Journal of Glaciology, Vol. 22, No. 86, 1979

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

[Frost action in soil.] *Proceedings of the international symposium on frost action in soils held at the University of Luleå, Luleå, Sweden, February 16–18 1977.* Luleå, University of Luleå, Division of Soil Mechanics, [1977]. 2 vols.: 215 p.; 119 p. [Vol. 1 contains following articles: J. Aguirre-Puente, M. Fremond and J. M. Menot, "Gel dans les milieux poreux, perméabilité variable et mouvements d'eau dans la partie à température négative", p. 5–28; B. D. Kay, M. I. Sheppard and J. P. G. Loch, "A preliminary comparison of simulated and observed water redistribution in soils freezing under laboratory and field conditions", p. 29–41; P. J. Williams, "Thermodynamic conditions for ice accumulation in freezing soils", p. 42–53; L. S. Keinonen, "A thermodynamic description of the ice lensing process", p. 54–58; S. Takagi, "Segregation-freezing temperature as the cause of suction force", p. 59–66; H. Horiguchi, "Frost heave character in freezing of powder materials", p. 67–75; D. Hill and N. R. Morgenstern, "Influence of load and heat extraction on moisture transfer in freezing soils", p. 76–91; E. Penner and T. Ueda, "The dependence of frost heaving on load application—preliminary results", p. 92–101; Ø. Johansen, "Frost penetration and ice accumulation in soils", p. 102–11; A. R. Jumikis, "The cryogenic system soil-water-temperature", p. 112–20; H. V. Kostetskaya, "Features of freezing of salt brines and soils containing salt brines", p. 121–27; R. W. McGaw, "The periodic structure of New Hampshire silt in open-system freezing", p. 128–36; R. Pusch, "Ice formation in clays with special reference to their microstructural constitution", p. 137–42; A. P. Sinitsyn, "Temperature fields by freezing and thawing of soils with ice nucleus", p. 144–49; J. G. Rabinovitch, "Investigation 'in situ' of soil freezing near heated building", p. 150–56; H. L. Jessberger, "Strength and time-dependent deformation of artificially frozen soil", p. 157–67; H. L. Jessberger, "Factors affecting the frost durability of lime or cement stabilized soils", p. 168–77; R. F. Carlson, "Design construction of a northern chilled gas pipeline stream crossing", p. 178–84; K. N. Burn and R. K. Beach, "Frost heave during winter construction of a building in Ottawa, Canada", p. 185–94; R. S. Nordal, "Frost action and thawing effects at the Vormsund test road", p. 195–205; R. Gandahl, "Frost heaving on roads in relation to freezing index", p. 206–15. Vol. 2 contains lectures and reports: D. M. Anderson, "General aspects of the physical state of water and water movement in frozen soils", p. 2–16; E. Penner, "Fundamental aspects of frost action", p. 17–28; K. Flaate, "Technical/engineering aspects of frost action and thawing", p. 29–30; T. Ueda and E. Penner, "Mechanical analogy of a constant heave rate", p. 57–67; R. D. Miller, "Lens initiation in secondary heaving", p. 68–74; S. Outcalt, "Numerical modelling of the ice lensing processes", p. 75–91; R. L. Berg, K. E. Gartner and G. L. Guymon, "A mathematical model to predict frost heave", p. 92–109; A. R. Jumikis, "Outdoor-laboratory soil freezing experiments", p. 110–19. This volume also includes summaries of comments and discussions compiled by E. Penner and K. Flaate, p. 31–56.]

[Glaciers: dynamics.] Symposium über die Dynamik temperierter Gletscher. Vierte Jahresversammlung der Europäischen Geophysikalischen Gesellschaft. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], 290 p. [Papers presented at symposium on dynamics of temperate glaciers, fourth annual meeting of the European Geophysical Society, held in Munich, Germany, 8–9 September 1977. Listed separately.]

Haszpra, O., *and* Hankó, Z. G., *ed. International Association for Hydraulic Research. Sections for Fluvial Hydraulics and for Ice Problems. Permanent International Association of Navigation Congresses. Section of Inland Navigation. International symposium on river and ice. Budapest, January 15 to 17, 1974, Hungary. Proceedings in eleven volumes.* Budapest, IAHR/PIANC, [1974?]. 11 vols.: xv, 169 p.; [30] p.; 16 p.; 104 p.; 10 p.; 142 p.; 8 p.; 62 p.; [8] p.; 11 p.; [16] p. [Contents include: Vol. 1: A. G. Der[y]ugin, "Analysis of conditions for snow ice formation and estimation of its thickness", p. 69–79; A. N. Chizhov and V. A. Buzin, "Hydrometeorological conditions of spring ice jam formation of the Dniester river and forecast of maximum ice jam heights", p. 81–95; I. Brachtel, "Ice control structures on Slovak rivers", p. 149–53; Vol. 2: I. Dégen, "Water management aspects of flood and ice control in Hungary", [30] p.; Vol. 3: Ö. Starosolszky, "Relationships of fluvial and ice hydraulics", 16 p.; Vol. 4: Ö. Starosolszky, "General trends in river ice research", p. 1–6; M. S. Uzuner and J. F. Kennedy, "The mechanics of river ice jams", p. 7–15; V. M. Khidkikh, V. L. Sinotin and Z. A. Guyenkin, "Kinematics of flow under the ice cover", p. 17–23; Shu-t'ien Li, "Some observations of fluvial and ice hydraulics in the cold climate", p. 33–40; E. Zsilák, "A few problems of ice motion which covers a major part of the water surface, termed saturated motion", p. 41–48; G. Rouvé, H. D. Olbrisch and V. Stottmeister, "Variation of discharge in cross-sections with ice-cover", p. 49–56; K. N. Korzhavin, "Conditions of the ice passage through bridge openings free of jams on Siberian rivers", p. 57–65; W. Majewski, "A study of the thermal balance of the St. Lawrence River in winter regime", p. 75–82; G. D. Ashton, "Entrainment of ice blocks—secondary influences", p. 83–89; S. N. Bulatov, "River debacle as function of stream hydraulic regime and melting ice cover strength", p. 99–104; Vol. 5: M. Kozák, "Interrelations between river training, river canalization, low-head water power development and navigation with special regard to ice control", 10 p.; Vol. 6: M. I. Zhidkikh, "Calculation of parameters of a pneumatic

