Journal of Glaciology, Vol. 17, No. 77, 1976

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

COLLETT, L. C., *and* BROWN, R. J. E., *ed.* Proceedings of a symposium on permafrost geophysics, 27 and 28 February 1974. *Canada. National Research Council. Associate Committee on Geotechnical Research. Technical Memorandum* No. 113, 1974, iii, 105 p. [Includes the following papers and summaries of papers: L. S. Collett, "Geophysical parameters of permafrost", p. 1–16; A. M. Jessop and A. S. Judge, "Temperature and heat flux measurements through permafrost as a geophysical tool", p. 17–27; P. Hoekstra, "Electrical resistivity profile of permafrost", p. 28–34; M. S. King, T. S. Bramford and P. J. Kurfurst, "Ultrasonic velocity measurements on frozen rocks and soils", p. 35–42; C. Tarnocai and J. Thie, "Application of remote sensing to permafrost studies", p. 43–47; W. J. Scott and J. A. M. Hunter, "Seismic and electrical methods in permafrost detection", p. 48–49; M. K. Ghosh and P. G. Hallof, "Geoprobe EMR-14—a new multi-spectral EM induction system for delineating depths of permafrost zones", p. 50–59; V. N. Rampton and R. I. Walcott, "The detection of ground ice by gravity profiling"; p. 60–64; J. A. M. Hunter and G. D. Hobson, "A seismic refraction method to detect sub-sea bottom permafrost", p. 65–66; P. V. Sellmann, J. D. McNeill and W. J. Scott, "Airborne E-phase resistivity surveys of permafrost—central Alaska and Mackenzie River areas", p. 67–71; G. W. Smith and G. Rempel, "Review of problems of exploration geophysics in permafrost", p. 72–79; R. F. Burns and J. M. Hamilton, "Some geophysical and hydrological aspects of permafrost in the Cornwallis Island area, N.W.T.", p. 80–91; W. J. Scott, K. J. Campbell and A. S. Orange, "EM pulse survey method in permafrost", p. 92–96; E. T. Connolly, "Use of wireline well log information to determine presence of permafrost", p. 97–99.]

[INTERNATIONAL INSTITUTE OF REFRIGERATION.] *Progress in refrigeration science and technology. Proceedings of the XIII International Congress of Refrigeration, Washington, D.C., 1971.* Vol. 1. Westport, Conn., AVI Publishing Co., 1973. [Session 9.1, devoted to applications of freezing to separation and freezing in porous media. Includes following papers: H. A. C. Thijssen and J. G. Romijn, "Freeze concentration of food liquids", p. 719–24; J. H. Fraser and W. E. Gibson, "A new look at secondary refrigerant desalination", p. 725–30; W. W. Rinne and S. Johnson, "Desalting of brackish waters by evaporative freezing", p. 731–38; J. B. Farrell, "A status report on the utilization of freezing in dewatering of sludges", p. 739–43; M. Vignes and J. Aguirre-Puente, "Étude de la surfusion de l'eau dans un milieu finement dispersé", p. 745–50; I. Szanto and J. Aguirre-Puente, "Étude des caractéristiques thermiques des mileux poreux fins humides lors de leur congélation", p. 751–57; J. Aguirre-Puente, B. Khatsou and M. Chalhoub, "Étude de gonflement et de l'aspiration d'eau engendre par le gel lors de la congélation des sols fins humides", p. 759–64; C. Stamatescu, "Sur le problème de l'efficacité du processus frigorifique à éjection de vapeur d'eau", p. 765–71.]

RANGO, A., *ed. Operational applications of satellite snowcover observations. The proceedings of a workshop held August 18–20, 1975 at the Waystation, south Lake Tahoe, California.* Washington, D. C., National Aeronautics and Space Administration. Scientific and Technical Information Office. 1975. viii, 430 p. (NASA SP-391.) [Includes the following papers: A. Rango, "An overview of the applications systems verification test on snowcover mapping", p. 1–12; H. H. Schumann, "Operational applications of satellite snowcover observations and LANDSAT data collection systems operations in central Arizona", p. 13–28; W. L. Warskow, T. T. Wilson, Jr. and K. Kirdar, "The application of hydrometeorological data obtained by remote sensing techniques for multipurpose reservoir operations", p. 29–37; A. J. Brown and J. F. Hannaford, "Interpretation of snowcover from satellite imagery for use in water supply forecasts in the Sierra Nevada", p. 39–51; J. N. Washicheck and T. Mikesell, "Operational applications of satellite snowcover observations in Rio Grande drainage of Colorado", p. 53–69; F. A. Limpert, "Operational application of satellite snowcover observations—northwest United States", p. 71–85; S. R. Schneider, "The operational program of satellite snowcover observations at NOAA/NESS", p. 87–101; J. S. Aul and P. F. Ffolliott, "Use of areal snow cover measurements from ERTS-1 imagery in snowmelt-runoff relationships in Arizona", p. 103–12; A. G. Thompson, "Utilization of LANDSAT monitoring capabilities for snowcover depletion analysis", p. 113–27; E. F. Katibah, "Operational use of LANDSAT imagery for the estimation of snow areal extent", p. 129–42; R. D. Seifert, R. F. Carlson and D. L. Kane, "Operational applications of NOAA–VHRR imagery in Alaska", p. 143–55; A. Rango, V. V. Salomonson and J. L. Foster, "Employment of satellite snowcover observations for improving seasonal runoff estimates", p. 157–74; C. F. Leaf, "Applications of satellite snow cover in computerized short-term streamflow forecasting", p. 175–86; L. C. Breaker and M. C. McMillan, "Sierra Nevada snow melt from SMS-2", p. 187–97; J. C. Barnes and M. D. Smallwood, "Synopsis of current satellite snow mapping techniques, with emphasis on the application of near-infrared data", p. 199–213; M. J. Meier and W. E. Evans, "Comparison of different methods for estimating snowcover in forested, mountainous basins using LANDSAT (ERTS) images", p. 215–34; K. I. Itten, "Approaches to digital snow mapping with LANDSAT-1 data", p. 235–47; V. R. Algazi and M. Suk, "An all digital approach to snow areal mapping and snow modeling", p. 249–57; W. C. Dallam and J. Foster, "Digital snow mapping

technique using LANDSAT data and general electric image 100 system", p. 259–78; S. G. Luther, L. A. Bartolucci and R. M. Hoffer, "Snow cover monitoring by machine processing of multitemporal LANDSAT MSS data", p. 279–94; L. A. Bartolucci, R. M. Hoffer and S. G. Luther, "Snowcover mapping by machine processing of SKYLAB and LANDSAT MSS data", p. 295–311; D. F. McGinnis, Jr., "A progress report on estimating snow depth using VHRR data from NOAA environmental satellites", p. 313–24; J. M. Sharp and R. W. Thomas, "A comparison of operational and LANDSAT-aided snow water content estimation systems", p. 325–44; H. W. O'Brien and R. H. Munis, "Red and near-infrared spectral reflectance of snow", p. 345–60; M. C. McMillan and J. L. Smith, "Remote sensing of snowpack density using shortwave radiation", p. 361–73; W. I. Linlor, F. D. Clapp, M. F. Meier and J. L. Smith, "Snow wetness measurements for melt forecasting", p. 375–97; T. C. Chang and P. Gloersen, "Microwave emission from dry and wet snow", p. 399–407; V. C. Bissell, "Application of Bayesian decision theory to airborne gamma snow measurement", p. 409–20; V. V. Salomonson and A. Rango, "Summary of the operational applications of satellite snowcover observations working session—August 20, 1975", p. 421–26.]

WELLER, G., *and* BOWLING, S. A., *ed.* Climate of the Arctic. [*Proceedings of the*] 24th *Alaska Science Conference, Fairbanks, Alaska, August 15 to 17, 1973*, [©1975], [x], 436 p. [Includes the following papers: T. B. Kellogg, "Late Quaternary climatic changes in the Norwegian and Greenland seas", p. 3–36; I. I. Schell, D. A. Corkum and E. N. Sabbagh, "Recent climatic changes in the eastern North American sub-Arctic", p. 76–81; R. G. Barry, R. S. Bradley and J. D. Jacobs, "Synoptic climatological studies of the Baffin Island area", p. 82–90; H. Flohn, "Background of a geophysical model of the initiation of the next glaciation", p. 98–110; W. W. Kellogg, "Climatic feedback mechanism involving the polar regions", p. 111–16; W. R. Schmitt, C. K. Stidd and J. D. Isaacs, "Ice ages and northern forests", p. 117–19; J. Williams and R. G. Barry, "Ice age experiments with the NCAR general circulation model: conditions in the vicinity of the northern continental ice sheets", p. 143–49; E. Ng and P. C. Miller, "A model of the effect of tundra vegetation on soil temperatures", p. 222–26; C. W. Goodwin and S. I. Outcalt, "The development of a computer model of the annual snow–soil thermal regime in Arctic tundra terrain", p. 227–29; W. B. Goddard, "Description of a surface temperature equilibrium energy balance model with application to Arctic pack ice in early spring", p. 230–37; G. Wendler, C. S. Benson, C. B. Fahl, N. Ishikawa, D. C. Trabant and G. Weller, "Glacio-meteorological studies of McCall Glacier", p. 334–38; C. B. Fahl, "Mean sea level pressure patterns relating to glacier activity in Alaska", p. 339–46; D. C. Trabant, W. D. Harrison and C. S. Benson, "Thermal regime of McCall Glacier, Brooks Range, northern Alaska", p. 347–49; W. D. Harrison, L. R. Mayo and D. C. Trabant, "Temperature measurements on Black Rapids Glacier, Alaska", p. 350–52; T. E. Osterkamp, R. E. Gilfilian and C. S. Benson, "Observations of stage, discharge, pH and electrical conductivity during periods of ice formation in a small sub-Arctic stream", p. 353–57; B. Holmgren, C. S. Benson and G. Weller, "A study of the breakup on the Arctic Slope of Alaska by ground, air and satellite observations", p. 358–66; R. F. Carlson and D. L. Kane, "Hydrology of Alaska's Arctic", p. 367–73; E. R. Walker and R. A. Lake, "Runoff in the Canadian Arctic Archipelago", p. 374–78; L. H. Shapiro and J. J. Burns, "Satellite observations of sea ice movement in the Bering Strait region", p. 379–86; D. A. Rothrock, "The steady drift of an incompressible ice cover in the Arctic Ocean", p. 387–90; R. D. Muench, "Some observations of variations in North Water surface area and in certain atmospheric parameters", p. 391–97; P. Gloersen, T. T. Wilheit, T. C. Chang, W. Nordberg and W. J. Campbell, "Microwave maps of the polar ice of the Earth", p. 407–14; E. P. McClain, "Environmental research and applications using the very high resolution radiometer (VHRR) on the NOAA-2 satellite—a pilot project in Alaska", p. 415–29; N. Untersteiner, "Some elements of a scientific plan for POLEX", p. 430–36.]

WILLIAMS, G. P., *comp.* Proceedings: research seminar thermal regime of river ice. 24–25 October 1974. Snow and Ice Subcommittee, Associate Committee on Geotechnical Research. *Canada. National Research Council. Associate Committee on Geotechnical Research. Technical Memorandum* No. 114, 1975, iv, 186 p. [Includes: N. Marcotte, "Heat transfer from open-water surfaces in winter", p. 2–17; T. McFadden, "Radiation and evaporation heat loss during ice fog conditions", p. 18–27; D. M. Gray and D. H. Male, "Energy transfer in snow", p. 28–43; L. E. Goodrich, "A numerical model for calculating temperature profiles in an ice cover", p. 44–59; J. E. Cowley and S. T. Lavender, "Convective heat transfer at an ice–water interface", p. 60–76; G. Tsang, "A preliminary investigation and experimental set-up for the study of frazil formation in water with surface waves", p. 82–95; B. Michel and T. O'D. Hanley, "Mechanisms of ice growth at the ice–water–air interface in a laboratory tank", p. 96–103; T. E. Osterkamp, "Supercooling and frazil ice formation in a small sub-Arctic stream", p. 104–08; K. W. Lathem, "Ice regime investigations on the Moira River at Belleville, Ontario", p. 109–20; C. B. Stalnaker and J. L. Arnette, "Ecological implications of frazil and anchor ice in high mountain streams", p. 121–26; J. R. Robinson and D. F. Witherspoon, "Practical application of probability forecasts of water surface temperatures of St. Lawrence River—Kingston to Montreal", p. 128–33; V. C. Kartha, "Winter temperature measurements in lakes along the Churchill River diversion route", p. 134–44; C. H. Atkinson, "Statistical analysis of Niagara ice boom effects on water temperature", p. 145–51; R. Larivière et F. Fonseca, "Régime thermique des grands reservoirs soumis aux conditions de glace", p. 152–69; H. R. Kivisild and J. Penel, "Ice jams related to climatological and hydraulic parameters—Yukon River at Dawson City", p. 170–76; R. F. Carlson, "Alaska river thermal problems, research and design criteria", p. 177–80.]

WILLIAMS, G. P., *comp.* Seminar on ice jams in Canada held at the University of Alberta, May 7, 1973. Sponsored by Snow and Ice Subcommittee, Associate Committee on Geotecnical [*sic*] Research. *Canada. National Research Council. Associate Committee on Geotechnical Research. Technical Memorandum* No. 107, 1973, iv, 182 p. [Includes the following papers: C. H. Atkinson, "Problems and economic importance of ice jams in Canada", p. 1–16; G. P. Williams and D. K. MacKay, "Characteristics of ice jams", p. 17–35; B. Michel, "Theory and simulation of ice jams at break-up", p. 36–54; S. S. Lazier, "Hydraulic model study of chunk ice storage —Moira River", p. 55–69; C. H. Atkinson, "1968 ice jam St. John River near Hartland, N.B.", p. 70–75;

H. R. Hopper and E. G. Macdonald, "Hydraulic model simulation of ice jamming during diversion of the Nelson River", p. 76–82; J. B. Nuttall, "River modification and channel improvements", p. 83–91; D. M. Foulds, "Ice booms, diversions and ice control structures", p. 92–95; P. R. M. Toomey, "Ice breakers to control ice jams", p. 96–101; A. Bauer, "Explosives for controlling ice jams", p. 102–21; R. S. Pentland, "Ice formation and jamming on the South Saskatchewan River below Lake Diefenbaker", p. 122–51; D. R. Townsend, "Formation of ice jams under surge action", p. 152–54; D. Deugo, "Ice control on Rideau River, Ottawa", p. 155–57; F. Sampson, "The ice regime of the Peace River in the vicinity of Portage Mountain development, prior to and during diversion", p. 158–78.]

