62. [Describes and discusses occurrence of permafrost extending to 10 m depth at altitude of 4 140 m and mean annual air temperature of 3.6° C.]
- YONG, R. N., and others. Some aspects of surficial salt treatment for attenuation of frost heaving, [by] R. N. Yong, J. C. Osler and P. V. Janiga. *Permafrost. Second International Conference*. . . . 1973, 1973, p. 426-32. [Describes preliminary results obtained from two-year field study that will enable a complete analysis of the salt treatment problem to be made.]

METEOROLOGICAL AND CLIMATOLOGICAL GLACIOLOGY

- BORISENKOV, YE. P., and CHERNUKHIN, M. SH. Estimation of the energy balance elements of the polar zone of the northern hemisphere (north of 50° N). (In Orvig, S., ed. *Energy fluxes over polar surfaces* Geneva, World Meteorological Organization, 1973, p. 219-43.) [Most distinct patterns observed in winter, when intense flow of heat is directed into polar zone from the Pacific. Cold flow from Arctic observed over Eurasia and North America.]
- FLETCHER, J. O., and others. Numerical simulation of the influence of Arctic sea ice on climate, by J. O. Fletcher, Y. Mintz, A. Arakawa and T. Fox. (In Orvig, S., ed. *Energy fluxes over polar surfaces* Geneva, World Meteorological Organization, 1973, p. 181-218.) [Comparison between time-averaged distributions of atmospheric variables in two numerical atmospheric general circulation experiments, one with and one without ice over the Arctic Ocean.]
- HESS, M. A method of determining the influence of mountain glaciers on the climate. *Arctic and Alpine Research*, Vol. 5, No. 3, Pt. 2, 1973, p. A183-A186. [Develops linear equations relating mean monthly temperatures to other temperature-related climatic elements and uses these to demonstrate degree of influence of glaciers on climate. Shows that climate as a whole can be changed if there is a change in the mean monthly temperature.]
- HOBBS, P. V., and FARBER, R. J. Fragmentation of ice particles in clouds. *Journal de Recherches Atmosphériques*, Vol. 6, 1972, p. 246-58. [Evidence for this fragmentation and discussion of possible mechanisms.]
- HOBBS, P. V., and others. Collection of ice particles from aircraft using detectors, [by] P. V. Hobbs, R. J. Farber and R. G. Joppa. *Journal of Applied Meteorology*, Vol. 12, No. 3, 1973, p. 522-28. [Design, evaluation and field testing of two devices which can collect delicate ice crystals from aircraft.]

- HOLMGREN, B. The energy exchange in the superimposed ice zone of the Devon Island ice cap in summer. (*In Orvig, S., ed. Energy fluxes over polar surfaces . . .* Geneva, World Meteorological Organization, 1973, p. 1-23.) [Presents and discusses results of micrometeorological measurements.]
- HUNT, G. E. Radiative properties of terrestrial clouds at visible and infra-red thermal window wavelengths. *Quarterly Journal of the Royal Meteorological Society*, Vol. 99, No. 420, 1973, p. 346-69. [Theory including ice clouds.]
- JAYAWEEERA, K. O. L. F., and OHTAKE, T. Properties of columnar ice crystals precipitating from cloud layers. *Journal of the Atmospheric Sciences*, Vol. 31, No. 1, 1974, p. 280-86. [Crystals collected, photographed, and weighed. Habit similar to laboratory grown crystals. Bundles form by growth of secondary crystals on prism faces.]
- KUHN, M. Spectral energy distribution in shortwave fluxes over the east Antarctic plateau. (*In Orvig, S., ed. Energy fluxes over polar surfaces . . .* Geneva, World Meteorological Organization, 1973, p. 24-47.) [Radiation fluxes in the spectral range below 4μ were used to characterize the scattering and absorbing processes in the Antarctic atmosphere; results are discussed.]
- MANDRIOLI, P., and others. Distribution of microorganisms in hailstones, [by] P. Mandrioli, G. L. Puppi, N. Bagni, F. Prodi. *Nature*, Vol. 246, No. 5433, 1973, p. 416-17. [Number and type of germinating microorganisms and their radial variation in a 7 cm hailstone.]
- MASON, B. J. Production of ice crystals in slightly supercooled cumulus. *Nature*, Vol. 245, No. 5426, 1973, p. 451-53. [Letter. Discussion of theoretical explanation of existence of ice crystals in such clouds in terms of growth of rimed pellets which shed ice splinters.]