installation intended for keeping ice-free water surface in the reservoirs of hydraulic projects", p. 1–6; T. Octavian, M. Gabriel, P. Marin, R. Nicolae and C. Ion, "The ice regime on the Danube river in the Iron Gates zone", p. 7–16; A. I. Pekhovitch and I. N. Shatalina, "On forecasting and control of ice conditions in shiplifts", p. 17–25; Ya. L. Gotlib and I. N. Sokolov, "Control of ice conditions downstream from hydraulic power plants with reference to navigation problems", p. 27–32; P. Rozsnyói, "Activity for the prevention of ice damage in Hungary", p. 41–48; S. P. Chee, "Hydraulics of river morphology for flow with an ice cover", p. 65–71; S. P. Chee, "Ice regimen and channel constriction on river bed geometry", p. 73–79; V. Matoušek, "Safeguarding winter operation of a pumping station on the river Ohře", p. 81–89; L. Doležal, I. Grund and A. Sikora, "The object and some results of hydraulic research on winter regime in Czechoslovak navigable rivers", p. 91–98; D. F. Dickins and R. O. Ramseier, "Studies on the extension of winter navigation in the St. Lawrence River", p. 99–107; S. M. Aleynikov, V. A. Koren'kov and G. A. Morozov, "Ice-cutting operations in river ice control", p. 109–14; S. Hanagud and J. I. Craig, "Use of acoustic emission in forecasting ice breakup and ice jams", p. 115–22; J. Szenti and I. Zsuffa, "Objective ice observation along the southern section of the river Danube in Hungary and their practical use in ice control", p. 123–35; G. Bálint, "Long range forecast of ice-effects on the middle currents of the Danube river", p. 137–42; Vol. 7: I. Mátrai, "Effects of runoff regulation", 8 p.; Vol. 8: C. Kray, "Discussion of ship channels' layout for consideration of improving their design for better ice flow", p. 1–8; K. I. Rossinskiy and A. A. Kondratskaya, "Effect of run-off control on ice regime of rivers and terms of navigation", p. 25–32; A. Stančíková and J. Szolgay, "Forecasting of ice phenomena on the Danube", p. 33–39; G. Tsang, "Ice piling on lakeshores: with special references to the occurrences on Lake Simcoe in the spring of 1973", p. 41–56; O. Györke, "Ice problems in lakes and in large impoundment reservoirs on canalized rivers", p. 57–62; Vol. 9: H. Simmler, "Some aspects of the ice formation in river reservoirs", [8] p.; Vol. 10: J. Szenti, "On the activity of the lower Danube water authority in the Baja study tour region", 11 p.; Vol. 11: L. Honfi, "Hungarian icebreaker fleet", [16] p.]