General glaciology

Ambach, W. Umweltisotope — ein Hilfsmittel glaziologischer Forschung. *Wetter und Leben*, Jahrg. 27, Ht. 1–2, 1975, p. 115–18. [Summarizes uses of isotopes in glaciological research.]

Cohen, M. Deep ice absorption in a peculiar infrared source. *Astrophysical Journal*, Vol. 203, No. 1, Pt. 1, 1976, p. 169–70. [Absorption of this source near outer edge of the Rosette Nebula appears to be due to spherical ice grains.]

Doronin, A. N. Elektroprovodnost' taloy vody, poluchennoy iz snega i l'da na stantsii Vostok [Electric conductivity of snow melt water and ice melt water studied at Vostok station]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 91, 1975, p. 70–74. [Conductivity and pH of melted ice and snow samples studied to obtain concentration of impurities.]

Gillett, F. C., *and others*. Anisotropy of constituents of interstellar grains, [by] F. C. Gillett, T. W. Jones, K. M. Merrill, W. A. Stein. *Astronomy and Astrophysics*, Vol. 45, No. 1, 1975, p. 77–81. [Ice to silicate ratio is much larger in direction of the BN source in Orion than in that of VI Cyg No. 12. Implications discussed.]

Southard, R. B., *and* MacDonald, W. R. The cartographic and scientific application of ERTS 1 imagery in polar regions. (*In* Bock, P., *and others, ed. COSPAR. Approaches to Earth survey problems through use of space techniques. Proceedings of the symposium held in Constance, F.R.G. 23–25 May 1973. Edited by P. Bock, with the assistance of F. W. G. Baker and S. Ruttenberg*. Berlin, Akademie-Verlag, 1974, p. 373–86.) [Includes land and sea ice. New features and significant changes observed.]

Glaciological instruments and methods

Barton, M. SNOTEL; automated snow surveys. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 6–9. [Describes snow telemetry (SNOTEL) system for automatic measurement of snow water equivalent and other related data.]

Berikashvili, V. Sh., *and* Macheret, Yu. Ya. Opredeleniye moshchnosti l'da i rel'yefa podlednogo lozha gornykh lednikov metodom podbora s pomoshch'yu EVM po dannym gravimetricheskikh izmereniy [Estimate of ice thickness and bedrock topography of mountain glaciers by the adjustment method with the help of computers according to gravimetric methods]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 146–55. [Presents results of studies on surging glaciers in Caucasus and Pamir. English summary, p. 155.]

Bissell, V. C., *and* Burson, Z. G. Deep snow measurements suggested using cosmic radiation. *Water Resources Research*, Vol. 10, No. 6, 1974, p. 1243–44. [Water equivalent of snow cover may be inferred by degree to which it attenuates cosmic radiation. Describes field test.]

Denisov, A. S. Nomogramma dlya opredeleniya razmerov aysbergov [The nomogram for determination of iceberg dimensions]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 91, 1975, p. 101–03.

Dunne, T., *and* Price, A. G. Estimating daily net radiation over a snowpack. *Climatological Bulletin* (Montreal, McGill University), No. 18, 1975, p. 40–48. [Can be estimated reliably for periods of one day from records of global radiation. Data from two sites in sub-Arctic Canada and one in Vermont, U.S.A.]

Ginzburg, B. M., *and others*. Novyy metod nablyudeniy ledovykh yavleniy na rekakh i vodokhranilishchakh [A new method of observation of ice phenomena on rivers and reservoirs]. [By] B. M. Ginzburg, Yu. V. Nalimov, M. B. Ponomarev. *Meteorologiya i Gidrologiya*, 1975, No. 3, p. 114–15. [Airborne radar.]

Gudmandsen, P., *and others*. New equipment for radio-echo sounding, [by] P. Gudmandsen, E. Nilsson, M. Pallisgaard, N. Skou and F. Sondergaard. *Antarctic Journal of the United States*, Vol. 10, No. 5, 1975, p. 234–36. [Describes development and construction of 60 MHz radar, and tests over Antarctic ice sheet.]

Haefner, H., *and others*. Mapping of snow cover in the Swiss Alps from ERTS 1 imagery, [by] H. Haefner, R. Gfeller and K. Seidel. (*In* Bock, P., *and others, ed. COSPAR. Approaches to Earth survey problems through use of space techniques. Proceedings of the symposium held in Constance, F.R.G. 23–25 May 1973. Edited by P. Bock, with the assistance of F. W. G. Baker and S. Ruttenberg*. Berlin, Akademie-Verlag, 1974, p. 351–55.) [Describes development of semi-automated mapping system and discusses accuracy.]

Hunter, J. A., *and* Veillette, J. Borehole density logging in permafrost, Tuktoyaktuk, District of Mackenzie. Project 730006. *Canada. Geological Survey. Paper* 76-1A, Pt. A, 1976, p. 417. [Density logging tool can be used to detect presence of ice-rich zones.]

Jairell, R. L. An improved recording gage for blowing snow. *Water Resources Research*, Vol. 11, No. 5, 1975, p. 674–80. [Consists of wind-oriented snow trap mounted over precipitation gauge.]

Kotyukh, A. A. Interpretatsiya signalov ot lednikov i lednikovykh beregov na skranakh RLS [Interpretation of signals from glaciers and glacial coasts on screens of radiolocation stations]. *Vestnik Leningradskogo Universiteta. Seriya Geologii i Geografii*, No. 24, Vyp. 4, 1974, p. 147–50. [English summary, p. 150.]

Langer, G., *and* Rodgers, J. An experimental study of the detection of ice nuclei on membrane filters and other substrata. *Journal of Applied Meteorology*, Vol. 14, No. 4, 1975, p. 560–70. [Discussion of methods of detecting nuclei.]

LINLOR, W. I., *and others*. Measurement of snowpack wetness, by W. I. Linlor, J. L. Smith, M. F. Meier, F. C. Clapp, D. Angelakos. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 14–20. [Considers three electrical methods.]

LLIBOUTRY, L. A. Le cryocinégraphe peut-il déceler de petit mouvements par saccades des glaciers? *Hydrological Sciences Bulletin*, Vol. 20, No. 3, 1975, p. 365–66. [Most of the jerky movements of glaciers observed with a cryocinegraph can be attributed to friction in the pulley supporting the invar wire.]

NIKOLAYEV, S. G. Raschet ledovitosti finskogo zaliva na vesennyuyu navigatsiyu [Calculation of ice cover of the Gulf of Finland for the spring navigational period]. *Meteorologiya i Gidrologiya*, 1975, No. 5, p. 86–91. [Presents forecasting method. English summary, p. 91.]

OESCHGER, H., *and others*. C^{14} and other isotope studies on natural ice, by H. Oeschger [and 7 others]. (*In* Rafter, T. A., *and* Grant-Taylor, T., *ed. Proceedings of the International Conference on Radiocarbon Dating, 8th, Civic Centre, Wellington, New Zealand, 18–25 October 1972*. Wellington, Royal Society of New Zealand, 1973, Vol. 1, p. D70–D92.) [Methods of extracting ^{14}C, ^{39}Ar and ^{32}Si for dating including *in situ* melting in bore holes.]

PETERSON, N. R., *and* BROWN, A. J. Accuracy of snow measurements. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 1–5. [Study of accuracy of water content measurement enables recommendation of correction factor to be made.]

SINHA, A. K. Determination of ground constants of permafrost terrains by an electromagnetic method. *Canadian Journal of Earth Sciences*, Vol. 13, No. 3, 1976, p. 429–41.

THOMPSON, K., *and others*. Snowmelt lysimeter, by K. Thompson, J. DeVries and J. Amorocho. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 35–40. [Describes instrument and its operation in Sierra Nevada mountains, California.]

VEILLETTE, J., *and* NIXON, F. M. Permafrost coring equipment. Project 730019. *Canada. Geological Survey. Paper* 76-1A, Pt. A, 1976, p. 269. [Mentions briefly drill, hydrocyclone, auger and frozen core containers.]

PHYSICS OF ICE

BARKATT, A., *and* RABANI, J. Kinetics of spur reactions of electrons in ethylene glycol–water glassy ice. A pulse radiolytic study. *Journal of Physical Chemistry*, Vol. 79, No. 24, 1975, p. 2592–97. [Study of reactions of Cd^{2+} ions with electrons in glassy ice produced by cooling ethylene glycol solution gives evidence for mobile electron precursors of trapped electrons.]

BELL, G. M., *and* SALT, D. W. Three-dimensional lattice model for the water/ice system. *Journal of the Chemical Society. Faraday Transactions*, Pt. II, Vol. 72, Pt. 1, 1976, p. 76–86. [Structure model of liquid water elaborated to include long-range order. Model includes structures like ice Ic and a close-packed structure like ice VII.]

BILGRAM, J. H., *and others*. Spin-lattice relaxation in HF and NH_3 doped ice and the outdiffusion of impurities, [by] J. H. Bilgram, J. Roos and H. Gränicher. *Zeitschrift für Physik*, B, Vol. 23, No. 1, 1976, p. 1–9. [Three relaxation processes distinguished: vested vacancies, Schottky defects and vacancies due to shifting HF to an interstitial site. Outdiffusion of HF occurs in concentration steps.]

BONED, C. Évolution des propriétés diélectriques de la glace: essai de représentation à partir de l'existence d'une microstructure. *Journal de Physique*, Tom. 37, No. 2, 1976, p. 165–74. [Theoretical interpretation of time evolution of dielectric properties of ice based on existence of a microstructure and of a solid–solid transformation. English abstract, p. 165.]

BONED, C. Modèle pour l'étude de l'évolution au cours du temps de la conductivité électrique de la glace polycrystalline. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences* (Paris), Sér. B, Tom. 282, No. 5, 1976, p. 125–27. [Interpretation of variation with time of dielectric properties of ice in terms of the surface layers of the individual crystallites within the polycrystal.]

COOPER, W. A. A possible mechanism for contact nucleation. *Journal of the Atmospheric Sciences*, Vol. 31, No. 7, 1974, p. 1832–37. [Mechanism suggested in which ice embryos formed on a nucleus in vapour nucleate supercooled water on contact.]

EDMONDS, D. T., *and* MACKAY, A. L. The pure quadrupole resonance of the deuteron in ice. *Journal of Magnetic Resonance*, Vol. 20, No. 3, 1975, p. 515–19. [Measured at 77 K for both HDO and D_2O. Results give electric field gradient at deuteron.]

FITZGERALD, W. J., *and* O'CONNOR, D. A. Anomalies in the scattering of gamma-rays from single crystals of HF-doped ice-I_h around 100 K. *Zeitschrift für Physik*, B, Vol. 24, No. 1, 1976, p. 1–5. [Mössbauer effect used to distinguish elastic from inelastic scattering of γ rays and to show ratio of these has anomalies from 106 to 125 K that depend on thermal history.]

FREDERKING, R., *and* GOLD, L. W. Experimental study of edge loading of ice plates. *Canadian Geotechnical Journal*, Vol. 12, No. 4, 1975, p. 456–63. [Plates of columnar ice with columns perpendicular to plate loaded by indentors of various widths. Results show indentation depends on indentor width but not ice thickness, unlike field effects of floating ice on structures.]

FUKUTA, N. Comments on "A possible mechanism for contact nucleation". *Journal of the Atmospheric Sciences*, Vol. 32, No. 12, 1975, p. 2371–73. [Comments on paper by W. A. Cooper, ibid., Vol. 31, No. 7, 1974, p. 1832–37 and reply by Cooper, p. 2373–75.]

GERBAUX, M. M. X., *and others*. Absorption de clathrates de glace dans l'infrarouge lointain, [par] M. M. X. Gerbaux, C. Barthel et A. Hadni. *Spectrochimica Acta*, Vol. 31A, No. 12, 1975, p. 1901–03. [Absorption bands observed H_2S or CCl_4 (or $CHCl_3$ or CH_2Cl_2) introduced into ice as clathrate interpreted in terms of motion of introduced molecules.]

GOLD, L. W., *and* TRAETTEBERG, A. Young's modulus of ice and ice engineering problems. (*In* Weaver, D. S., *ed. Proceedings. Second symposium. Applications of Solid Mechanics. Sponsored by C[anadian] S[ociety of] M[echanical] E[ngineers], C[anadian] S[ociety of] C[ivil] E[ngineers], A[merican] S[ociety of] M[echanical] E[ngineers], June 17*

and 18, 1974. Hamilton, Ontario, Faculty of Engineering, McMaster University, [1975], Vol. 1, p. 1–16.) [Time dependence of Young's modulus discussed with respect to the ductile brittle transition and consequent engineering applications.]

GRIFFIN, O. M. An integral method of solution for combined heat and mass transfer problems with phase transformation. (*In Heat transfer 1974. Proceedings of the fifth International Heat Transfer Conference, September 3–September 7, 1974, Keidanrenkaikan Building, Tokyo.* Tokyo, Japan Society of Mechanical Engineers and Society of Chemical Engineers, Japan, 1974, Vol. 1, p. 211–15.) [Method developed for studying melting processes involving the Stefan number. Theory applied to convective melting of ice in sea-water.]

HOUSE, W. V., *jr.* Spin lattice relaxation in ice Ih and some hydrates. *Dissertation Abstracts International*, B, Vol. 36, No. 7, 1976, p. 3456-B. [Spin-lattice relaxation time measured as function of temperature and pressure. Results support hypothesis that mechanism is via interstitial defects. Abstract of Ph.D. thesis, University of Pittsburgh, 1975. University Microfilms order no. 76-355.]

JACCARD, C. Structural information from dielectric properties of ice. (*In* Luck, W. A. P., *ed. Structure of water and aqueous solutions. Proceedings of the international symposium held at Marburg in July 1973.* Weinheim/Bergstr., Verlag Chemie, Physik Verlag, [c1974], p. 409–24.) [Review of deductions made from dielectric measurements on ice concerning the defects responsible.]

KARELSON, M. M., *and* PALM, V. A. Hydrogen bond energy in ice I calculated by the method of the electrostatic interactions between the partial charges. *Reaktsionnaya Sposobnost' Organicheskikh Soyedinenii*, Tom 11, Vyp. 3, 1975, p. 667–77. [Application of this method to calculate potential energy and length of hydrogen bond in ice.]

KISELEVA, O. A., *and others.* Issledovaniye adgezii l'da k poverkhnosti kvartsevykh kapillyarov [Study of the adhesion of ice to the surface of quartz capillaries]. [By] O. A. Kiseleva, S. N. Klad'ko, V. D. Sobolev, N. V. Churayev. *Kolloidnyy Zhurnal*, Tom 37, Vyp. 6, 1975, p. 1220–22. [Letter. Method for studying ice adhesion to surface of 10–15 μm radius quartz capillaries shows sharp decrease at −3.5°C for pure water, −4 to −6°C for concrete pore moisture attributed to formation of liquid-like layer. English summary, p. 1222.]