- PITTER, R. L. An experimental and numerical investigation of the evolution of ice particles in atmospheric clouds. *Dissertation Abstracts International*, B, Vol. 34, No. 6, 1973, p. 2841-B. [Experiments in cloud tunnel and theoretical calculations of crystal growth. Abstract of Ph.D. thesis, University of California, Los Angeles, 1973. University Microfilms order no. 73-28748.]
- POGOSYAN, KH. P. The effect of large-scale tropospheric processes upon the geopotential field variations and the stratospheric air circulation. (*In Orvig, S., ed. Energy fluxes over polar surfaces . . .* Geneva, World Meteorological Organization, 1973, p. 244-48.) [Shows that stratospheric warmings occur in the northern hemisphere as a result of localized meridional processes originating in the troposphere. These conditions are not available in the southern hemisphere.]
- RADOK, U. On the energetics of surface winds over the Antarctic ice cap. (*In Orvig, S., ed. Energy fluxes over polar surfaces . . .* Geneva, World Meteorological Organization, 1973, p. 69-100.) [Study of katabatic winds and their effect on the heat balance of the Antarctic ice sheet. Compares with trade winds.]
- SCHEMENAUER, R. S. The convective mass-transfer of snow crystals, conical graupel and conical small hail modes. *Dissertation Abstracts International*, B, Vol. 34, No. 8, 1974, p. 3976-B. [Experiments to study mass transfer by diffusion and convection to models of snow, graupel and hail. Abstract of Ph.D. thesis, University of Toronto, 1972.]
- THOMPSON, D. C. Surface heat balance and climate in an ice-free area of Antarctica. (*In Orvig, S., ed. Energy fluxes over polar surfaces . . .* Geneva, World Meteorological Organization, 1973, p. 167-79.) [Presents results from two years' continuous observations in Wright Valley.]
- VINJE, T. E. On wind and temperature profiles above an Antarctic ice shelf. (*In Orvig, S., ed. Energy fluxes over polar surfaces . . .* Geneva, World Meteorological Organization, 1973, p. 101-14.) [Discusses results of measurements of wind speed and temperature made 27 m above surface.]
- VOWINGKEL, E., and ORVIG, S. Synoptic energy budgets from the Beaufort Sea. (*In Orvig, S., ed. Energy fluxes over polar surfaces . . .* Geneva, World Meteorological Organization, 1973, p. 143-66.) [Results of investigation of oasis effect, based on surface and upper air observations from drifting ice station.]
- WENDLER, G. Some measurements of the diurnal variation of the heat balance in central Alaska. (*In Orvig, S., ed. Energy fluxes over polar surfaces . . .* Geneva, World Meteorological Organization, 1973, p. 48-67.) [Explains physical processes in air and soil in relation to their diurnal and seasonal variations.]
- YOUNG, S. B., and SCHOFIELD, E. K. Pollen evidence for late Quaternary climate changes on Kerguelen Islands. *Nature*, Vol. 245, No. 5429, 1973, p. 311-12. [Discusses, in the light of studies on Îles Kerguelen, the suggestion that late-glacial and post-glacial changes in climate and vegetation were synchronous in the northern and southern hemispheres.]

SNOW

- ABDUL-HALIM, R. K. Interaction of water quality, rainfall and snowmelt on soil salinity using sensors and samples. *Dissertation Abstracts International*, B, Vol. 33, No. 6, 1972, p. 2435-B-36-B. [Study of changes in salinity of a 70 cm soil profile for furrow-irrigated *Zea mays* L. under semi-arid climate of 45 cm average annual precipitation for two years. Abstract of Ph.D. thesis, Colorado State University, 1972. University Microfilms order no. 72-31310.]
- AMBACH, W. Probleme des freien Wassergehaltes der Schneedecke. *Sicherheit in den Bergen. Jahrbuch* (Wien), 1972, [pub.] 1973, p. 89-95. [Describes briefly methods for measuring the amount of free water contained in snow cover, and the relation between free water content and avalanche occurrence.]
- AMBACH, W., and DENOTH, A. Studies on the dielectric properties of snow. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 113-23. [Relations are established between dielectric constant, density and free water content of snow samples of various structures.]
- AMBACH, W., and others. Isotopic oxygen composition of firn, old snow and precipitation in alpine regions, by W. Ambach, H. Eisner and K. Pessl. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 125-35. [Results of studies on firn cores, new snow and rain, all collected at different altitudes. Shown that snow layers could be identified within a snow pack by changes in isotopic composition during accumulation and ablation.]