Husseiny, A. A., *ed. Iceberg utilization. Proceedings of the first International Conference and Workshops on Iceberg Utilization for Fresh Water Production, Weather Modification and Other Applications held at Iowa State University, Ames, Iowa, USA, October 2–6, 1977*. New York, etc., Pergamon Press, [c1978]. xix, 760 p. [Contents include: S. Galal, "The challenges of iceberg utilization", p. 8–10; L. Ponte, "Alien ice: an evaluation of some subsidiary effects and concomitant problems in iceberg utilization", p. 11–19; J. J. Kelley, "Icebergs—a natural resource", p. 20–24; R. C. Kollmeyer, "West Greenland glaciers: iceberg sources", p. 25–28; J. L. Hult, "The global role of Antarctic iceberg exploitation", p. 29–31; H. Bader, "A critical look at the iceberg utilization project", p. 34–44; W. F. Weeks and M. Mellor, "Some elements of iceberg technology", p. 45–98; C. W. M. Swithinbank, "Remote sensing of iceberg thickness", p. 100–07; R. P. Moore, "Utility of microwave radiometers for the identification and location of icebergs", p. 108–22; E. A. O'Lenic, "U.S. Navy global ice analysis and forecasting", p. 123–30; A. Kovacs, "Iceberg thickness and crack detection", p. 131–45; I. A. El Kassas, "Potential application of remote sensing in locating and tracking of Antarctic icebergs", p. 146–57; G. Holdsworth, "Some mechanisms for the calving of icebergs", p. 160–75; R. A. Smith, "Iceberg cleaving and fracture mechanics—a preliminary survey", p. 176–90; Y. Basmaci, "Strength of icebergs during transport", p. 191–98; R. Stolfi [and 6 others], "Ice moving in sea water", p. 199–219; V. I. Morgan and W. F. Budd, "The distribution, movement and melt rates of Antarctic icebergs", p. 220–28; O. M. Griffin, "Heat, mass and momentum transfer effects on the ablation of icebergs in seawater", p. 229–44; E. G. Josberger, "A laboratory and field study of iceberg deterioration", p. 245–64; B. P. Sukhov, "Measurement of iceberg draft", p. 265–75; J.-C. Tatinclaux and J. F. Kennedy, "Ripple formation at ice-flow interfaces: potential effects on iceberg transport", p. 276–82; D. Girard, "Underwater inspection of icebergs", p. 283–89; G. Murphy, "Small scale modeling of iceberg transport", p. 292–300; M. Al-Faisal and S. Ismail, "Feasibility of using paddle-wheels for the propulsion of icebergs", p. 301–14; J. E. Chirivella and C. G. Miller, "Hydrodynamics of icebergs in transit", p. 315–33; C. P. Benedict, "A towing concept for small icebergs", p. 334–38; J. G. Job, "High efficiency iceberg propulsion systems", p. 339–49; T. A. Davis, "Osmotic propulsion of icebergs", p. 350–58; A. E. Fuhs [and 7 others], "Self propelled iceberg", p. 359–78; A. A. Bruneau, R. T. Dempster and G. R. Peters, "Iceberg towing for oil rig avoidance", p. 379–88; W. W. Denner, "Environmental factors along an iceberg tow route in the Indian Ocean", p. 389–416; K. C. Frisch and J. E. Kresta, "The use of foam insulation for transport of icebergs", p. 418–22; S. N. Hussain, "Iceberg protection by foamed insulation", p. 423–72; C. B. Cluff, "Use of floating solar collectors in processing iceberg water", p. 474–79; T. A. Kusayer, "The role of iceberg utilization research and development in enhancing the transfer of technology in Saudi Arabia", p. 482–91; S. Ahmed, Hang Youn Cho and A. F. Abdul-Fattah, "Making decisions on iceberg utilization based upon multivariate utility theory: a case study in Saudi Arabia", p. 492–502; J. G. Job, "Yields and energetics in moving unprotected icebergs to southern continents", p. 503–27; J. L. Hult, "A pilot program for exporting Antarctic icebergs", p. 528–35; A. F. Abdul-Fattah, "The role of iceberg utilization in solving the Saudi Arabian water problems", p. 536–55; Y. Basmaci and M. O. Jamjoom, "Delivery of icebergs to Saudi Arabia—an assessment", p. 556–76; W. W. Bishop, Jr., "International law problems of acquisition and transportation of Antarctic icebergs", p. 586–96; J.-P. Chamoux, "Some international implications of iceberg transfer", p. 597–603; S. J. Burton, "Legal/political aspects of Antarctic iceberg utilization", p. 604–15; J. Rosenberg, "An overview of the organizational, management, economic and socio-political aspects of transporting icebergs from Antarctica to the United States", p. 616–22; J. Simpson, "Iceberg utilization: comparison with cloud seeding and potential weather impacts", p. 624–39; C. R. Goldman, "Ecological aspects of iceberg transport from Antarctic waters", p. 642–51; R. P. Hammond, "The application of advanced technology to iceberg utilization", p. 654–56; R. T. Heizer, "Energy and fresh water production from icebergs", p. 657–73; D. M. Roberts, "Icebergs as a heat sink for power generation", p. 674–88; "Summaries of workshops and recommendations", p. 704–30.]

General glaciology

Dyurgerov, M. B., *and* Urumbayev, N. A. Glyatsiologicheskiye issledovaniya Pamirskogo firnogo-ledyanogo plato [Glaciological studies of the Pamir firn-ice plateau]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 30–38. [Presents results of detailed summer survey of snow and firn in central Pamir, 5 400–6 200 m a.s.l. English summary, p. 38.]

Habercom, G. E., *jr., ed. Structural foundations in soils, ice, snow, and permafrost. Vol. 2. 1972–May 1977. A bibliography with abstracts. Search period covered 1972–May 1977*. Springfield, Virginia, National Technical Information Service, 1977. iv, 193 p. [May be obtained from Microinfo Ltd., P.O. Box 3, Alton, Hants, England, quoting reference no. NTIS/PS-77/0535.]

Hobson, G. D., *and* Voyce, J., *comp. Titles and abstracts of scientific papers supported by PCSP. No. 3*. Ottawa, Energy, Mines and Resources Canada. Polar Continental Shelf Project, 1977. 97 p. [Includes sections on geophysics, glaciology, meteorology, and sea-ice research.]