KITSUNEZAKI, A., *and others.* Properties of plasma produced by a laser pulse from a freely falling deuterium ice-pellet, by A. Kitsunezaki, M. Tanimoto and T. Sekiguchi. *Plasma Physics*, Vol. 17, No. 11, 1975, p. 875–85. [Study of plasma produced.]

KROH, J., *and* PLONKA, A. ESR studies on fundamental processes in radiation chemistry at low temperatures. Part 1. Photobleaching of trapped electrons in 8M NaOH glass at temperatures 67–173 K. *Nukleonika*, Vol. 20, No. 6, 1975, p. 527–39. [Decay of trapped electrons on photobleaching has apparent activation energy which is positive at top end of temperature range but negative at bottom end.]

LEBEDEV, P. D., *and others.* Skorost' kondensatsii vodyanogo para v led v vakuume [Condensation rate of water vapour to ice *in vacuo*]. [By] P. D. Lebedev, D. P. Lebedev, Ye. F. Andreyev. *Zhurnal Fizicheskoy Khimii*, Tom 49, Vyp. 10, 1975, p. 2654–57. [Reviews methods of analysis and experimental results. English translation in *Russian Journal of Physical Chemistry*, Vol. 49, No. 10, 1975, p. 1556–59.]

LEVKOV, L. K. On processes which modify the ice-forming activity of Cu_2S, AgJ and PbJ_2. *Doklady Bolgarskoy Akademii Nauk*, Tom. 28, No. 9, 1975, p. 1203–05. [Effect of washing with water on nucleating ability.]

LEVKOV, L. K., *and* KONSTANTINOV, P. Effect of adsorbed water molecules on ice-forming activity of Pb_2I aerosol. *Doklady Bolgarskoy Akademii Nauk*, Tom. 28, No. 11, 1975, p. 1489–91.

LOCK, G. S. H. The growth and decay of ice. (*In Heat transfer 1974. Proceedings of the fifth International Heat Transfer Conference, September 3–September 7, 1974, Keidanrenkaikan Building, Tokyo.* Tokyo, Japan Society of Mechanical Engineers and Society of Chemical Engineers, Japan, 1974, Vol. 6, p. 12–27.) [Review of the Stefan problem and the problem of analysing growth and decay of ice in air, in water and in earth.]

MAE, S. Perturbations on disc-shaped internal melting figures in ice. *Journal of Crystal Growth*, Vol. 32, No. 1, 1976, p. 137–38. [Wavy perturbations on Tyndall figures observed and measured.]

MASTRANGELO, C. J., *and* OFFEN, H. W. Fluorescence of 9-aminoacridine in water to 30 kbar. *Journal of Solution Chemistry*, Vol. 4, No. 11, 1975, p. 965–67. [Includes observation of change in fluorescent properties on freezing attributed to dye aggregation.]

MAZZEGA, E., *and others.* Volta effect and liquidlike layer at the ice surface, by E. Mazzega, U. del Pennino, A. Loria and S. Mantovani. *Journal of Chemical Physics*, Vol. 64, No. 3, 1976, p. 1028–31. [Measurements on ice–gold and ice–copper contacts give linear temperature dependence below −30°C but logarithmic dependence on $(T - T_m)$ above. Latter attributed to liquid-like layer on ice surface polarized with oxygens outward.]

MONTEFINALE, T., *and others.* Analysis of ice-nucleation thresholds of water-insoluble solids, [by] T. Montefinale, A. C. Montefinale and H. M. Papee. *Journal of Colloid and Interface Science*, Vol. 54, No. 3, 1976, p. 409–14. [Theoretical expression enabling glaciation thresholds to be evaluated is proposed and tested for AgI under bulk-contact nucleation.]

NARTEN, A. H., *and others.* Diffraction pattern and structure of amorphous solid water at 10 and 77°K, [by] A. H. Narten, C. G. Venkatesh and S. A. Rice. *Journal of Chemical Physics*, Vol. 64, No. 3, 1976, p. 1106–21. [X-ray diffraction data show at least two forms of amorphous ice, a lower density form made at 77 K and a higher density form made at 10 K.]

OLSON, J. O., *and* BOWMAN, L. H. Freezing ice cream and making caramel topping. Illustrating principles of thermodynamics. *Journal of Chemical Education*, Vol. 53, No. 1, 1976, p. 49–50. [Discusses method of operation of an ice–salt freezing mixture as an example of thermodynamics.]

O'REILLY, D. E. Oxygen–oxygen pair correlation function for computer-simulated liquid water. *Journal of Chemical Physics*, Vol. 63, No. 12, 1975, p. 5432–33. [Calculations for quasi-lattice models of water based on ice Ic and ice VII.]

PANYUSHKIN, A. V., *and others*. Vliyaniye temperatury i solenosti vody na adgeziyu l'da k konstruktsionnym materialam i pokrytiyam [Effect of temperature and water salinity on ice adhesion to structural materials and coatings]. [By] A. V. Panyushkin, N. A. Sergacheva, Z. I. Shvayshteyn. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 317, 1975, p. 75–79. [Laboratory experiments show sea-water gives ice of lower adhesion, decreasing temperature of ice formation increases adhesion.]

PINES, A., *and others*. New approach to high-resolution proton NMR in solids: deuterium spin decoupling by multiple-quantum transitions, [by] A. Pines, D. J. Ruben and S. Vega and M. Mehring. *Physical Review Letters*, Vol. 36, No. 2, 1976, p. 110–13. [New technique used to resolve proton N.M.R. spectrum in polycrystalline ice and hence deduce chemical shielding tensor elements.]

PRUPPACHER, H. R., *and* PFLAUM, J. C. Some characteristics of ice-nucleation active sites derived from experiments with a ferroelectric substrate. *Journal of Colloid and Interface Science*, Vol. 52, No. 3, 1975, p. 543–52. [Electric "microrelief" of barium titanate is of fundamental importance in determining whether ice nucleates on it.]

REISCHEL, M. T., *and* VALI, G. Freezing nucleation in aqueous electrolytes. *Tellus*, Vol. 27, No. 4, 1975, p. 414–27. [Effect of dissolved salts on ability of nuclei to act.]

ROGGENSACK, W. D. Large scale laboratory direct shear tests on ice. *Canadian Geotechnical Journal*, Vol. 12, No. 2, 1975, p. 169–78. [Tests on lake ice indicate frictional mechanism of failure with linear dependence of shear strength on normal stress.]

ROSS, R. G., *and others*. Thermal conductivity of allotropic modifications of ice, [by] R. G. Ross, P. Andersson, G. Bäckström. *Nature*, Vol. 259, No. 5544, 1976, p. 553–54. [Measurements for ice II, III, V and VI. Ice Ih has thermal conductivity which decreases with pressure unlike other insulators.]

SAINT-GUIRONS, H. Energie d'activation de relaxation des microcristaux de glace dopée. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences* (Paris), Sér. B, Tom. 282, No. 8, 1976, p. 189–92. [Microcrystals of NH_4Cl and KCl doped ice produced by freezing supercooled droplets and the time evolution of Debye relaxation observed.]

STAHL, D., *and* WEINSPRACH, P.-M. Keimbildung in gerührten Suspensionen aus Eiskristallen und wässrigen Salzlösungen. *Chemie Ingenieur Technik*, 47. Jahrg., Nr. 23, 1975, p. 991. [Summary of paper on theory of nucleation of ice in dilute salt solutions and experimental tests. Full manuscript of 12 p. available as photocopy or microfiche MS 304/75.]

STOCKING, J. H., *and* KING, C. J. Secondary nucleation of ice in sugar solutions and fruit juices. *AIChE Journal*, Vol. 22, No. 1, 1976, p. 131–40. [Determination of nucleation rate as function of degree of supercooling.]

VESNA, V. A. Issledovaniye zamorozhennykh vodnykh rastvorov metodom vozmushchennoy gamma–gamma-korrelyatsia [Investigation of frozen aqueous solutions by the method of perturbed gamma–gamma correlations]. (*In* Lebedev, P. P., *and* Podkopayev, Yu. N., *ed. Programma i tezisy dokladov XXV Soveshchaniya po yadernoy spektroskopii i strukture atomnogo yadra*. Leningrad, Izdatel'stvo "Nauka" Leningradskoye Otdeleniye, 1975, p. 469–70.) [Mössbauer effect of ^{154}Ge from β decay of ^{154}Eu used to study phase changes in ice.]

WATANABE, M., *and others*. Vacuum ultraviolet absorption spectra of ice. (*In* Koch, E.-E., *and others, ed. Vacuum ultraviolet radiation physics. Proceedings of the IV International Conference on Vacuum Ultraviolet Radiation Physics, Hamburg, July 22–26, 1974, edited by E.-E. Koch, R. Haensel and C. Kunz*. [Oxford], Pergamon, [Braunschweig], Vieweg, 1974, p. 70–72.) [Measurements of absorption from 8 to 30 eV in amorphous and cubic ice and discussion.]

WHITWORTH, R. W., *and others*. The velocity of dislocations in ice—a theory based on proton disorder, by R. W. Whitworth, J. G. Paren and J. W. Glen. *Philosophical Magazine*, Eighth Ser., Vol. 33, No. 3, 1976, p. 409–26. [Dislocation velocity calculated on basis of two models—kink movement and flexible dislocation. In both cases theoretical velocity is too slow if proton reorientation is assumed to take place at same rate as in dielectric relaxation.]

WONG, P. T. T., *and* WHALLEY, E. Raman spectra of ice VIII. *Journal of Chemical Physics*, Vol. 64, No. 6, 1976, p. 2359–66. [Measurement at *c.* 100 K for H_2O and D_2O ice, 4 000–50 cm^{-1}.]

LAND ICE. GLACIERS. ICE SHELVES

[ANTARCTICA: ICE SHEET.] South Pole ice moves 30 feet/yr. *Eos. Transactions, American Geophysical Union*, Vol. 57, No. 1, 1976, p. 21. [Ice moving 8–9 m/year towards 40° W. according to calculations made by U.S. Geological Survey, based on satellite measurements. Elevation calculated to be 2 860 m.]

BAKOV, YE. K. Chto takoye "kayushchiyesya snega" Severnogo Karasaya? [What are "nieve penitentes" in Severnyy Karasay?]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 106–07. [Suggests these forms are due to dynamics of glacier, shaped later by ablation. Tyan'-Shan', Kirgizskaya S.S.R. English summary, p. 107.]

BARKOV, N. I., *and others*. Rezul'taty izmereniy temperatury v skvazhine do glubiny 782 m na stantsii Vostok [Ice temperature to the depth of 782 m from the drill hole at Vostok station]. [By] N. I. Barkov, R. N. Vostretsov, O. F. Putikov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 257–59. [1970 and 1972 measurements. English summary, p. 259.]

BENTLEY, C. R., *and* KOHNEN, H. Seismic refraction measurements of internal friction in Antarctic ice. *Journal of Geophysical Research*, Vol. 81, No. 8, 1976, p. 1519–26. [Presents results of 1970–71 detailed refraction studies carried out with emphasis on determination of attenuation of *P* waves. Interprets in terms of loss mechanisms in ice.]

BOZHINSKIY, A. N., *and* GRIGORYAN, S. S. Vozmozhnyy mekhanizm podvizhek kholodnykh lednikov [On the probable mechanism of surges of cold glaciers]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 64–68. [English summary, p. 68.]

CRABTREE, R. D. Changes in the Mýrdalsjökull ice cap, south Iceland: possible uses of satellite imagery. *Polar Record*, Vol. 18, No. 112, 1976, p. 73–76. [Results show detailed changes in extent of ice cap since last re-advance, in about 1850, and indicate value of ERTS imagery in this context.]

DOAKE, C. S. M. Thermodynamics of the interaction between ice shelves and the sea. *Polar Record*, Vol. 18, No. 112, 1976, p. 37–41. [Explanation of processes taking place at ice–water surface.]

DOLGUSHIN, L. D., *and others*. Podvizhka lednika Medvezh'yego v 1973 g. i osnovnyye cherty predshestvovavshey yey evolyutsii lednika [The surge of Lednik Medvezhiy in 1973: the basic traits of glacier evolution preceding this surge]. [By] L. D. Dolgushin, G. B. Osipova, V. V. Stulov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 77–86. [Changes in glacier in Tadzhikskaya S.S.R. after surge of 1963 enabled time and scale of 1973 surge to be forecast. English summary, p. 86.]

DUBROVIN, L. I. Materikovyye vody Antarktidy [Continental waters of Antarctica]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 91, 1975, p. 28–31. [Distribution of four types of inland water discussed: under-ice shelf water, intermittent surface streams and lakes, under-ice lakes, and melt water from ice sheet.]