- ARMSTRONG, R. L. Avalanche studies in the San Juan Mountains of southwestern Colorado. *Proceedings of the Western Snow Conference*, 41st annual meeting, 1973, p. 44-51. [Describes activities of the Institute of Arctic and Alpine Research, University of Colorado.]
- [AVALANCHES.] Avalanche classification. *Hydrological Sciences Bulletin*, Vol. 18, No. 4, 1973, p. 391-402. [Proposal of the Working Group on Avalanche Classification of the International Commission on Snow and Ice.]
- BARTOS, L. R., and RECHARD, P. A. Snow sampling technique on a small subalpine watershed. *Proceedings of the Western Snow Conference*, 41st annual meeting, 1973, p. 52-61. [Discusses the advantages of a transect method of snow measurements. Snow density was uniform and required only a few measurements; more depth measurements were required.]
- BOOTH, B. J. A simplified snow predictor. *Meteorological Magazine*, Vol. 102, No. 1216, 1973, p. 332-40. [Effectiveness of dew-point temperature as a snow predictor is reconsidered, and a simplified snow index suggested.]
- COYNE, P. I., and KELLEY, J. J. Variations in carbon dioxide across an Arctic snowpack during spring. *Journal of Geophysical Research*, Vol. 79, No. 6, 1974, p. 799-802. [Subnivean CO₂ was continually higher than ambient CO₂ during period 1 May to 9 June 1971 near Barrow, Alaska. Reasons discussed.]
- CROOK, A. G., and FREEMAN, T. G. A comparison of techniques of sampling the Arctic-subarctic snowpack in Alaska. *Proceedings of the Western Snow Conference*, 41st annual meeting, 1973, p. 62-68. [Compares Bowman and CRREL snow samplers, and shows how data collected by one method may be adjusted to conform to values obtained by the other.]
- ELGMORK, K., and others. Polluted snow in southern Norway during the winters 1968-1971, [by] K. Elgmork, A. Hagen and A. Langeland. *Environmental Pollution*, Vol. 4, No. 1, 1973, p. 41-52. [Study of snow profile shows correlation between greyish colour and acidity.]
- GARY, H. L. Growth of Engelmann spruce (*Picea engelmannii*) unaffected by increased snowpack. *Arctic and Alpine Research*, Vol. 6, No. 1, 1974, p. 29-36. [Observations in New Mexico suggest that weather modification programmes will have little detrimental effect on radial growth of existing forests.]
- GEORGE, T. A., and McANDREW, D. W. Snow load analysis and recreational uses of snow data. *Proceedings of the Western Snow Conference*, 41st annual meeting, 1973, p. 69-74. [Describes work in Nevada and Oregon.]
- HENRIKSEN, A. Quantitative chemical analysis of snow. *Vatten*, Årg. 28, 5, 1972, p. 409-12. [Results used to estimate total yearly fall-out of various substances in southern Norway.]
- HOLROYD, E. W., III. The meso- and microscale structure of Great Lakes snowstorm bands—a synthesis of ground measurements, radar data, and satellite observations. *Dissertation Abstracts International*, B, Vol. 33, No. 6, 1972, p. 2747-B. [Includes detailed study of snow crystals in storms. Abstract of Ph.D. thesis, State University of New York at Albany, 1971. University Microfilms order no. 72-31774.]
- HUMPHREY, J. H. Numerical prediction of snowpack temperatures in the eastside Sierra Nevada using a surface energy balance model. *Dissertation Abstracts International*, B, Vol. 33, No. 12, Pt. 1, 1973, p. 5942-B. [Predicted temperatures were usually within 10% of those observed at representative sites. Abstract of Ph.D. thesis, University of Nevada, Reno, 1972. University Microfilms order no. 73-15293.]
- INOUE, M., and MATSUDA, M. Daisetsu-san Yukikabe sekkei ni okeru shitsuryō shūshi no kenkyū [Mass balance study of the Yukikabe perennial snow patch in the Daisetsu mountains]. *Seppyō*, Vol. 35, No. 4, 1973, p. 180-91. [English summary, p. 190-91.]
- ISHIZAKA, Y. On materials of solid particles contained in snow and rain water: part 2. *Journal of the Meteorological Society of Japan*, Vol. 51, No. 5, 1973, p. 325-36. [Snow from Hokuriku coast of Japan contained loess particles blown from Hwang Ho region, China, across the Sea of Japan.]