Ishida, T., *ed. Glaciological studies in Mizuho Plateau, east Antarctica, 1969–1975*. Tokyo, National Institute of Polar Research, 1978. [iv], 274 p. (Memoirs of National Institute of Polar Research. Special Issue No. 7.) [Contents include: H. Shimizu, "Outline of the studies of the glaciological research program in Mizuho Plateau, east Antarctica, 1969–1975", p. 1–13; H. Shimizu, A. Yoshimura, R. Naruse and K. Yokoyama, "Morphological feature of the ice sheet in Mizuho Plateau", p. 14–25; K. Yokoyama, "Distribution of surface structures of the ice sheet in Mizuho Plateau", p. 26–36; Y. Abe, A. Yoshimura and R. Naruse, "Gravity anomalies and bedrock relief in Mizuho Plateau", p. 37–43; O. Watanabe, "Distribution of surface features of snow cover in Mizuho Plateau", p. 44–62; K. Satow [i.e. Satō], "Distribution of 10 m snow temperatures in Mizuho Plateau", p. 63–71; H. Narita, "Controlling factors of drifting snow", p. 81–92; K. Yokoyama, M. Satomi, O. Watanabe and T. Ohata, "Accumulation and ablation at Syowa station", p. 115–24; T. Yamada, F. Okuhira, K. Yokoyama and O. Watanabe, "Distribution of accumulation measured by the snow stake method in Mizuho Plateau", p. 125–39; F. Okuhira and H. Narita, "A study of formation of a surface snow layer", p. 140–53; O. Watanabe, "Stratigraphic studies of the snow cover in Mizuho Plateau", p. 154–81; T. Yamada and O. Watanabe, "Estimation of mass input in the Shirase and the Sôya drainage basins in Mizuho Plateau", p. 182–97; R. Naruse, "Surface flow and strain of the ice sheet measured by a triangulation chain in Mizuho Plateau", p. 198–226; R. Naruse and H. Shimizu, "Flow line of the ice sheet over Mizuho Plateau", p. 227–34; M. Nakawo [i.e. Nakao], Y. Ageta and A. Yoshimura, "Discharge of ice across the Sôya coast", p. 235–54; K. Kato, O. Watanabe and K. Satow [i.e. Satō], "Oxygen isotopic composition of the surface snow in Mizuho Plateau", p. 245–54; M. Murozumi, S. Nakamura and Y. Yoshida, "Chemical constituents in the surface snow in Mizuho Plateau", p. 255–63; H. Shimizu, O. Watanabe, S. Kobayashi, T. Yamada, R. Naruse and Y. Ageta, "Glaciological aspects and mass budget of the ice sheet in Mizuho Plateau", p. 264–74.]

Keller, H. U., *and* Lillie, C. F. Hydrogen and hydroxyl production rates of Comet Tago-Sato-Kosaka (1969 IX). *Astronomy and Astrophysics*, Vol. 62, Nos. 1–2, 1978, p. 143–47. [Results consistent with the assumption that vaporization of ice controlled gas production rate.]

Kravtsova, V. I. Sovremennye vozmozhnosti i ispol'zovaniye kosmicheskoy informatsii v glyatsiologicheskikh tselyakh [Present-day potentialities and use of satellite information in glaciology]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 183–92. [Literature review.]

Kupetskiy, V. N. O napravlennosti izmeneniy morskogo i nazemnogo oledeneniya v rayone Baffinova zaliva [On the trend in changes of sea and land ice cover in the Baffin Bay region]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 73–81. [Relation to cycles of solar activity.]

Nishio, F. *Glaciological survey in 1976–1977*. Tokyo, National Institute of Polar Research, 1978. [i], 123 p. (Japanese Antarctic Research Expedition. JARE Data Reports, No. 44 (Glaciology).) [Presents data obtained by over-snow traverse party from Syowa station to Mizuho camp, and the glaciological survey at Mizuho camp of the 17th Japanese Antarctic Research Expedition.]

Timofeyeva, N. A. Masshtabnyy ryad Atlasa snezhno-ledovykh resursov mira [Scale series used in the world atlas of snow and ice resources]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 105–10. [Considers scales used in compilation of this atlas. English summary, p. 110.]

Voytkovskiy, K. F., *ed. Merzlyye porody i snezhnyy pokrov* [*Frozen ground and snow cover*]. Moscow, "Nauka", 1977. 188 p. [Articles on permafrost, snow cover, and avalanches in U.S.S.R.]

Glaciological instruments and methods

Aburakawa, H. Yūsetsu netsuryōkei [A calorimeter for measuring snow melt]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 157–66. [Describes instrument whereby total heat can be measured directly on snow surface. English summary, p. 166.]

Antonova, S. Yu., *and others*. Vozmozhnosti ispol'zovaniya melkomasshtabnykh kosmicheskikh snimkov dlya izucheniya dinamiki lednikov [On the possibilities of using small-scale space images for the study of glacier dynamics]. [By] S. Yu. Antonova, L. V. Desinov, V. M. Kotlyakov, V. M. Mikhaylov, V. F. Suslov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 146–60. [Compares studies on glaciers of the Pamir, and concludes combination of air and satellite photography is best for investigations, especially of surging glaciers. English summary, p. 160.]

Bogdanova, E. G. Metodika rascheta doli osadkov raznykh vidov (tverdykh, zhidkikh i smeshannykh) v gornykh usloviyakh [Methods of calculating the amount of different kinds of precipitations (solid, liquid and mixed) under mountain conditions]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 126–29. [Based on data relating to mean monthly temperature and altitude of weather station. English summary, p. 129.]

Cook, B. J. A snow index using 200 mb warm advection. *NOAA Technical Memorandum* NWS SR-93, 1977, ii, 14 p. [Simple forecasting technique. Initial estimate made from calculation using 200 mbar chart; adjustment made based on advection at 700 mb.]