FIELD, W. O., *ed. Mountain glaciers of the northern hemisphere*. Hanover, N. H., U.S. Cold Regions Research and Engineering Laboratory. Technical Information Analysis Center, 1975. 3 vols: vi, 698 p.; vi, 932 p.; x p., 49 maps. [Vol. 1 includes: G. H. Denton, "Glaciers of Scandinavia", p. 11–44; J. H. Mercer, "Glaciers of the Alps", p. 45–140; J. H. Mercer, "Glaciers of the Pyrenees", p. 141–55; B. Kiteme, "Glaciers of the Arctic islands of the Soviet Union", p. 165–83; E. Horvath, "Glaciers of Kol'skiy Poluostrov (Kola peninsula), Ural'skiy Khrebet (Ural mountains), and Poluostrov Taymyr (Taymyr peninsula)", p. 185–97; E. Horvath and W. O. Field, "Glaciers of the Kavkaz (Caucasus)", p. 199–234; E. Horvath, "Glaciers of Pamir-Alay", p. 235–65; E. Horvath, "Glaciers of the Tyan'-Shan' ", p. 267–96; E. Horvath, "Glaciers of Altaysko-Sayanskaya Gornaya Strana", p. 297–310; E. Horvath, "Glaciers of Severo-Vostok S.S.S.R. (northeast Asia)", p. 311–39; E. Horvath, "Glaciers of Turkey, Armenian S.S.R. and Iran", p. 343–59; E. Horvath, "Glaciers of the Hindu Kush", p. 361–70; J. H. Mercer, "Glaciers of the Karakorum", p. 371–409; J. H. Mercer, "Glaciers of the Himalaya", p. 411–47; P. Lehr and E. Horvath, "Glaciers of China", p. 449–75; P. Lehr, "Glaciers of the northern Andes", p. 479–90; P. Lehr, "Glaciers of Mexico", p. 491–506; G. H. Denton, "Glaciers of the American Rocky Mountains", p. 509–42; P. Lehr, "Glaciers of the Sierra Nevada", p. 543–59; G. H. Denton, "Glaciers of the Cascade and Olympic mountains", p. 561–94; P. Lehr, "Other glaciers of conterminous United States", p. 595–600; G. H. Denton, "Glaciers of the Canadian Rocky Mountains", p. 603–53; G. H. Denton, "Glaciers of the interior ranges of British Columbia", p. 655–70; G. H. Denton, "Glaciers of the Coast Mountains (Pacific ranges and Cascade Mountains) and coast ranges of British Columbia", p. 671–87; E. Horvath, "Glaciers of the Yukon and Northwest Territories (excluding the Queen Elizabeth Islands and St. Elias Mountains)", p. 689–98. Vol. 2 includes: W. O. Field, "Glaciers of the Coast Mountains: Boundary Ranges (Alaska, British Columbia, and Yukon Territory)", p. 11–141; W. O. Field and S. G. Collins, "Glaciers of the St. Elias Mountains", p. 143–297; W. O. Field, "Glaciers of the Chugach Mountains", p. 299–492; W. O. Field, "Glaciers of the Kenai Mountains, Alaska", p. 493–541; S. G. Collins, "Glaciers of the Talkeetna Mountains, Alaska", p. 543–48; G. H. Denton and W. O. Field, "Glaciers of the Wrangell Mountains", p. 549–71; G. H. Denton and W. O. Field, "Glaciers of the Alaska Range", p. 573–620; G. H. Denton and W. O. Field, "Glaciers of the Aleutian Range and Kodiak Island", p. 621–39; G. H. Denton, "Glaciers of the Aleutian Islands", p. 641–50; G. H. Denton, "Glaciers of the Brooks Range", p. 651–62; S. G. Collins, "Glaciers of the Kilbuck and Tikchik mountains", p. 663–70; C. Fahn, "Glaciers of northern Labrador", p. 673–82; J. H. Mercer, "Glaciers of Baffin and Bylot islands", p. 683–721; J. H. Mercer, "Glaciers of the Queen Elizabeth Islands, N.W.T., Canada", p. 723–52; J. H. Mercer, "Glaciers of Greenland", p. 755–808; G. H. Denton, "Glaciers of Jan Mayen", p. 809–27; G. H. Denton, "Glaciers of Iceland", p. 829–77; E. Horvath and C. Fahn, "Glaciers of Svalbard", p. 879–932. Available from U.S. Dept. of Commerce. National Technical Information Service, Springfield, Virginia 22161.]

FOURNO, J.-P. Détermination de l'épaisseur du glacier de Gebroulaz par prospection sismique. *Travaux Scientifiques du Parc National de la Vanoise*, [Vol.] 5, 1974, p. 9–40. [Glacier thickness determined: 90 to 110 m. Presents map showing bedrock contour lines.]

GLAZYRIN, G. YE., *and* MOSHKIN, A. T. Vozmozhnost' vyyavleniya pryamoy svyazi mezhdu kratkovremennymi izmeneniyami klimata i polozheniyem kontsov lednikov [The possibility of establishing direct connections between short-term climatic changes and position of glacier tongue]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 260–64. [English summary, p. 264.]

GOW, A. J., *and* WILLIAMSON, T. Gas inclusions in the Antarctic ice sheet and their glaciological significance. *Journal of Geophysical Research*, Vol. 80, No. 36, 1975, p. 5101–08. [Physical properties of trapped air bubbles in cores obtained to bottom of ice sheet were analysed. Size, shape, abundance and spatial distribution of bubbles, gas volumes, and bubble pressures and variations with depth were measured. Results interpreted.]

GRIFFEY, N. J. An evaluation of the description of the Okstindan glaciers, Nordland, north Norway in the '*Glacier atlas of northern Scandinavia*'. *Norsk Geografisk Tidsskrift*, Bd. 30, Ht. 1, 1976, p. 26–30. [Points out some discrepancies in atlas.]

HALLET, B. Nature and effects of chemical processes at the base of temperate glaciers. *Dissertation Abstracts International*, B, Vol. 36, No. 2, 1975, p. 618-B–19-B. [Carbonate coatings on calcareous outcrops recently deglacierized observed and effect on bed slip discussed. Abstract of Ph.D. thesis, University of California, Los Angeles, 1975. University Microfilms order no. 75-16783.]

HOINKES, H. C., *and* STEINACKER, R. Zur Parametrisierung der Beziehing Klima-Gletscher. *Rivista Italiana di Geofisica e Scienze Affini*, Vol. 1 (Speciale), 1975, p. 97–104. [Using mass balance measurements from Hintereisferner from 1952–53 to 1972–73 and simultaneous observations from climatological station Vent. English summary, p. 103–04.]

HOLDSWORTH, G. *Deformation and flow of Barnes Ice Cap, Baffin Island.* Ottawa, Environment Canada. Inland Waters Directorate. Water Resources Branch, 1975. vii, 19 p. (Scientific Series, No. 52.) [Measurements, 1970 and 1971, have enabled surface velocities and strain-rates to be computed along surface "flow lines" generated from velocity distribution.]

KAMINUMA, K., *and* TAKAHASI, M. Iceshock swarms observed at Mizuho camp, Antarctica. *Nankyoku Shiryō: Antarctic Record*, [No.] 54, 1975, p. 75–83. [Seismological observations on movements of ice, which occurred at night when air temperature was below −35°C and falling.]

KHODAKOV, V. G. Izmereniye, raschet i prognoz degradatsii novoobrazovannogo yazyka lednika Kolka [The measurements, calculation and forecast of degradation of the newly-formed tongue of Lednik Kolka]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 125–36. [Discusses difficulty of measuring and calculating ablation of debris-covered glaciers such as this in Caucasus. English summary, p. 135–36.]

KHODAKOV, V. G. Osobennosti formirovaniya balansa l'da pul'siruyushchego lednika Kolka [The peculiarities of mass-balance formation of the surging Lednik Kolka]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 116–25. [Discusses non-steady mass balance of this glacier in Caucasus. English summary, p. 125.]

KORYAKIN, V. S. O podvizhkakh lednikov v Arktike [On glacier surges in the Arctic]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 140–45. [Describes glacier fluctuations, or surges, on Svalbard, Jan Mayen and Novaya Zemlya. English summary, p. 145.]

KOTLYAKOV, V. M. Vertolety nad lednikami [Helicopters above glaciers]. *Chelovek i Stikhiya* (Leningrad), Vyp. 11, 1973, p. 104–05. [Observations of glaciers in Pamir, Tadzhikskaya S.S.R.]

KOTLYAKOV, V. M., *and others*. Novaya karta pitaniya lednikovogo pokrova Antarktidy [New map of the accumulation on the Antarctic ice sheet]. [By] V. M. Kotlyakov, N. I. Barkov, I. A. Loseva, V. N. Petrov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 248–55. [Presents map based on new data. Represents up-dating of map in *Atlas Antarktiki* (1966). English summary, p. 259.]

KRENKE, A. N. Sushchestvuyushchiye predstavleniya o bystrykh podvizhkakh lednikov [On existing ideas of glacier surges]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 274–89. [Review. English summary, p. 289.]

KRENKE, A. N., *and* POPOVA, V. S. Rekonstruktsiya izmeneniy balansa massy lednikov Kazbeka po meteorologicheskim dannym [Reconstruction of mass balance changes of Kazbek glaciers from meteorological data]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 264–73. [Discusses recent fluctuations in Caucasus. English summary, p. 272–73.]

LUTSENKO, E. I., *and* TIMOKHOV, L. A. Nekotoryye osobennosti antarkticheskogo ledyanogo pokrova v sravnenii s arkticheskom [Some features of the Antarctic ice sheet in comparison with the Arctic.] *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 91, 1975, p. 16–19. [Discusses changes in ice conditions and occurrence of polynyas, 1966–72.]

MCSAVENEY, M. J. The Sherman Glacier rock avalanche of 1964: its emplacement and subsequent effects on the glacier beneath it. *Dissertation Abstracts International*, B, Vol. 36, No. 6, 1975, p. 2674-B–75-B. [Mechanism of the rock-fall and its effect on glacier balance, glacier flow and eventual advance of glacier. Abstract of Ph.D. thesis, Ohio State University, 1975. University Microfilms order no. 75-26624.]

MAHAFFY, M. W. A three-dimensional numerical model of ice sheets: tests on the Barnes Ice Cap, Northwest Territories. *Journal of Geophysical Research*, Vol. 81, No. 6, 1976, p. 1059–66. [Model developed to study areal distribution of mass in ice sheet not necessarily in steady state and applied to Barnes Ice Cap. Results compared well with field evidence.]

MAKAREVICH, K. G., *and* FEDULOV, I. YA. Pul'satsii lednika Shokal'skogo v Zailiyskom Alatay [Fluctuations of Lednik Shokal'skiy in Zailiyskiy Alatau]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 96–101. [Describes and discusses movements of different parts of glacier since 1962. Surge expected within next three years. Kazakhskaya S.S.R. English summary, p. 101.]

MARKIN, V. A. Bol'shiye snega Kamchatki [The great snows of Kamchatka]. *Chelovek i Stikhiya* (Leningrad), Vyp. 11, 1973, p. 106–07. [Discusses relationship between glacier regime and meteorological conditions in Kamchatka.]

MARSHALL, P. Ice-blocked tubes in the Aiyansh flow, British Columbia. *Arctic and Alpine Research*, Vol. 7, No. 4, 1975, p. 399–400. [Presents observations and comments on massive ice deposits blocking lava tubes in cinder cone area.]

MILLER, M. M., *and others*. *Mountain and glacier terrain study and related investigations in the Juneau Icefield region, Alaska–Canada, by M. M. Miller and research affiliates of the Juneau Icefield research program.* Seattle, Washington, Foundation for Glacier and Environmental Research, 1975. [xvi], [326] p. (Monograph Series.) [Final report of programme, presenting results of investigations in 1971–73.]

OSMONOV, A. Nekotoryye svedeniya o pul'siruyushchikh lednikakh Tsentral'nogo Tyan'-Shanya [Some data on the surging glaciers of the central Tyan'-Shan']. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 102–05. [Data presented on recent surges. Kirgizskaya S.S.R. English summary, p. 105.]

PARKER, G. Meandering of supraglacial melt streams. *Water Resources Research*, Vol. 11, No. 4, 1975, p. 551–52. [Shows that differential melting or freezing is necessary, differential change of state is driven by frictional heat, flow must be supercritical for meandering, and meander pattern does not migrate downstream.]

RATSEK, V. I. Ob odnoy iz vozmozhnykh prichin lednikovykh podvizhek [On one of the probable reasons of glacier surges]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 107–09. [Suggests surges caused by permanent retreat of glacier tongue, upsetting balance of system. English summary, p. 109.]

RAYMOND, C. F. Numerical calculation of ice deformation. *Antarctic Journal of the United States*, Vol. 10, No. 5, 1975, p. 238. [Note on development of computer programmes using finite element method. Flow may be rectilinear or planar.]

REVYAKIN, V. S. O vozmozhnykh pul'satsiyakh lednikov Belukhi [On possible pulsations of the Belukhi glaciers]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 136. [Altay, Altayskiy Kray.]

REYNAUD, L. Mouvements du glacier en surface sur une courte échelle de temps. *Hydrological Sciences Bulletin*, Vol. 20, No. 3, 1975, p. 329–39. [Surface velocities measured at three sites on Mer de Glace by two methods for time intervals from 1 to 12 h. during day- and night-time. Jerky motion attributable to errors due to lateral atmospheric refraction.]

ROTOTAYEV, K. P. Lednik Kolka—fakty i vyvody [Lednik Kolka—facts and inferences]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 109–16. [Describes and discusses recent surge (1969) of glacier in Caucasus. English summary, p. 116.]

ROTOTAYEV, K. P. Nastupaniye lednika Didal' na Pamire [Advance of Lednik Didal' in the Pamir]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 188–89. [Tadzhikskaya S.S.R.]

SHUMSKIY, P. A. Mekhanizm skol'zheniya i relaksatsionnyye avtokolebaniya lednikov [The sliding mechanism and relaxation autovariations of glaciers]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 59–64. [Deals with causes of variations in sliding velocity of glaciers. English summary, p. 64.]

SØNDERGAARD, F. *Radioglaciology. Surface soundings near DYE-3*. Lyngby, Technical University of Denmark, Electromagnetics Institute, 1975. (D 258.) 28 leaves. [Bottom profiles, surface–bedrock profile comparison, bedrock contour map and cross polarization measurements, at DYE-3 station (65° 11′ N., 43° 50′ W.), Greenland ice sheet, May and June 1974.]

SUSLOV, V. F. Neugomonnyy lednik [The irrepressible glacier]. *Chelovek i Stikhiya* (Leningrad), Vyp. 13, 1975 (pub. 1974), p. 70–71. [Movement of Lednik Medvezhiy, Tadzhikskaya S.S.R., measured in 1963 and 1973.]

SUSLOV, V. F. O podvizhke i obralakh lednika Didal' v 1974 g. [On the advance and block falls of Lednik Didal' in 1974]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 189–91. [Tadzhikskaya S.S.R.]

TANASIYCHUK, V. N. K ledyanym dvortsam Pinezh'ya [To the ice palaces of Pinezh'ye]. *Chelovek i Stikhiya* (Leningrad), Vyp. 11, 1973, p. 184–87. [Describes caves with ice stalactites and stalagmites in Murmanskaya Oblast', found in 1967.]

THOMAS, R. H. Thickening of the Ross Ice Shelf and equilibrium state of the west Antarctic ice sheet. *Nature*, Vol. 259, No. 5540, 1976, p. 180–83. [Suggests cause of high rate of thickening of ice shelf and reconciles with thinning of west Antarctic ice sheet.]

VINOGRADOV, V. N. Podvizhki lednikov na Klyuchevskoy gruppe vulkanov (Kamchatka) [Glacier surges in the Klyuchevskaya group of volcanoes (Kamchatka)]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 137–40. [Describes surges of several glaciers in this group. English summary, p. 140.]

VINOGRADOV, V. N. Sovremennoye oledeneniye rayonov aktivnogo vulkanizma [Modern glaciation of regions of active volcanism]. *Rezul'taty Issledovaniy po Mezhdunarodnym Geofizicheskim Proyektam* [unnumbered series], 1975, 103 p. [Deals with glaciers and snow cover of Kamchatka, and influence of volcanoes on them.]

VOYTKOVSKIY, K. F. O mekhanizme podvizhki lednika Medvezh'yego [On the mechanisms of the surge of Lednik Medvezhiy]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 68–77. [Longitudinal stress and slip resistance calculated on basis of long-term surveys of glacier in Tadzhikskaya S.S.R. English summary, p. 76–77.]