- ISYUMOV, N. An approach to the prediction of snow loads. *Dissertation Abstracts International*, B, Vol. 33, No. 2, 1972, p. 704-B. [Describes assessment of snow loads on roofs from the balance between loads added by individual snowfalls and amounts removed by various natural depletion mechanisms. Abstract of Ph.D. thesis, University of Western Ontario, 1971. Microfilm order from National Library of Canada, Ottawa.]
- JUDSON, A., and ERICKSON, B. J. Predicting avalanche intensity from weather data: a statistical analysis. *U.S. Dept. of Agriculture. Forest Service. Research Paper RM-112*, 1973, [ii], 12 p. [Weather and avalanche data from 23 avalanche paths were analysed by univariate techniques, which resulted in a simple two-parameter storm index that effectively predicts the number of avalanches expected on the 23 paths.]
- KIKUCHI, K. On the polarity of the electric charges on snow crystals of the various shapes. *Journal of the Meteorological Society of Japan*, Vol. 51, No. 5, 1973, p. 337-45. [Discusses observations on falling snow crystals made at "Syowa" station, Antarctica, where the electric polarity of dendrite, sector and plate crystals was found to be negative and that of column, bullet and side plane crystals was positive, depending on temperature of growth.]
- MOSER, H., and others. Messungen des Deuterium- und Tritiumgehaltes von Schnee-, Eis- und Schmelzwasserproben des Hintereisferners (Ötztaler Alpen), von H. Moser, W. Rauer, W. Stichler und W. Ambach, H. Eisner. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 8, Ht. 1-2, 1972, p. 275-81. [Relation established between isotope content and altitude of sampling site. Deuterium content significantly higher than in previous year. Results discussed.]
- NOREM, H. *Snøvern*. [Cslø], Yrkesopplæringsrådet for Håndverk og Industri. Universitetsforlaget, 1972. 35 p. [Countermeasures against damage and blocking of roads by avalanches and drifting snow.]
- O'NEILL, A. D. J. The energetics of shallow prairie snowpacks. *Dissertation Abstracts International*, B, Vol. 34, No. 2, 1973, p. 748-B. [Investigation into the development of a snow melt model applicable to the Canadian prairies. Abstract of Ph.D. thesis, University of Saskatchewan, 1973. University Microfilms order no. 73-18664.]
- OWENS, M. S., and WARBURTON, J. A. Analysis of iodine in Antarctic snow. *Antarctic Journal of the United States*, Vol. 8, No. 6, 1973, p. 343-44. [Preliminary data indicate that iodine concentration at inland stations is lower than that previously reported for coastal snow in polar regions.]
- PAYETTE, S., and others. Relations neige-végétation dans la toundra forestière du Nouveau-Québec, Baie d'Hudson,

- [par] S. Payette, L. Filion et J. Ouzilleau. *Naturaliste Canadien*, Vol. 100, No. 5, 1973, p. 493-508. [Herbaceous and cryptogamic formations have denser and more variable depth of snow cover than shrubs and trees. Pattern of snow distribution is discussed in relation to topography and soil conditions in this region.]
- PERLA, R. I., ed. Advances in North American avalanche technology: 1972 symposium. *U.S. Dept. of Agriculture. Forest Service. General Technical Report RM-3*, 1973, [iv], 54 p. [Contains the following papers: W. St. Lawrence and C. Bradley, "Ultrasonic emissions in snow", p. 1-6; C. B. Brown, R. J. Evans and D. McClung, "Incorporation of glide and creep measurements into snow slab mechanics", p. 7-13; J. O. Curtis and F. W. Smith, "Material property and boundary condition effects on stresses in avalanche snowpacks", p. 14-23; T. E. Lang and R. L. Brown, "On the mechanics of the hard slab avalanche", p. 24-28; R. A. Sommerfeld, "Statistical problems in snow mechanics", p. 29-36; M. Mellor, "Controlled release of avalanches by explosives", p. 37-49; P. A. Schaerer, "Observations of avalanche impact pressures", p. 51-54.]
- POULIN, A. O. On the thermal nature and sensing of snow-covered Arctic terrain. *Dissertation Abstracts International*, B, Vol. 33, No. 7, 1973, p. 3067-B-68-B. [Describes winter air imagery experiments showing that sea and lake ice and snow depth, as well as other features, may be identified by means of temperature differences. Abstract of Ph.D. thesis, McGill University, 1972. Microfilm order from National Library of Canada, Ottawa.]