Fritzsche, W., *and* Osterer, F. Elektronische Messungen mit Puls-Echo in der Glaziologie. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 275–83. [Discusses development of electronic instruments for snow and ice measurements, such as measuring depth, investigating firn layer, and detecting crevasses. Also used in searching for avalanche victims.]

Fukuda, M., *and* Yahaga, H. Dojō suibunkei no shisaku [Development of a soil moisture meter]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 325–27.

Garelik, I. S., *and* Selifonova, D. S. Analiticheskiy metod opredeleniya vysoty snegovoy linii v gorakh po kosmicheskim snimkam [Analytical method of determining the height of the snow-line in mountains according to satellite images]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 135–38. [English summary, p. 138.]

Grakovich, V. F., *and* Kalmykova, O. A. Paket programm statistocheskoy obrabotki glyatsiologicheskikh dannykh [Computer programmes for processing glaciological data]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 212–20. [English summary, p. 219–20.]

Holyer, I. J. J., *and others. Laser ice profile analysis using interactive graphics, by I. J. J. Holyer, P. Wadhams, R. T. Lowry.* Cambridge, Scott Polar Research Institute. Sea Ice Group, 1977. ii l., 26 p. (Scott Polar Research Institute Technical Report 77-1.) [System developed for correction and reduction of airborne laser profiles of sea ice.]

Konovalov, V. G. Metodika i tekhnika izmereniy snezhnogo pokrova dlya gidrologicheskikh tseley [Methods of measuring snow cover for hydrological purposes]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 235–55. [Review. English summary, p. 255.]

Kuroiwa, D. Denpa to yuki—kobore-banashi [Electromagnetic waves and snow—an essay]. *Seppyō*, Vol. 39, No. 4, 1977, p. 226–29. [Reviews principles of radio echo-sounding as means of studying snow and ice.]

Legenkov, A. P. Sposob chislennogo opredeleniya napryazheniy i deformatsiy, voznikayushchikh v pripaye pod deystviyem kasatel'nykh napryazheniy sil vetra i techeniy [A method of calculating stress and deformation in fast ice under the action of wind force and currents]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 338, 1977, p. 95–108.

Lile, R. C. A new instrument for the rapid crystallographic analysis of ice thin sections. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 267–73. [Describes multiple-axis photometer, suitable for field use.]

Nakamura, H. Shimo no seizōseichi "shimo bako" no sakusei [Fabrication of "frost box" apparatus for large-scale production of frost]. *Seppyō*, Vol. 40, No. 1, 1978, p. 31–36. [Frost produced as substitute for snow for use in laboratory experiments. Two types of apparatus described, producing 3.5 and 12.5 kg per day, respectively, according to density. English summary, p. 36.]

Schmidt, R. A. A system that measures blowing snow. *U.S. Dept. of Agriculture. Forest Service. Research Paper* RM-194, 1977, 80 p. [Describes snow particle counter, also system that monitors visual range in blowing snow. Includes all design and test data, shop drawings for fabrication of sensor, and service manual for monitor.]

Sheaffer, J. D., *and others*. Determination of silver in precipitation by furnace atomic absorption spectroscopy, [by] J. D. Sheaffer and G. Mulvey, R. K. Skogerboe. *Analytical Chemistry*, Vol. 50, No. 9, 1978, p. 1239–42. [Procedure for determining silver in snowfall described and used to show significant increase 100 km downwind of seeding locations.]

Young, G. T., *and* Arnold, K. C. Orthophotomaps of glaciers; an evaluation of an automated method applied to Peyto Glacier, Alberta. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 99–110. [Describes testing of Gestalt system of glacier mapping. Accurate results obtained except within firn area.]

Physics of ice

Alekseyev, B. F., *and* Fedin, S. G. Kinetika razdeleniya atomarnykh protiya i deyteriya v fotoobluchennykh sil'nokislotnykh l'dakh (po dannym elektronnogo paramagnitnogo rezonansa) [Kinetics of the separation of atomic protium and deuterium in photo-irradiated strong acid ices (based on electron paramagnetic resonance data)]. *Zhurnal Fizicheskoy Khimii*, Tom 52, Vyp. 5, 1978, p. 1333–34. [English translation in *Russian Journal of Physical Chemistry*, Vol. 52, No. 5, 1978, p. 767–70.]

Baker, R. W. The influence of ice-crystal size and dispersed-solid inclusions on the creep of polycrystalline ice. *Dissertation Abstracts International*, B, Vol. 38, No. 10, p. 4688-B. [Laboratory tests and field measurements on Barnes Ice Cap show optimum grain size for creep resistance at *c.* 1 mn, and increasing creep activation energy with increasing volume fraction of inclusions. Abstract of Ph.D. thesis, University of Minnesota, 1977. University Microfilms order no. 78 02631.]

Bantysh, L. A. Osobennosti fazovykh perekhodov voda–led i voda–par pri deystvii postoyannogo magnitnogo polya [Features of the water–ice and water–steam phase transitions under the action of a constant magnetic field]. *Elektronnaya Obrabotka Materialov*, 1977, No. 5, p. 63–64. [Difference in kinetics of phase changes when magnetic field is applied.]

Bilgram, J. H., *and others*. Fluctuations of the ice–water interface during solidification, [by] J. H. Bilgram, H. Güttinger and W. Känzig. *Physical Review Letters*, Vol. 40, No. 21, 1978, p. 1394–97. [Dynamics of freezing process studied using light scattering by fluctuations of the non-equilibrium interface.]