WEAVER, C. S., *and* MALONE, S. D. Mt. Saint Helens seismic events: volcanic earthquakes or glacial noises? *Geophysical Research Letters*, Vol. 3, No. 3, 1976, p. 197–200. [Recorded low frequency activity may be due to glaciers on Mt Saint Helens, Cascade Range, Washington, U.S.A., not to seismic events.]

WEERTMAN, J. Glaciology's grand unsolved problem. *Nature*, Vol. 260, No. 5549, 1976, p. 284–86. [Discusses whether west Antarctic ice sheet is growing, retreating, or possibly surging.]

WHILLANS, I. M. Mass-balance and ice flow along the Byrd station strain network, Antarctica. *Dissertation Abstracts International*, B, Vol. 36, No. 3, 1975, p. 1108-B–09-B. [Measurements and discussion of reasons for variations and dynamics of undulations. Abstract of Ph.D. thesis, Ohio State University, 1975. University Microfilms order no. 75-19501.]

YABLOKOV, A. A. Ledyanoy potok [An ice flow]. *Meteorologiya i Gidrologiya*, 1975, No. 7, p. 106–07. [Describes unusual movement of Lednik Didal', Tadzhikskaya S.S.R., in 1974.]

YABLOKOV, A. A. Na Skogache [On Skogach]. *Chelovek i Stikhiya* (Leningrad), Vyp. 11, 1973, p. 179–80. [Account of visit to Lednik Skogach, Tadzhikskaya S.S.R., in 1971.]

YEMEL'YANOV, YU. N., *and others*. Dinamika lednika Abramova v period podvizhki 1972–1973 gg. [The dynamics of Lednik Abramov during the surge of 1972–73]. [By] Yu. N. Yemel'yanov, V. K. Nozdryukhin, V. F. Suslov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 87–96. [Describes surge and discusses changes in glacier before it took place. Kirgizskaya S.S.R. English summary, p. 95–96.]

ZAKHAROV, V. F. Sokhranitsya ili ischeznet polyarnaya ledyanaya shapka? [Will the polar ice cap remain or disappear?]. *Chelovek i Stikhiya* (Leningrad), Vyp. 13, 1975 (pub. 1974), p. 22.

ICEBERGS, SEA, RIVER AND LAKE ICE

ALESTALO, J., *and* HÄIKIÖ, J. Ice features and ice-thrust shore forms at Luodonselkä, Gulf of Bothnia, in winter 1972/73. *Fennia*, 144, 1976, 24 p. [Describes rafting and hummocking, and action of ice in shaping shores.]

Buzuyev, A. Ya. Dreyf v rayone polyusa nedostupnosti [Drifting near the Pole of Inaccessibility]. *Chelovek i Stikhiya* (Leningrad), Vyp. 11, 1973, p. 138–40. [Entries from diary written on ice drifting station SP-12 in Arctic Ocean in 1970–71.]

Campbell, W. J., *and others*. Beaufort Sea ice zones as delineated by microwave imagery, [by] W. J. Campbell, P. Gloersen, W. J. Webster and T. T. Wilheit, R. O. Ramseier. *Journal of Geophysical Research*, Vol. 81, No. 6, 1976, p. 1103–10. [Detailed analysis of data obtained in April 1972 from aircraft over shoreline of Harrison Bay northward to 81° showed sea ice could be divided into five distinct zones on basis of different microwave signatures. Discusses properties of each in detail.]

Campbell, W. J., *and others*. Dynamics and morphology of Beaufort Sea ice determined from satellites, aircraft, and drifting stations, [by] W. J. Campbell, P. Gloersen, W. Nordberg and T. T. Wilheit. (*In* Bock, P., *and others, ed. COSPAR. Approaches to Earth survey problems through use of space techniques. Proceedings of the symposium held in Constance, F.R.G. 23–25 May 1973. Edited by P. Bock, with the assistance of F. W. G. Baker and S. Ruttenberg.* Berlin, Akademie-Verlag, 1974, p. 311–27.) [Discusses implications of results from combined analysis of data which shows that eastern Beaufort Sea ice cover is made up of large multi-year floes while western part is of small predominantly first-year floes.]

Flohn, H. Polar albedo changes and their climatic consequences. (*In* Bock, P., *and others, ed. COSPAR. Approaches to Earth survey problems through use of space techniques. Proceedings of the symposium held in Constance, F.R.G. 23–25 May 1973. Edited by P. Bock, with the assistance of F. W. G. Baker and S. Ruttenberg.* Berlin, Akademie-Verlag, 1974, p. 165–67.) [Deals with global or hemispheric temperature variations and their correlation with variations of sea ice in Arctic and Antarctic.]

Gerson, D. J., *and* Rosenfeld, A. Automatic sea ice detection in satellite pictures. *Remote Sensing of Environment*, Vol. 4, No. 3, 1975, p. 187–98. [Describes use of statistical features to discriminate sea ice from clouds with 90% or greater accuracy.]

Gorbunov, Yu. A., *and* Losev, S. M. Ob issledovanii razryvov v sploshnom ledyanom pokrove po materialam radiolokatsionnykh s"yemok [On the study of fractures in continuous ice cover by radio-echo soundings]. *Problemy Arktiki i Antarktiki*, Vyp. 46, 1975, p. 29–33. [Studies of ice of Arctic Ocean.]

International Commission for the Northwest Atlantic Fisheries. *Special session on ice*. Dartmouth, Nova Scotia, International Commission for the Northwest Atlantic Fisheries, 1976. 51 p. (Special Publication No. 9.) [Papers from meeting held in Copenhagen on 1 June 1973: H. H. Valeur, "Polar ice variations off the Greenland west coast 1900–1972", p. 7–27; W. E. Markham, "Variability of ice seasons on the eastern Canadian seaboard", p. 29–40; W. I. Wittmann, "Notes on the time–space variations in the features and dynamics of the east Greenland pack ice", p. 41–45; M. Akagawa, "Outline of present sea ice services in Japan", p. 47–51.]

Kovacs, A., *and others*. Islands of grounded ice, [by] A. Kovacs, H. L. McKim, C. J. Merry. *Arctic*, Vol. 28, No. 3, 1975, p. 213–16. [Presents ERTS-1 observations of growth and decay of two grounded ice islands north of Point Barrow in the Arctic Ocean.]

Kozitskiy, I. Ye. O nekotorykh osobennostyakh vliyaniya morfometrii rusla reki na protsessy vskrytiya i zatoro-obrazovaniya [Some features of the influence of river-bed morphometry on processes of ice break-up and ice jam formation]. *Meteorologiya i Gidrologiya*, 1975, No. 6, p. 74–79. [Observations of ice jams on Dnestr and Pechora rivers. English summary, p. 79.]

Kupetskiy, V. N. Udivitel'nyye linii [Amazing lines]. *Chelovek i Stikhiya* (Leningrad), Vyp. 11, 1973, p. 140–41. [Polygonal cracks on Arctic sea ice.]

Liser, I. Ya. O zazhornom i bezzazhornom kharaktere zamerzaniya rek [On river freezing with or without ice jam formation]. *Meteorologiya i Gidrologiya*, 1975, No. 4, p. 77–83. [Discusses factors determining type of freezing and method for calculating current velocity in front of freeze-up. English summary, p. 83.]

McCann, S. B., *and* Taylor, R. B. Beach freezeup sequence at Radstock Bay, Devon Island, Arctic Canada. *Arctic and Alpine Research*, Vol. 7, No. 4, 1975, p. 379–86. [Observations on sequence of events, August to October 1971.]

McClain, E. P. Earth satellite measurements as applied to sea ice problems. (*In* Bock, P., *and others, ed. COSPAR. Approaches to Earth survey problems through use of space techniques. Proceedings of the symposium held in Constance, F.R.G. 23–25 May 1973. Edited by P. Bock, with the assistance of F. W. G. Baker and S. Ruttenberg.* Berlin, Akademie-Verlag, 1974, p. 149–63.) [Summarizes recent work in Arctic and Antarctic.]

MacKay, D. K., *and* Mackay, J. R. Heat energy of the Mackenzie River, N.W.T. *Canada. Task Force on Northern Oil Development. Environmental-Social Committee, Northern Pipelines. Report* No. 74-35, 1974, p. 1–23. [Deals with influence of heat transport on related physical and biological environments, especially on break-up of lakes and areas around delta perimeter, and on off-shore permafrost in Beaufort Sea.]

McPhee, M. G. An experimental investigation of the boundary layer under pack ice. *Dissertation Abstracts International*, B, Vol. 36, No. 6, 1975, p. 2680-B. [Measurements of mean and turbulent flow structure during 1972 AIDJEX Pilot Study compared with those in atmosphere. Abstract of Ph.D. thesis, University of Washington, 1974. University Microfilms order no. 75-28400.]

Maul, G. A. Applications of ERTS data to oceanography and the marine environment. (*In* Bock, P., *and others, ed. COSPAR. Approaches to Earth survey problems through use of space techniques. Proceedings of the symposium held in Constance, F.R.G. 23–25 May 1973. Edited by P. Bock, with the assistance of F. W. G. Baker and S. Ruttenberg.* Berlin, Akademie-Verlag, 1974, p. 335–47.) [Includes sea ice.]

Mollard, J. D., *and* Carr, P. A. Applications of the ERTS 1 satellite in remote sensing of water resource data in Canada. (*In* Bock P., *and others, ed. COSPAR. Approaches to Earth survey problems through use of space techniques. Proceedings of the symposium held in Constance, F.R.G. 23–25 May 1973. Edited by P. Bock, with the assistance of F. W. G. Baker and S. Ruttenberg.* Berlin, Akademie-Verlag, 1974, p. 189–222.) [Reviews range of applications, including permafrost hydrology problems, effect of snowfall and melting on spring run-off, and tracking of sea ice break-up and movement.]

MOODIE, D. W., *and* CATCHPOLE, A. J. W. Environmental data from historical documents by content analysis: freeze-up and break-up of estuaries on Hudson Bay 1714–1871. *Manitoba Geographical Studies* (Winnipeg, University of Manitoba), 5, 1975, xviii, 119 p.

OSTERKAMP, T. E., *and* GILFILIAN, R. E. Nucleation characteristics of stream water and frazil ice nucleation. *Water Resources Research*, Vol. 11, No. 6, 1975, p. 926–28. [Laboratory and field experiments suggest that since supercooling necessary for spontaneous heterogeneous nucleation of ice in thin surface layer of stream water would be about -4°C, frazil ice cannot be nucleated spontaneously in surface layer of water since temperature would be too high.]

OSTERKAMP, T. E., *and others*. Observations of stage, discharge, *p*H, and electrical conductivity during periods of ice formation in a small subarctic stream, [by] T. E. Osterkamp, R. E. Gilfilian and C. S. Benson. *Water Resources Research*, Vol. 11, No. 2, 1975, p. 268–72. [Ice formation modified stage, velocity profiles, discharge and electrical conductivity, while pH remained nearly constant. Notes effect of frazil and anchor ice.]

OVERTON, A. Ice reconnaissance in the Beaufort Sea. Project 750029. *Canada. Geological Survey. Paper* 76-1A, Pt. A, 1976, p. 419. [ERTS imagery and helicopter reconnaissance show ice instability in shear zone of sea precludes use of seismic methods to define geology.]

PAQUETTE, R. G., *and* BOURKE, R. H. The oceanography of the marginal sea-ice zone. *Naval Research Reviews*, Vol. 29, No. 2, 1976, p. 29–30. [Describes effect of melting of ice on vertical temperature profile and hence on acoustics of this zone.]

PARASHAR, S. K. Investigation of radar discrimination of sea ice. *Dissertation Abstracts International*, B, Vol. 36, No. 2, 1975, p. 854-B. [Study of ability of radar to discriminate sea ice types. Theory of scattering of radar by sea ice developed. Abstract of Ph.D. thesis, University of Kansas, 1974. University Microfilms order no. 75-17655.]

RUFFMAN, A. Of bergy bits and growlers. *Science*, Vol. 192, No. 4234, 1976, p. 7. [Letter. Points out danger of severe damage to ships by pieces of floating ice smaller than icebergs.]

SAVCHENKO, V. G., *and* CHEPURINA, M. A. Neistoychivost' vnutrennykh voln v pokrytom l'dom more [Instability of internal waves in an ice-covered sea]. *Problemy Arktiki i Antarktiki*, Vyp. 46, 1975, p. 67–73. [Research in the Arctic basin.]

SCHWERDTFEGER, W. Relationship of temperature variations and ice conditions in the Atlantic sector of the Antarctic. *Antarctic Journal of the United States*, Vol. 10, No. 5, 1975, p. 237–38. [Study based on continuous records of ice observations from Orcadas station, Scotia Bay, Laurie Island, South Orkney Islands, Antarctica.]

SERIKOV, M. I. Gruzopod"yemnost' l'da i opredeleniye usuliy, razrushayushchikh ledyanoy pokrov [Load-carrying capacity of ice and determination of its breaking strength]. *Problemy Arktiki i Antarktiki*, Vyp. 46, 1975, p. 128–30. [Floating ice.]

SMIRNOV, V. I. Vliyaniye fiziko-mekhanicheskikh svoystv i neravnomernosti tolshchin l'da na dvizheniye sudov v osennezimniy period [Influence of physical and mechanical properties and irregular thickness of ice on the movement of ships in autumn and winter]. *Problemy Arktiki i Antarktiki*, Vyp. 46, 1975, p. 91–95. [Observations in Chaunskaya Guba and Sakhalinskiy Zaliv.]

SOBEY, E. The seasonal growth of ice in the Antarctic. *Journal of the Oceanographical Society of Japan*, Vol. 31, No. 6, 1975, p. 235–41. [Satellite observations of pack ice, February 1973 to June 1974.]

VANCE, G. P. A modeling system for vessels in ice. *Dissertation Abstracts International*, B, Vol. 36, No. 2, 1975, p. 860-B. [Technique of scaling results obtained from model tests and design of a test facility to conduct model icebreaking tests. Abstract of Ph.D. thesis, University of Rhode Island, 1974. University Microfilms order no. 75-13704.]

VAUDREY, K. D. *Ice engineering: elastic property studies on compressive and flexural sea ice specimens*. Port Hueneme, California, Naval Construction Battalion Center, 1975. 15 p. (Technical Note N-1417.) [Laboratory and field tests performed to determine compressive strength, flexural strength, and modulus of elasticity. Tested at four temperatures; flexural specimens included two crystal orientations.]