- SANTEFORD, H. S., jr. Management of windblown alpine snows. *Dissertation Abstracts International*, B, Vol. 33, No. 12, Pt. 1, 1973, p. 5943-B. [Run-off from alpine cirques may be augmented successfully by applying a management effort to the wind-blown snow deposits along the ridge line. Abstract of Ph.D. thesis, Colorado State University, 1972. University Microfilms order no. 73-13046.]
- SCHAEFER, D. G., and NIKLEVA, S. N. Mean precipitation and snowfall maps for a mountainous area of potential urban development. *Proceedings of the Western Snow Conference*, 41st annual meeting, 1973, p. 80-89. [Study of climate north and west of Vancouver, Canada. Discusses problems of heavy rain and budgeting for snow removal.]
- SCHOENI, T. R. Picture of the month. Autumn snow storms in the plains. *Monthly Weather Review*, Vol. 101, No. 12, 1973, p. 898-900. [Observations made by satellite over the Great Plains of the United States.]
- SCHULTZ, R. W. Snowmelt lysimeters perform well in cold temperatures in central Colorado. *U.S. Dept. of Agriculture. Forest Service. Research Note RM-247*, 8 p. [Describes and discusses performance of lysimeters.]
- SCHULTZ, R. W. The use of snowmelt lysimeters for estimating the temporal and spatial distribution of snowmelt at Fraser experimental forest, Colorado. *Dissertation Abstracts International*, B, Vol. 33, No. 5, 1972, p. 2182-B. [Abstract of Ph.D. thesis, University of Michigan, 1972. University Microfilms order no. 72-29197.]
- SMITH, A. H. Picture of the month. Snow covers the southland. *Monthly Weather Review*, Vol. 101, No. 8, 1973, p. 654-55. [The NOAA 2 VHRR (visible) data of 10 and 11 February 1973 reveal, in detail, the structure of a major storm with resulting snow cover over the south-eastern United States.]
- SULAHRIA, M. B. Prediction of water retentive capacity of high elevation snowpacks on the east side of the Sierra Nevada. *Dissertation Abstracts International*, B, Vol. 33, No. 12, Pt. 1, 1973, p. 5943-B. [Abstract of Ph.D. thesis, University of Nevada, 1972. University Microfilms order no. 73-12903.]
- TABLER, R. D. Evaporation losses of windblown snow, and the potential for recovery. *Proceedings of the Western Snow Conference*, 41st annual meeting, 1973, p. 75-79. [Demonstrates the size of losses from wind-blown snow by sublimation, and shows how this amount may be estimated. Importance of snow fences stressed.]
- TRUMAN, J. C. Wave propagation in snow. *American Journal of Physics*, Vol. 41, No. 2, 1973, p. 282-83. [Describes swishing sound and occasionally visible receding wave front caused by walking in snow, and discusses conditions of occurrence.]
- VEVERKA, J. The photometric properties of natural snow and of snow-covered planets. *Icarus*, Vol. 20, No. 3, 1973, p. 304-10. [Using the white light measurements of Knowles Middleton and Mungall, the Minnaert constants k and B_0 are derived for six types of snow surfaces for phase angles up to 80° and are used to estimate some parameters of smooth snow-covered planets.]
- WARBURTON, J. A., and others. Silver concentrations in Antarctic snow and firn, [by] J. A. Warburton, G. O. Linkletter and L. G. Young. *Antarctic Journal of the United States*, Vol. 8, No. 6, 1973, p. 342-43. [Average concentration was 8×10^{-13} g silver/ml.]
- WARD, J. C. Water pollution potential of snowfall on spent oil shale residues. *Proceedings of the Western Snow Conference*, 41st annual meeting, 1973, p. 37-43. [Factors in concentration and composition of water pollution from residue are cumulative volume, porosity of residue, soil moisture content, snow melt rate and fraction of snow melt water appearing as run-off. Overland flow water quality model presented.]
- WOO, MING-KO. Numerical simulation of snow hydrology for management purposes. *Dissertation Abstracts International*, B, Vol. 33, No. 8, 1973, p. 3758-B. [Describes method of estimating snow storage and melt water release for small coastal mountain basins in the temperate forest zone of south-western British Columbia. Microfilm order from National Library of Canada, Ottawa.]