Boutron, P., *and* Kaufmann, A. Metastable states in the system water–ethanol. Existence of a second hydrate; curious properties of both hydrates. *Journal of Chemical Physics*, Vol. 68, No. 11, 1978, p. 5032–41. [X-ray

diffraction and thermal analysis shows formation of structure I clathrate as well as structure II. Crystallization occurs in two steps.]

BUSER, O., *and* AUFDERMAUER, A. N. Electrification by collisions of ice particles on ice or metal targets. (*In* Dolezalek, H., *and* Reiter, R., *ed. Electrical processes in atmospheres. Proceedings of the fifth International Conference on Atmospheric Electricity held at Garmisch-Partenkirchen (Germany), 2–7 September 1974.* Darmstadt, Dietrich Steinkopff Verlag, 1977, p. 294–301.) [Mechanism of charge separation investigated by means of wind tunnel experiments with frozen droplets of 20 μm impinging on various targets.]

FEDERER, B., *and others.* Hailstone trajectories determined from crystallography, deuterium content and radar backscattering, by B. Federer, J. Jouzel and A. Waldvogel. *Pure and Applied Geophysics*, Vol. 116, No. 1, 1978, p. 112–29. [Results of analysis of hailstones in Switzerland.]

GOUGH, S. R. The clathrate hydrate of 2-methylpropanal: dielectric evidence. *Canadian Journal of Chemistry*, Vol. 56, No. 15, 1978, p. 2025–28. [Evidence for a structure II clathrate, and detailed study of mixed hydrate with tetrahydrofuran.]

HAMANO, K., *and others.* Dielectric anisotropy in antiferroelectric copper formate tetrahydrate, [by] K. Hamano, K. Ema and Y. Iwane. *Journal of the Physical Society of Japan*, Vol. 44, No. 3, 1978, p. 933–40. [Explanation of anisotropy in this substance where water molecules obey the ice rules.]

HEARD, W. B. Steady-state convection with melting at a boundary. *Physics of Fluids*, Vol. 20, No. 12, 1977, p. 1993–99. [Theoretical study of convection below melting ice.]

IONESCU, L. G. Entropy of some simple gas–water clathrates. *Revue Roumaine de Chimie*, Tom. 23, No. 1, 1978, p. 45–53. [Describes method for determining entropy on formation of the clathrate hydrates.]

JELLINEK, H. H. G., *and others.* Ice releasing block-copolymer coatings, [by] H. H. G. Jellinek, H. Kachi, S. Kittaka, M. Lee and R. Yokota. *Colloid and Polymer Science*, Vol. 256, No. 6, 1978, p. 544–51. [Use of a series of polydimethylsiloxane-polycarbonate block-copolymers as anti-icing surfaces.]

JOHARI, G. P. Glass transition and secondary relaxations in molecular liquids and crystals. *Annals of the New York Academy of Sciences*, Vol. 279, 1976, p. 117–40. [General review of glass transitions including reference to the hydrogen disorder in ice Ih.]

KAWADA, S. Dielectric anisotropy in ice Ih. *Journal of the Physical Society of Japan*, Vol. 44, No. 6, 1978, p. 1881–86. [Dielectric properties parallel and normal to *c*-axis of ice Ih measured down to −150°C. Anisotropy increases with decreasing temperature.]

KELLER, V. W. Ice crystal growth in a dynamic thermal diffusion chamber. *Dissertation Abstracts International*, B, Vol. 39, No. 1, 1978, p. 269-B–70-B. [Experiments on effect of ventilation velocity on habit of ice crystals grown from the vapour. Abstract of Ph.D. thesis, University of Nevada, Reno, 1977. University Microfilms order no. 78 10013.]

KOSYAKOV, V. I., *and* SHESTAKOV, V. A. Vliyaniye poverkhnosti pereokhlazhdennykh vodyanykh kapel' na kinetiku obrazovaniya ledyanykh zarodyshey [The influence of supercooled water drop surface on the ice nuclei formation kinetics]. *Izvestiya Akademii Nauk SSSR. Fizika Atmosfery i Okeana*, Tom 12, No. 10, 1976, p. 1104–05. [Theory based on homogeneous nucleation shows surface effect negligible in cases of interest for clouds.]

KOZLOVSKAYA, R. T., *and others.* Poverkhnostnaya energiya i fiziko-mekhanicheskiye svoystva l'da [Surface energy and the physico-mechanical properties of ice]. [By] R. T. Kozlovskaya, A. P. Kolosov, V. V. Panov, A. V. Panyushkin, N. A. Sergacheva, Z. I. Shvaynshteyn. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 331, 1976, p. 57–70. [Factors affecting the strength and adhesion of ice are discussed particularly in relation to de-icing.]

KROH, J., *and* POLEVOI, P. Formation of electron-cation pairs in the radiolysis of alkaline ice. *Radiation Physics and Chemistry*, Vol. 11, No. 3, 1978, p. 111–15. [Time dependence of spectrum shape for optical absorption in NaOH-doped ice irradiated at 77 K is explained by this process.]