VOLKOV, N. A. Ledovym prognozam pyat'desyat let [Fifty years of ice forecasting]. *Chelovek i Stikhiya* (Leningrad), Vyp. 11, 1973, p. 137–38. [General account of Soviet sea ice forecasting since 1920.]

WADHAMS, P. *Sea ice morphology in the Beaufort Sea*. Victoria, B.C., Dept. of the Environment. Beaufort Sea Project, 1975. 66 p. (Beaufort Sea Technical Report No. 36.) [Quantitative description of pressure ridge and keel distributions, which is then used as basis for speculation on how spread of oil under ice may be affected by ice morphology.]

YEVSEYEV, V. V. Statsionarnyye polyn'i Antarktiki po sputnikovym dannym [Stationary polynyas of the Antarctic from satellite data]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 91, 1975, p. 20–27. [Study of coastal region of Antarctica, 1970–71.]

GLACIAL GEOLOGY

ALLARD, M. L'étude morphométrique des formes d'accumulation glaciaires et fluvioglaciaires à l'aide de la photo aérienne. Quelques exemples des Laurentides. *Cahiers de Géographie de Québec*, Vol. 19, No. 47, 1975, p. 383–93. [Photo interpretation shows relation between nature of deposits and terrain where they are deposited.]

ASOYAN, D. S. Novyye fakty o sledakh chetvertichnogo oledeneniye Chul'manskogo plato [New data on traces of the Quaternary glaciation of the Chul'man plateau]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya*, 1975, No. 4, p. 76–84. [Southern Yakutskaya A.S.S.R.]

BARDIN, V. I. Glyatsiogeomorfologiya lednika Lamberta i yego gornogo obramleniya [Glaciomorphology of the Lambert Glacier and its mountain setting]. *Antarktida. Doklady Komissii*, Vyp. 14, 1975, p. 110–27.

BESSARABOV, V. I. O stadial'nosti poslednego pleystotsenovogo oledeneniya Shpitsbergena [On stages of development of Pleistocene glaciation of Svalbard]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva*, Tom 107, Vyp. 5, 1975, p. 457–61.

BLACK, R. F. Late-Quaternary geomorphic processes: effects on the ancient Aleuts of Umnak Island in the Aleutians. *Arctic*, Vol. 28, No. 3, 1975, p. 159–69. [Discusses some aspects of glaciation, and other natural processes, that would have affected the Aleuts who settled in this region about 8 400 B.P.]

CHEBOTAREVA, N. S., *and* FAUSTOVA, M. A. Struktur und Dynamik der letzten europäischen Eisbedeckung. *Petermanns Geographische Mitteilungen*, Jahrg. 119, Quartalsht. 4, 1975, p. 253–60. [Suggests behaviour of Quaternary ice sheet centred on Scandinavia.]

CROSS, P., *and* HODGSON, J. M. New evidence for the glacial diversion of the River Teme near Ludlow, Salop. *Proceedings of the Geologists' Association*, Vol. 86, Pt. 3, 1975, p. 313–31. [(Formerly Shropshire,) England.]

CULLINGFORD, R. A. Scenery of Britain. High and low lands of Scotland. *Geographical Magazine*, Vol. 48, No. 8, 1976, p. 478–85. [Includes effects of glaciation.]

DANIEL, E. Glacialgeologi inom kartbladet Moskosel i mellersta Lappland. *Sveriges Geologiska Undersökning. Översiktskartor med Beskrivningar*, Ser. Ba, Nr. 25, 1975, 121 p. [Describes Quaternary deposits of Moskosel region, north Sweden. English summary, p. 112–15.]

DOBRODEYEV, O. P. Zhiboye veshchestvo i oledeneniya Zemlya [Living matter and glaciations of the Earth]. *Priroda*, 1975, No. 6, p. 66–71. [Discusses and discards concept that CO_2 depletion may cause next glaciation. Human activity small effect.]

EMILIANI, C., *and others*. Paleoclimatological analysis of late Quaternary cores from the northeastern Gulf of Mexico, [by] C. Emiliani [and 7 others]. *Science*, Vol. 189, No. 4208, 1975, p. 1083–88. [Cores indicate episode of rapid ice melting and sea-level rise about 9 600 yrs B.P., which coincides with Valders ice readvance.]

FLINT, R. F., *and* GEBERT, J. A. Latest Laurentide ice sheet: new evidence from southern New England. *Geological Society of America. Bulletin*, Vol. 87, No. 2, 1976, p. 182–88. [Discusses implications of discovery of two late Wisconsin end moraines in Connecticut.]

GELLERT, J. F. 100 Jahre Glazialtheorie und das quartäre Erdbild von heute. *Petermanns Geographische Mitteilungen*, Jahrg. 119, Quartalsht. 4, 1975, p. 241–52. [Describes development of Quaternary ice age theory, proceeding from a local to a global interpretation.]

GOLUBEV, G. N. Osobennosti proryvov lednikovo-podprudnykh ozer razlichnykh tipov [The peculiarities of outbursts of glacier-dammed lakes of different types]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 155–63. [Discusses causes of outbursts. English summary, p. 163.]

GROSVAL'D, M. G. O veroyatnoy roli katastroficheskikh razlivov lednikov (serdzhey) v razrastanii i degradatsii lednikovykh pokrovov proshlogo [On the probable role of glacier surges in the growth and decay of former ice sheets]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 164–69. [Discusses palaeo-surges in relation to climatic variations. English summary, p. 168–69.]

GROSVAL'D, M. G., *and others*. Lednikovaya stadiya Markhida-Vel't: dvoynoy serdzh Barentseva lednikovogo shchita? [The glacial stage Markhida-Vel't: a second surge of the Barents ice shelf?]. [By] M. G. Grosval'd, A. S. Lavrov, L. M. Potapenko. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 173–88. [Radiocarbon dating of wood and peat samples from moraine of Barents Sea coast suggests Pleistocene double surge of Barents ice sheet. English summary, p. 188.]

GUILCHER, A. Présence de plages éémiennes/normaniennes dans l'Ouest et le Sud de la République de Corée et conséquences géomorphologiques. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences* (Paris), Sér. D, Tom. 282, No. 2, 1976, p. 149–51. [Remnants of old beaches found below periglacial deposits along western and southern coasts of Korea. Evidence for an Eemian age as in similar West European beaches and for stability of Korea during upper Quaternary.]

HERD, D. G., *and* NAESER, C. W. Radiometric evidence for pre-Wisconsin glaciation in the northern Andes. *Geology*, Vol. 2, No. 12, 1974, p. 603–04. [Lateral moraine on Nevado del Ruiz, Colombia, is older than volcanic ash dated by fission tracks at 100 000 years.]

KING, C. A. M. Some comments on the glacial geomorphology of the Viborg area of Jutland, Denmark. *Geografisk Tidsskrift*, Bd. 74, 1975, p. 1–11. [Fabric analyses and morphology suggest ice shaped deposits and eroded Hald Sø valley. Tunnel valleys probably cut subglacially by melt water as ice became stagnant.]

KLIEWE, H. Spätglaziale Marginalzonen auf der Insel Rügen — Untersuchungsergebnisse und Anwendungsbereiche. *Petermanns Geographische Mitteilungen*, Jahrg. 119, Quartalsht. 4, 1975, p. 261–69. [Presents two maps of marginal zones of late Weichselian period on Rügen island, East Germany, based on field work and literature and map evaluation.]

MACPHAIL, M. K., *and* PETERSON, J. A. New deglaciation dates from Tasmania. *Search* (Sydney), Vol. 6, No. 4, 1975, p. 127–30. [New dates based on pollen analysis.]

MYAGKOV, S. M. Sovremennoye sostoyaniye i drevniye moreny lednika Mezerv (sukhiye doliny Zemli Viktorii) [Present-day condition and ancient moraines of the Meserve Glacier dry valleys of Victoria Land]. *Antarktika. Doklady Komissii*, Vyp. 14, 1975, p. 97–109.

PEACOCK, J. D. Landslip associated with glacier ice. *Scottish Journal of Geology*, Vol. 11, Pt. 4, 1975, p. 363–64. [Letter. Draws attention to ice-carried slip debris on Isle of Eigg.]

RICE, J. Scenery of Britain. Hand of man on the Midland plains. *Geographical Magazine*, Vol. 48, No. 7, 1976, p. 415–22. [Includes photographs and descriptions of effects of Quaternary glaciation (deposition and erosion) which persist despite man's activities.]

ROSENQVIST, I. T. Chemical investigation of tills in the Numedal. *Geologiska Föreningens i Stockholm Förhandlingar*, Vol. 97, Pt. 3, No. 562, 1975, p. 284–86. [Concludes till in this valley of south Norway originated by mixing of preglacially weathered material with unweathered bedrock material.]

SEREBRYANNIY, L. R. Veroyatnyye sledy lednikovikh pul'satsiy na ravninakh sredney polosy Yevropy v pozdnem pleystotsene [Probable traces of glacier fluctuations on the plains of the middle zone of Europe in the late Pleistocene]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 169–73. [Morphological indications of glacier surges analysed with reference to marginal processes during maximum extent of Upper Pleistocene ice cover. English summary, p. 173.]

SINGH, G., *and* AGRAWAL, D. P. Radiocarbon evidence for deglaciation in north-western Himalaya, India. *Nature*, Vol. 260, No. 5548, 1976, p. 232. [Evidence suggests date 14 000–15 000 yr B.P.]

SISSONS, J. B. Lateglacial marine erosion in south east Scotland. *Scottish Geographical Magazine*, Vol. 92, No. 1, 1976, p. 17–29. [Considers evidence for this feature, lying below present sea-level.]

SVITOCH, A. A., *and* KHOREV, V. S. Drevniye lednikovyye otlozheniya i oledeneniya Gornogo Altaya [Ancient glacial deposits and glaciation of Altayskiy Kray]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya*, 1975, No. 4, p. 101–08.

TELLER, J. T. Lake Agassiz deposits in the main offshore basin of southern Manitoba. *Canadian Journal of Earth Sciences*, Vol. 13, No. 1, 1976, p. 27–43. [Discusses nature of glaciofluvial deposits.]

TIJA, H. D. Holocene eustatic sea levels and glacio-isostatic rebound. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 22, 1975, p. 57–71. [Proposes theory that explains absence of Daly strandlines in northern hemisphere and their presence along many coasts of southern hemisphere.]

TINSLEY, H. M., *and* DERBYSHIRE, E. Late-glacial and postglacial sedimentation in the Peris-Padarn rock basin, North Wales. *Nature*, Vol. 260, No. 5548, 1976, p. 234–38. [Observations on Quaternary deposits.]

WATKINS, N. D., *and others*. Ice-rafted debris in *Eltanin* deep-sea sedimentary cores, [by] N. D. Watkins, J. Keany, M. Ledbetter and T.-C. Huang. *Antarctic Journal of the United States*, Vol. 10, No. 5, 1975, p. 258–59. [Testing of model suggesting ice-rafted debris may be associated with glacial periods in low latitudes and with interglacial periods in higher latitudes nearer to iceberg sources.]

WEERTMAN, J. Milankovich solar radiation variations and ice age ice sheet sizes. *Nature*, Vol. 261, No. 5555, 1976, p. 17–20. [Calculations show that Milankovich solar radiation variations are sufficient to produce large variations in size of ice age ice sheets.]

YEVTEYEV, S. A. O glyatsioizostazii Antarktidy [On glacioisostasy of Antarctica]. *Antarktika. Doklady Komissii*, Vyp. 14, 1975, p. 87–96.

YOUNG, J. A. T. A re-interpretation of the deglaciation of Abernethy Forest, Inverness-shire. *Scottish Journal of Geology*, Vol. 11, Pt. 3, 1975, p. 193–205. [Based on contemporary knowledge of glacial hydrology and ice sheet wastage processes.]

FROST ACTION ON ROCKS AND SOIL. FROZEN GROUND. PERMAFROST

BROWN, R. J. E. Permafrost investigations in Quebec and Newfoundland (Labrador). *Canada. National Research Council. Division of Building Research. Technical Paper* No. 449, 1975, [104] p. [Describes distribution in southern part of discontinuous zone and discusses relationship to climatic and terrain factors. Analyses air photograph patterns.]

CRAMPTON, C. B. Landscape mapping in the Mackenzie River valley. *Arctic*, Vol. 28, No. 4, 1975, p. 284–94. [Terrain evaluated on basis of vegetation–landform patterns, identifiable on air photographs as landscape units which could be grouped into regions with climatic connotations. Ground inspection showed each landscape unit comprised complex of elements characterized by permafrost relationships.]

FRENCH, H. M. Pingo investigations, Banks Island, District of Franklin. Project 640004. *Canada. Geological Survey. Paper* 76-1A, Pt. A, 1976, p. 235–38. [Pingo distribution map compiled and pingo-like mounds and ridges examined.]

GRISHIN, I. S. Svyaz' snezhnogo pokrova s rasprostraneniyem vechnoy merzloty [The relationship of snow cover with the spreading of permafrost]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 243–47. [This relationship depends on vegetation and degree of snow drifting. Compares different regions of U.S.S.R. English summary, p. 247.]

HAGEDORN, J. Note on the occurence [*sic*] of needle ice phenomena in the southern Sinai mountains. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 21, 1974, p. 35–38. [Below periglacial belt.]

HENOCH, W. E. S., *and others*. Some ice-induced landforms in the Mackenzie delta, by W. E. S. Henoch D. N. Outhet, M. L. Parker. *Canada. Task Force on Northern Oil Development. Environmental-Social Committee, Northern Pipelines. Report* No. 74-35, 1974, p. 81–110. [Describes unusual humps, probably formed by interaction of flooding, vegetation growth, sedimentation and cryogenic processes.]

JAHN, A. *Problems of the periglacial zone (Zagadnienia strefy peryglacjalnej). Translated from Polish by Jerzy Bachrach.* Warsaw, Państwowe Wydawnictwo Naukowe for the National Science Foundation, Washington, D.C., 1975. xi, [252] p. (TT 72-54011.) [Original Polish edition published Warsaw, 1971. Translation available from U.S. Dept. of Commerce. National Technical Information Service, Springfield, Virginia 22161.]

JUDGE, A. S., *and others*. Anomalous shallow seismic velocities in Mackenzie Bay, Northwest Territories. Project 740102, [by] A. S. Judge, H. A. MacAulay and J. A. Hunter. *Canada. Geological Survey. Paper* 76-1A, Pt. A, 1976, p. 481–84. [Results complicated by presence of aggrading and degrading permafrost.]

JUDGE, A. S., *and others*. Thermistor cable installations in permafrost materials with a water-jet drilling method. Project 730006, [by] A. S. Judge, J. A. Hunter, R. L. Good, J. Cowan and G. Robb. *Canada. Geological Survey. Paper* 76-1A, Pt. A, 1976, p. 479–80. [Drilling rates of 0.2–0.3 m/min. achieved, using sea-water at about 6°C as drilling fluid.]

KUYDOWICZ-TURKOWSKA, K. Rzeczne procesy peryglacjalne na tle morfogenezy doliny Mrogi [Periglacial fluvial processes as the basis of the morphogenesis of the Mroga valley]. *Acta Geographica Lodziensia*, Nr. 36, 1975, 122 p. [Reconstruction of periglacial fluvial processes in Mroga valley, Poland, at time of retreat of Warta glacier during Holocene. French summary, p. 110–22.]

LAING, J. M. Engineering in the north—a review of the engineering problems of permafrost and muskeg regions. *Canada. National Research Council. Associate Committee on Geotechnical Research. Technical Memorandum* No. 110, 1974, p. 1–29. [Reference to building foundations, water supply dams, sewer and water systems, roads, railways, and airstrips.]

LÖFFLER, E. Beobachtungen zur periglazialen Höhenstufe in den Hochgebirgen von Papua New Guinea. *Erdkunde*, Bd. 29, Ht. 4, 1975, p. 285–92. [Observations on periglacial features in high mountains of Papua New Guinea.]

MACKAY, J. R. Ice segregation at depth in permafrost. Project 680047. *Canada. Geological Survey. Paper* 76-1A, Pt. A, 1976, p. 287–88. [Segregated ice could probably grow to depths of 200 m.]

MACKAY, J. R. Ice-wedges as indicators of recent climatic change, western Arctic coast. Project 680047. *Canada. Geological Survey. Paper* 76-1A, Pt. A, 1976, p. 233–34. [Secondary and tertiary ice wedges have grown recently along coast in response, probably, to post-1950 cooling trend.]

MACKAY, J. R. Pleistocene permafrost, Hooper Island, Northwest Territories. Project 680047. *Canada. Geological Survey. Paper* 76-1A, Pt. A, 1976, p. 17–18. [Describes fossil ice wedges in glacially deformed sediments.]

NIXON, J. F., *and* MCROBERTS, E. C. A design approach for pile foundations in permafrost. *Canadian Geotechnical Journal*, Vol. 13, No. 1, 1976, p. 40–57. [Proposes design philosophy whereby pile settlements over design life of structure are retained within acceptable limits, based on knowledge of creep rate of foundation soil.]

SHAMANOVA, I. I. Geokriologicheskiye usloviya tsentral'noy chasti Sibirskikh Uvalov [Geocryological conditions of the central part of Sibirskiyye Uvaly]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya*, 1975, No. 4, p. 109–16. [Thermokarst landscapes studied in West Siberian lowland, Tyumenskaya Oblast'.]

SHVARTSEV, S. L. Geokhimicheskaya deyatel'nost' merzloty [Geochemical activity of frost]. *Priroda*, 1975, No. 7, p. 66–73. [Examples of landscape and surface forms in northern Krasnoyarskiy Kray resulting from frost action.]

SIMON, T., *and* CAILLEUX, A. Sur un marécage réticulé du Nord canadien. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences* (Paris), Sér. D, Tom. 282, No. 8, 1976, p. 691–94. [Describes reticulate marsh at Great Whale River, Quebec (mean annual temperature −4.3°C). Possibly formed by emergence of former *schorre* channels, freshened by winter ice.]

STONE, P. An unusual form of patterned ground, Cooper Bay, South Georgia. *British Antarctic Survey Bulletin*, Nos. 41 and 42, 1975, p. 195–97. [Lines of tussock grass (*Poa flabellata*) form series of large-scale non-sorted stripes. Origin discussed; would not require periglacial conditions.]

TARNOCAI, C., *and* NETTERVILLE, J. A. Some characteristics of a pingo in the Simpson Peninsula, N.W.T. *Canadian Journal of Earth Sciences*, Vol. 13, No. 3, 1976, p. 490–92. [Pingos are hitherto unrecorded in this locality.]

THORN, C. E. Influence of late-lying snow on rock-weathering rinds. *Arctic and Alpine Research*, Vol. 7, No. 4, 1975, p. 373–78. [Data from snow-patch in Colorado Front Range indicate that late-lying snow may increase rock-weathering thicknesses two or three times.]

TOLSTIKHIN, O. N. Kriopegi—kholodnyye vody zemli [Cryopegs—cold waters of the earth]. *Chelovek i Stikhiya* (Leningrad), Vyp. 11, 1973, p. 29–30. [Problems in studying underground waters in permafrost of northern U.S.S.R.]

U.S. NATIONAL RESEARCH COUNCIL. COMMITTEE ON PERMAFROST. *Opportunities for permafrost-related research associated with the trans-Alaska pipeline system. Report of workshop, March 19–22, 1975, Scottsdale, Arizona.* Washington, D.C., National Academy of Sciences, 1975. xi, 37 p. [Considers three main subject areas: geotechnical interaction of permafrost and man-made facilities; permafrost and related geologic documentation, mapping and analysis; interaction of hydrologic and permafrost-related parameters and processes.]

VELICHKO, A. A., *and* BERDNIKOV, V. V. Vtoraya zhizn' drevney merzloty [A second life of ancient permafrost]. *Priroda*, 1975, No. 11, p. 95–105. [Palaeogeographical study of effect of permafrost on relief, particularly in the U.S.S.R.]

VOTYAKOV, I. N. *Fiziko-mekhanicheskiye svoystva merzlykh i ottaivayushchikh gruntov Yakutii* [*Physical and mechanical properties of frozen and thawing-out soils of Yakutiya*]. Novosibirsk, "Nauka", 1975. 176 p.

WASHBURN, A. L. Analysis of permafrost cores from Antarctic dry valleys. *Antarctic Journal of the United States*, Vol. 10, No. 5, 1975, p. 238–39. [Describes laboratory investigations to determine depositional environments and glacial history.]

YAKUPOV, V. S., *and* KLIMOVSKIY, I. V., *ed. Regional'nyye i tematicheskiye geokriologicheskiye issledovaniya* [*Regional and thematic geocryological studies*]. Novosibirsk, Izdatel'stvo "Nauka", 1975. 155 p. [Collection of 20 articles.]

ZOLTAI, S. C. Tree ring record of soil movements on permafrost. *Arctic and Alpine Research*, Vol. 7, No. 4, 1975, p. 331–40. [Trees growing on hummocky permafrost terrain are subject to periodic tilting, which is recorded as compression wood. Implications discussed.]

METEOROLOGICAL AND CLIMATOLOGICAL GLACIOLOGY

ANTONOV, V. S. Ledovyy pokazatel' sovremennoy tendentsii pokholodaniya klimata v nizov'yakh Yeniseya [Ice conditions as index of the present trend in cooling of the climate in the lower Yenisey]. *Problemy Arktiki i Antarktiki*, Vyp. 46, 1975, p. 84–90. [Forecasts that cooling will continue into the 1980's.]

BÖHM, R. Lufttemperaturen bei Schneefall von grösserer Ergiebigkeit in Wien. *Wetter und Leben*, Jahrg. 27, Ht. 1–2, 1975, p. 133–37. [Based on snowfall records in Vienna, 1934–73, where snow cover shows increase of 5 cm or more. Relation of snowfall to air temperature shown in form of histogram.]

DERBYSHIRE, E., *and* BLACKMORE, R. Meteorological observations at Blaisen, Hardangerjokulen ice cap, Norway, 26th August–9th September 1972. *Journal of Meteorology* (Trowbridge), Vol. 1, No. 2, 1975, p. 59–66. [Two adjacent sites studied concurrently, one on rock, other on perennial snow. Results compared and discussed.]

KNIGHT, C. A., *and others*. Radial and tangential variation of deuterium in hailstones, [by] C. A. Knight, D. H. Ehhalt, N. Roper and N. C. Knight. *Journal of the Atmospheric Sciences*, Vol. 32, No. 10, 1975, p. 1990–2000. [Measurements, together with crystal size and air bubble content. D measurement gives valuable evidence of relative height of formation.]

MCCULLOUGH, E. A., *and* SMITH, G. G. Correction in the glacial–postglacial temperature difference computed from amino acid racemization. *Science*, Vol. 191, No. 4222, 1976, p. 102–03. [Comment on effect exponential dependence of rate constant on temperature has on this method of deducing temperature difference as deduced by R. A. Schroeder and J. L. Bada, ibid., Vol. 182, No. 4111, 1973, p. 479–82, and reply by Schroeder and Bada.]

MCFADDEN, T. T. Suppression of ice fog from power plant cooling ponds. *Dissertation Abstracts International*, B, Vol. 36, No. 9, 1976, p. 4638-B. [Comparison of ice cover and monomolecular films as methods of suppressing ice fog. Abstract of Ph.D. thesis, University of Alaska, 1974. University Microfilms order no. 76-5267.]

MICHAELI, G., *and* GALLILY, I. Growth rates of freely falling ice crystals. *Nature*, Vol. 259, No. 5539, 1976, p. 110. [Letter. Laboratory measurements of crystals produced in and falling freely through fogs of supercooled droplets.]

OSTROŽLÍK, M. Jahresgang der Nebelfrostablagerungen auf dem Chopok und Lomnický Štít. *Contributions of the Institute of Meteorology and Climatology of the Slovak Academy of Sciences* (Bratislava), 1, 1974, p. 75–96. [Presents results of measuring rime by the Polansky method in the high mountain region of the western Carpathians, 1957–67.]

RADOK, U., *and others*. Atmosphere and ice, [by] U. Radok, N. Streten and G. E. Weller. *Oceanus* (Woods Hole, Mass.), Vol. 18, No. 4, 1975, p. 16–27. [Discusses effect of air–sea-ice interactions on global climate, with reference to conditions in the Southern Ocean.]

SCHLAMP, R. J., *and others*. A numerical investigation of the efficiency with which simple columnar ice crystals collide with supercooled water drops, [by] R. J. Schlamp, H. R. Pruppacher and A. E. Hamielec. *Journal of the Atmospheric Sciences*, Vol. 32, No. 12, 1975, p. 2330–37. [Solution of Navier–Stokes equation used to deduce trajectory of droplets relative to cylinder and hence conditions for riming.]

STEINER, K. C., *and* WRIGHT, J. W. Douglas-fir Christmas trees: variation in frost susceptibility and time of leafing out in Michigan. *Michigan Academician*, Vol. 7, No. 2, 1974, p. 185–90. [Marked racial differences observed in *Pseudotsuga menziesii*, which can be important in choice of stock for plantations.]

STRUEMPLER, A. W. Trace metals in rain and snow during 1973 at Chadron, Nebraska. *Atmospheric Environment*, Vol. 10, No. 1, 1976, p. 33–37. [Analysis for seven metals including Ag which is largely attributed to human activity, possibly cloud seeding.]

SUPER, A. B., *and others*. Field observations of the persistence of AgI-NH_4I-acetone ice nuclei in daylight, [by] A. B. Super and J. T. McPartland, J. A. Heimbach, Jr. *Journal of Applied Meteorology*, Vol. 14, No. 8, 1975, p. 1572–77. [Method of estimating persistence of this seeding agent. Results discussed in connection with possible cloud seeding beyond intended area.]

VAN VALIN, C. C., *and others*. Cloud and ice nuclei from human activities, by C. C. Van Valin, R. F. Pueschel, F. P. Parungo and R. A. Proulx. *Atmospheric Environment*, Vol. 10, No. 1, 1976, p. 27–31. [Results show natural production of ice nuclei during windy periods greatly exceeds man-made production during pollution episodes.]

SNOW

ADAMCHUK, N. N. Kolichestvennaya otsenka perenosa snega pri metelyakh i pozynkakh v Ukrainskikh Karpatakh [Quantitative evaluation of snow transportation during snow drifting in the Ukrainian Carpathians]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 220–22. [English summary, p. 222.]

AKIF'YEVA, K. V. Ispol'zovaniye izmenchivosti rastitel'nosti v zalesennykh rayonakh pri opredelenii rezhima lavinnoy deyatel'nosti [Influence of avalanches on vegetation in forested areas and utilization of vegetation for determining avalanche regime]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 212–17. [Describes studies in central Caucasus. English summary, p. 216–17.]

ANDERSON, J. C., *and* DURRANT, R. L. Hydrologic reconnaissance, Thomsen River basin, Banks Island, District of Franklin. Project 740079. *Canada. Geological Survey. Paper* 76-1A, Pt. A, 1976, p. 221–27. [Includes contribution of snow and ice to run-off.]

BARKOV, N. I. Akkumulyatsiya snega na profile Mirnyy–Vostok v 1970–73 gg. [Snow accumulation along the Mirny–Vostok profile in 1970–73]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 255–57. [English summary, p. 259.]

BARNES, J. C., *and others*. *Snow mapping applications of thermal infrared data from the NOAA satellite very high resolution radiometer (VHRR), by J. C. Barnes, C. J. Bowley, J. L. Cogan.* Concord, Mass., Environmental Research and Technology, 1974. viii, 72 p. (ERT Document No. 0438-F. Final report. Prepared for Dept. of Commerce, National Oceanic and Atmospheric Administration, National Environmental Satellite Service.) [Discusses results which compare favourably with scanning radiometer data, and points out problems of snow cover mapping in mountainous terrain where temperature differences due to variations in elevation may obscure those associated with snow cover.]

BERGEN, J. D. A possible relation of albedo to the density and grain size of natural snow cover. *Water Resources Research*, Vol. 11, No. 5, 1975, p. 745–46. [Proposes simple model which suggests that, for grain sizes greater than 1.5 mm, density is main factor governing albedo.]

BROWN, R. T. Furnace fuel, air pollution accumulated in snow and lichen growth on trees. *Michigan Academician*, Vol. 7, No. 2, 1974, p. 149–56. [Particulate matter, sulphates and chlorides in accumulated snow, sampled March 1970, showed effects of inversion layer in valley, and, in 1973, of smokeless fuels.]

CANADA. NATIONAL RESEARCH COUNCIL. ASSOCIATE COMMITTEE ON GEODESY AND GEOPHYSICS. SUB-COMMITTEE ON HYDROLOGY. *Bibliography of hydrology; Canada 1971–1973*. Ottawa, Dept. of the Environment and National Research Council, [1975]. v, 410 p. [Includes ice and snow in section on surface water.]

COATS, R. N., *and others*. Removal of nitrogen from snowmelt water by the soil-vegetation system, Lake Tahoe basin, California, by R. N. Coats, R. L. Leonard and S. L. Loeb. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 98–105. [Presents studies of atmospheric sources of nitrogen in Ward Creek, and aspects of its uptake by soil and vegetation and of its effect on colour and clarity of lake.]