KROH, J., *and others.* Electron trapping in irradiated NaOH ices. Electrons stabilized at 4 K in shallow traps associated with Na^+ cations, [by] J. Kroh, S. Noda, K. Yoshida and H. Yoshida. *Bulletin of the Chemical Society of Japan*, Vol. 51, No. 7, 1978, p. 1961–64. [Studies on doped ice after γ irradiation at 4 K compared with results of irradiation or annealing at 77 K.]

LAGOURETTE, B., *and others.* Propriétés diélectriques des dispersions de microcristaux de glace: commentaires sur une "mise au point", [par] B. Lagourette, C. Boned et L. Babin. *Journal de Physique*, Tom. 39, No. 6, 1978, p. 718–21. [Reply to comments by C. Lafargue, G. Evrard and S. Bourgeois, ibid., Tom. 38, No. 11, 1977, p. 1473–75 on paper by the authors.]

LEPPÄVUORI, E. K. M. Creep of fresh water ice at high homologous temperatures. *Styrelsen för Vintersjöfartsforskning. Research Report* No. 19, 1976, 162 p.

LINDOW, S. E. Leaf surface bacterial ice nuclei as incitants of frost damage to corn (*Zea mays* L.) and other plants. *Dissertation Abstracts International*, B, Vol. 38, No. 11, 1978, p. 5117-B–18-B. [Bacteria which are active ice nuclei also incite frost injury whereas others do not. Abstract of Ph.D. thesis, University of Wisconsin—Madison, 1977. University Microfilms order no. 77 28262.]

LLIBOUTRY, L. A., *and* RITZ, C. Écoulement permanent d'un fluide visqueux non linéaire (corps de Glen) autour d'une sphère parfaitement lisse. *Annales de Géophysique*, Tom. 34, Fasc. 2, 1978, p. 133–46. [Theoretical study of flow of ice obeying Glen's law around a smooth sphere.]

MACKENZIE, A. P. Non-equilibrium freezing behaviour of aqueous systems. *Philosophical Transactions of the Royal Society of London*, Ser. B, Vol. 278, No. 959, 1977, p. 167–89. [Review of phenomena of supercooling and supersaturation and reduction of growth by viscosity in aqueous solutions. Implications of these for survival of living cells.]

MCKNIGHT, C. V. Dislocations in vapor-grown ice crystals. *Dissertation Abstracts International*, B, Vol. 39, No. 1, 1978, p. 270-B. [Scanning X-ray topography of crystals grown under atmospheric conditions. Abstract of Ph.D. thesis, University of Nevada, Reno, 1977. University Microfilms order no. 78 11018.]

MARTIN, P. F., *and* HUTCHINSON, W. C. A. Melting electrification of single ice particles in simulated free fall. (*In* Dolezalek, H., *and* Reiter, R., *ed. Electrical processes in atmospheres. Proceedings of the fifth International Conference on Atmospheric Electricity held at Garmisch-Partenkirchen (Germany), 2–7 September 1974.* Darmstadt, Dietrich Steinkopff Verlag, 1977, p. 302–08.) [Laboratory measurements of melt-water charge.]

MICHEL, B. A mechanical model of creep of polycrystalline ice. *Canadian Geotechnical Journal*, Vol. 15, No. 2, 1978, p. 155–70. [Presents two-dimensional mechanical model for deformation and creep of polycrystalline ice that takes into account elastic and plastic deformations of each crystal.]

MISHIMA, O., *and* ENDO, S. Melting curve of ice VII. *Journal of Chemical Physics*, Vol. 68, No. 10, 1978, p. 4417–18. [Measurements up to 150 kbar.]

ONSAGER, L., *and others*. Electrical effects during condensation and phase transitions of ice, [by] L. Onsager, D. L. Staebler and S. Mascarenhas. *Journal of Chemical Physics*, Vol. 68, No. 8, 1978, p. 3823–28. [Observations of potentials and currents during growth of amorphous, cubic, and hexagonal ice from the vapour and of later thermally stimulated current on heating. Models proposed.]

POLEVOI, P. S., *and* KROH, J. Spectral characteristics of electron-cation pair in alkaline class [*sic*, i.e. glass] at 77 K. *Bulletin de l'Académie Polonaise des Sciences. Série des Sciences Chimiques*, Tom. 25, No. 12, 1977, p. 993–97. [Results on X-irradiated alkaline ices.]

RIPMEESTER, J. A. NMR line shapes of tunneling methyl groups in enclathrated molecules. *Journal of Chemical Physics*, Vol. 68, No. 4, 1978, p. 1835–40. [Proton n.m.r. line shapes at <5 K reported for various molecules in clathrates in D_2O ice. Shapes can be explained only if distribution of tunnelling frequencies is included.]

ROSS, R. G., *and others*. Effects of H and D order on the thermal conductivity of ice phases, [by] R. G. Ross, P. Andersson and G. Bäckström. *Journal of Chemical Physics*, Vol. 68, No. 9, 1978, p. 3967–72. [Thermal conductivities of nine phases and for H_2O, D_2O and mixtures. Ordered phases have systematically higher conductivities.]

SAINT-GUIRONS, H. Influence de la tenaur en sel sur l'évolution des propriétés diélectriques des microcristaux de glace dopée de NH_4Cl. *Journal of Physics C*, Vol. 11, No. 8, 1978, p. L343–47. [Evolution of activation energy of Debye relaxation with time studied. Relaxation frequency at 273 K is constant with time but rises with salt content up to a saturation value.]