COLBECK, S. C. A theory for water flow through a layered snowpack. *Water Resources Research*, Vol. 11, No. 2, 1975, p. 261–66. [Presents theoretical model.]

DAVIS, R. J. Weather modification law and the environmental effects of snowpack enhancement. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 41–47. [Outlines federal and state laws affecting weather modification in the U.S.A.]

DELING, E. L. Tech toots and snow descriptors. *Michigan Academician*, Vol. 7, No. 4, 1975, p. 489–500. [Humorous account of terms used by students at Michigan Technological University to describe snow.]

DEMIN, A. G. Rol' nival'nykh i zimnikh eolovykh protsessov v formirovanii rel'yefa Predaltayskoy ravniny [The role of nival and winter aeolian processes in the formation of pre-Altay lowland relief]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 230–33. [Describes fluvial dunes of snow and sand of wind-borne origin in Altayskiy Kray. English summary, p. 233.]

DORONIN, A. N. Khimicheskiy sostav poverkhnostnogo snega v rayone stantsii Vostok i po marshrutu Mirny–Vostok [Chemical composition of surface snow in the Vostok station area and along the Mirny–Vostok traverse]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 91, 1975, p. 62–69.

EARNEY, F. C. F., *and* KNOWLES, B. A. Urban snow hazard: Marquette, Michigan. (*In* White, G. F., *ed. Natural hazards. Local, national, global*. New York, etc., Oxford University Press, 1974, p. 167–74.) [Discussion of nature of the hazards and of steps taken to prepare for it in this location where over 2 500 mm snow falls in 7 out of 10 years.]

FARHAR, B., *and* MEWES, J. Public response to proposed snowpack augmentation in the Sierra Nevada. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 48–58. [Examines nature of various questions and comments presented at 21 public information meetings on proposed project for northern Sierra Nevada mountains, California, U.S.A.]

FINDLAY, B. F. Snow maps for the Canadian hydrological atlas. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 79–86. [Describes atlas, due for publication in 1976, with particular reference to snow cover maps.]

FLOCCHINI, G. Caratteri del manto nevoso in alcune stazioni alpine. *Rivista Italiana di Geofisica e Scienze Affini*, Vol. 1 (Speciale), 1975, p. 120–24. [Compares and discusses thickness and duration of snow cover, number of days of snowfall, and amount of new snow at various locations at 770 m a.s.l. on opposite sides of Po valley, Italy, 1966–73. English summary, p. 124.]

FRISCH, A. S., *and others*. Secondary flow fields in the planetary boundary layer estimated from dual-Doppler radar measurements during snow conditions, [by] A. S. Frisch, L. J. Miller and R. G. Strauch. *Journal of Geophysical Research*, Vol. 80, No. 36, 1975, p. 5051–60. [Results show definite patterns of flows, with scale sizes and distribution of energy consistent with secondary flow model.]

GAPISHKO, V. G. Zakonomernosti raspredeleniya snegozapasov v basseyene reki Kyzylchi (zapadnyy Tyan'-Shan') [Regularities of the distribution of snow reserves in the Kyzylcha river basin (western Tyan'-Shan')]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 217–20. [Observations on snow accumulation. English summary, p. 220.]

GARY, H. L. Airflow patterns and snow accumulation in a forest clearing. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 106–13. [Study shows marked effect of air flow pattern on increased snow depths in clearings at expense of snow depths in adjacent forest.]

GORDON, S. Unusual deposit of fine soil on a semi-permanent Cairngorm snowfield. *Journal of Meteorology* (Trowbridge), Vol. 1, No. 2, 1975, p. 70. [Describes layer of fine "foreign" soil overlying snow of The Laird's Table Cloth, Beinn a' Bhuird, eastern Cairngorm Mountains, Scotland.]

GRUDININ, G. V. Zavisimost' termicheskogo rezhima pochv vysoty snezhnogo pokrova v Minusinskoy kotlovine i yeye gornom obramlenii [The dependence of the thermal regime of soils on the thickness of snow cover in the Minusinsk basin and adjoining mountains]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 233–38. [Western Sayan, Tuvinskaya Avtonomaya Oblast'. English summary, p. 238.]

HANNAFORD, J. F., *and* HOWARD, C. H. Upper air data as a parameter in estimating snowmelt runoff. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 114–18. [Reports experiences with hydrologic models operated in Kings River basin and San Joaquin River watershed, California, U.S.A.]

HORTON, D. D. Automated remote data acquisition. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 10–13. [Presents methodology for determining optimum components comprising automated remote data acquisition system from available alternatives.]

KAMALOV, L. F. Vliyaniye snezhnogo pokrova na migratsiyu khimicheskikh elementov v gornykh landshaftakh [Effect of snow cover on migration of chemical elements in mountain landscapes]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 204–07. [Discusses importance of snow as agent for migration of chemicals. English summary, p. 207.]

KOBAYASHI, T., *and others*. On twinned structures in snow crystals, [by] T. Kobayashi and Y. Furukawa and K. Kikuchi and H. Vyeda. *Journal of Crystal Growth*, Vol. 32, No. 2, 1976, p. 233–49. [Possible twinned structures in ice Ih structure discussed and applied to observed "peculiar" snow crystals.]

KONONOVA, N. N. Nekotoryye osobennosti formirovaniya snezhnogo pokrova na poberezh'ye severo-zapadnogo Sakhalina [Some peculiarities of snow cover formation in the coastal areas of north-west Ostrov Sakhalin].

Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya, Vyp. 24, 1974, p. 238–41. [Study of snow formations due to drifting and topography. English summary, p. 241.]

KORONKEVICH, N. I. Raspredeleniye snegozapasov po otdel'nym elementam landshafta i formirovaniye stoka [Distribution of snow reserves depending on landscape features and run-off formation]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 196–200. [Effect of agricultural techniques on snow redistribution and, hence, run-off. English summary, p. 200.]

KOVALEV, P. V., *and others*. O geomorfologicheskoy i landshaftoobrazuyushchey deyatel'nosti sezonnogo snezhnogo pokrova na territorii Levoberezhnoy Ukrainy [On geomorphological and landscape-forming activity of seasonal snow cover in the eastern Ukraine region]. [By] P. V. Kovalev, V. L. Vilenkin, V. A. Maksimenko. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 225–30. [Discusses geomorphological effects of snow cover. English summary, p. 230.]

LUCES, S. A., *and others*. *The AFGWC snow cover analysis model, by S. A. Luces, S. J. Hall and J. D. Martens*. Offutt Air Force Base, Maine, U.S. Air Force. Air Weather Service, 1975. iii, 16 p. (AFGWC Technical Memorandum 75-1.) [Describes data input, analysis procedures, problems and possible improvements, and potential uses of Air Force Global Weather Central (AFGWC) model.]

MCGINNIS, D. F., *jr., and others*. Determination of snow depth and snow extent from NOAA 2 satellite very high resolution radiometer data, [by] D. F. McGinnis, Jr., J. A. Pritchard and D. R. Wiesnet. *Water Resources Research*, Vol. 11, No. 6, 1975, p. 897–902. [Presents results obtained following heavy snowstorm over southeastern United States in February 1973.]

MAKSIMOV, N. V. Snezhnyy obval na Chichkane [Snow avalanche in the Chichkan valley]. *Chelovek i Stikhiya* (Leningrad), Vyp. 13, 1975 (pub. 1974), p. 71. [Avalanche occurred 28 March 1972, Kirgizskaya S.S.R.]

MEIER, M. F. Applications of ERTS imagery to snow and glacier hydrology. (*In* Bock, P., *and others, ed. COSPAR. Approaches to Earth survey problems through use of space techniques. Proceedings of the symposium held in Constance, F.R.G. 23–25 May 1973. Edited by P. Bock, with the assistance of F. W. G. Baker and S. Ruttenberg*. Berlin, Akademie-Verlag, 1974, p. 329–34.) [Brief survey.]

MEIER, M. F. New ways to monitor the mass and areal extent of snow cover. (*In* Bock, P., *and others, ed. COSPAR. Approaches to Earth survey problems through use of space techniques. Proceedings of the symposium held in Constance, F.R.G. 23–25 May 1973. Edited by P. Bock, with the assistance of F. W. G. Baker and S. Ruttenberg*. Berlin, Akademie-Verlag, 1974, p. 241–50.) [Reviews and discusses problems in surveying snow cover by means of satellites.]

NAKAWO [i.e. NAKAO], M. Fabric studies on a 1 meter-deep snow core from Mizuho plateau, east Antarctica. *Nankyoku Shiryō: Antarctic Record*, [No.] 54, 1975, p. 68–74. [Study of snow densification.]

OUTCALT, S. I., *and others*. Computer simulation of the snowmelt and soil thermal regime at Barrow, Alaska, [by] S. I. Outcalt, C. Goodwin, G. Weller and J. Brown. *Water Resources Research*, Vol. 11, No. 5, 1975, p. 709–15. [Simulator predicts snow fence array producing drift deeper than 4.2 m will initiate permanent snow-field at Barrow, serving as source of fresh water.]

PÉCZELY, G. Das Höhensystem der Schneeschmelze in den Alpen und Karpaten. *Rivista Italiana di Geofisica e Scienze Affini*, Vol. 1 (Speciale), 1975, p. 90–92. [Attempt to correlate altitude with monthly precipitation (including snow) and hence run-off.]

PETZOLD, D. E. *Solar and net radiation over snow*. Montreal, McGill University. Dept. of Geography, 1974. [xiv], 77 p. [Primary objective of study was use of modern micrometeorological methods to update current snow melt prediction models.]

RAMSLI, G. Avalanche problems in Norway. (*In* White, G. F., *ed. Natural hazards. Local, national, global*. New York, etc., Oxford University Press, 1974, p. 175–80.) [Describes avalanche hazard and measures taken to counteract it.]

RIKHTER, G. D., *and others*. Landshaftnoye snegovedeniye (sovremennoye sostoyaniye, zadachi i perspektivy) [The environmental study of snow cover (present knowledge, problems and prospects)]. [By] G. D. Rikhter, V. M. Kotlyakov, Ye. A. Nefed'yeva. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 192–96. [Discusses various effects of snow on landscape. English summary, p. 196.]

SHAFER, B. A., *and* FARNES, P. E. Interpreting snow survey data for use in environmental planning. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 71–78. [Stresses importance of forecasting water supply by monitoring snowfalls.]

SHALATOVA, L. I. Problemy izucheniya snezhnikov [Problems in the study of firn]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 241–43. [Study of snow-patches in Central Asia. English summary, p. 243.]

SHCHERBAN', M. I., *and* LOK, NONG THI. Zakonomernosti raspredeleniya snezhnogo pokrova v doline Dnepra [On the regularities of the distribution of snow cover in the Dnepr valley]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 222–25. [Examines meteorological observations and records of snow cover for period 1946–69. English summary, p. 225.]

SMILEY, V. N., *and others*. South Pole ice crystal precipitation studies using lidar sounding and replication, [by] V. N. Smiley, J. A. Warburton and B. M. Morley. *Antarctic Journal of the United States*, Vol. 10, No. 5, 1975, p. 230–31. [Experiments conducted at Amundsen–Scott base to determine where ice crystals are formed in atmosphere and to study sizes, types and relative concentrations of crystals under different conditions.]

[SNOW DRIFTING.] Wind and snow accumulation patterns in the area of Norman Wells, N.W.T. *Canada. Task Force on Northern Oil Development. Environmental-Social Committee, Northern Pipelines. Report* No. 74-38, 1975, [iv], 28 p. [Describes laboratory model tests, using water and sand to simulate movement of wind and snow, and discusses results, presenting recommendations to assist in planning, design and construction of buildings and roads.]

STEINHÄUSSER, H. Die Wasserhaushaltsbilanz des obersten Maltagebietes (Kärnten). *Wetter und Leben*, Jahrg. 27, Ht. 1–2, 1975, p. 77–82. [Hydrology of Malta region, Austria. Water storage calculated and compared with mean monthly amounts of snow precipitation in winter.]

STEPPUHN, H., *and others*. Contributions to runoff from a melting prairie snow patch as traced by oxygen-18, by H. Steppuhn, H. R. Krouse and D. E. L. Erickson. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 28–34. [Melting snow from patch contributed at least 85% of water flowing as surface run-off.]

TABLER, R. D. Predicting profiles of snowdrifts in topographic catchments. *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 87–97. [Reports development and testing of regression model to predict configuration of snow-drifts based on topographic data only.]

TURMANINA, V. I., *and* AKIF'YEVA, K. V. Morfologo-anatomicheskiye osobennosti krivolesiy v svyazi s deyatel'nost'yu snega i lavin [On the morpho-anatomical peculiarities of deformed trees in connection with snow and avalanche activity]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 207–11. [Describes how trees may be affected by avalanches, referring to studies in the U.S.S.R. English summary, p. 211.]

VAN HAVEREN, B. P. Airflow and gas exchange in snow—fact or fiction? *Proceedings of the Western Snow Conference*, 43rd annual meeting, 1975, p. 21–27. [Discusses these concepts and their effect on snow metamorphism and snow-pack evaposublimation from snow hydrologist's point of view.]

WAKABAYASHI, R. Über Schneebruch in den japanischen Wäldern. *Winterbericht des Eidgenössischen Institutes für Schnee- und Lawinenforschung*, Nr. 38, 1975, p. 135–47. [Describes the effect of snow loading on trees in Japan.]

WIESNET, D. R., *and* MATSON, M. *Monthly winter snowline variation in the northern hemisphere from satellite records, 1966–75*. Washington, D.C. U.S. Dept. of Commerce. National Oceanic and Atmospheric Administration. National Environmental Satellite Service, 1975. ii, 21 p. (NOAA Technical Memorandum NESS 74.) [Presents maps and graphs illustrating December snow cover for this period.]

YASHINA, A. V. Metod otsenki roli snezhnogo pokrova v landshaftnykh svyazyakh [Methods of estimation of the role of snow cover in landscape interrelations]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 24, 1974, p. 200–03. [Winter precipitation is important factor. English summary, p. 203.]

ZEMAN, L. J., *and* SLAYMAKER, H. O. Hydrochemical analysis to discriminate variable runoff source areas in an alpine basin. *Arctic and Alpine Research*, Vol. 7, No. 4, 1975, p. 341–51. [Discriminates variable sources of major ionic constituents to run-off from alpine basin and compares temporal and spatial variations.]

ZUZEL, J. F., *and* COX, L. M. Relative importance of meteorological variables in snowmelt. *Water Resources Research*, Vol. 11, No. 1, 1975, p. 174–76. [Standard error of daily snow melt prediction could be decreased 13% by using vapour pressure, net radiation and wind in predictive equations rather than air temperature alone.]