SANTRY, D. P. The effect of unit cell polarity on CNDO/2 crystal calculations. *Chemical Physics Letters*, Vol. 52, No. 3, 1977, p. 500–02. [Possibility of bias towards non-polar structures in this method of calculation investigated using ice lattices. Results suggest the bias exists.]

SATO, E., *and others*. Electron spin resonance study of spin probes in frozen aqueous solutions. II. Ice structure breaking effects of alkali hydroxides, by E. Sato, S. Uematsu and Y. Akahori. *Chemistry Letters* (Tokyo), 1977, No. 9, p. 1051–52. [Electron spin resonance studies of 12-nitroxide stearic acid in frozen aqueous solutions of hydroxides shows rapid movement of this probe suggesting structure-breaking increases with increasing size of the alkali-metal ion.]

SAUNDERS, C. P. R. The interactions of freely-falling ice crystals. (*In* Dolezalek, H., *and* Reiter, R., *ed. Electrical processes in atmospheres. Proceedings of the fifth International Conference on Atmospheric Electricity held at Garmisch-Partenkirchen (Germany), 2–7 September 1974.* Darmstadt, Dietrich Steinkopff Verlag, 1977, p. 310–13.) [Laboratory study of crystals of size 50 μm interacting during free fall in high electric field showed that aggregates of crystals were formed.]

SHŌJI, H., *and* HIGASHI, A. X-ray diffraction topographic studies of Antarctic deep core ice. *Japanese Journal of Applied Physics*, Vol. 17, No. 6, 1978, p. 993–1001. [Results of studies on core from near bottom of ice sheet. Strain fields, dislocation densities, and mosaic structures within the crystals are described.]

TUSIMA [i.e. TSUSHIMA], K. Tankesshōhyō no masatsu ni kansuru kenkyū. I. Kōkyū to kōri no (0001) men oyobi (0110) men no masatsu ni oyobosu kajū, sokudo, ondo no kōka narabi ni masatsu kikō to shite no gyōchaku setsu [Studies of friction on single crystals of ice. I. Load, velocity, and temperature effects on friction between a steel ball and (0001) and (01$\bar{1}$0) of ice, and adhesion theory as a mechanism of friction]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 1–22. [English summary, p. 21–22.]

TUSIMA [i.e. TSUSHIMA], K. Tankesshōhyō no masatsu ni kansuru kenkyū. II. Kassōtai no sunpōkōka oyobi kaimen-sendan kyōdo to hori-okoshi tsuyosa no ondo, sokudo, kajū-izon [Studies of friction on single crystals of ice. II. Size effect of slider and temperature, velocity and load dependencies on interfacial shear strength and ploughing strength]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 23–33. [English summary, p. 32–33.]

TUSIMA [i.e. TSUSHIMA], K. Tankesshōhyō no masatsu ni kansuru kenkyū. III. Kesshō hōi ni yoru dōmasatsu keisū, masatsu-konpuku, hori-okoshi tsuyosa no ihōsei [Studies of friction on single crystals of ice. III. Anisotropies of coefficients of friction, track width and ploughing strength depending on crystallographic orientation]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 35–46. [English summary, p. 46.]

WALRAFEN, G. E., *and* ABEBE, M. Raman studies of the bending and librational bands from water and ice VI to ~12 kbar at 32°C. *Journal of Chemical Physics*, Vol. 68, No. 10, 1978, p. 4694–95. [Results imply little, if any, H-bond breakage.]

WEGENER, W., *and others*. Rotational motion of cyclic ether molecules in clathrate hydrates studied by neutron scattering. I. Quasielastic scattering by ethylene oxide, [by] W. Wegener, J. Vanderhaeghen, S. Hautecler, E. Legrand and L. Van Gerven. *Physica B+C*, Vol. 95, No. 1, 1978, p. 62–70. [Experimental results are described adequately by a model in which only 180° jumps around the molecular polar axis are included.]

WEGENER, W., *and others*. Rotational motion of cyclic ether molecules in clathrate hydrates studied by neutron scattering. II. Inelastic scattering by ethylene oxide, [by] W. Wegener, J. Vanderhaeghen, S. Hautecler and L. Van Gerven. *Physica B+C*, Vol. 95, No. 1, 1978, p. 71–75. [Peaks in the spectrum are given two possible assignments to librations of the guest molecules around their principal axes.]

Land ice. Glaciers. Ice shelves

Alt, B. T. *The energy balance climate of Meighen Ice Cap, N.W.T. Vols. 1 and 2.* Ottawa, Energy, Mines and Resources Canada. Polar Continental Shelf Project, 1975. xviii l., 67 leaves; xv l., 101 leaves.

Alt, B. T. Synoptic climate controls of mass-balance variations on Devon Island ice cap. *Arctic and Alpine Research*, Vol. 10, No. 1, 1978, p. 61–80. [Presents conclusions made from study of 14 years (1961–74) of synoptic weather charts for June to August, together with available meteorological and glaciological data from north-west region of ice cap.]

Ambach, W. Untersuchungen zum Energieumsatz in der Ablationszone des grönländischen Inlandeises: Nachtrag. *Meddelelser om Grønland*, Bd. 187, Nr. 5, 1977, 64 p. (Expédition Glaciologique Internationale au Groenland E.G.I.G. 1957–1960, Vol. 4, No. 5.) [Energy balance in ablation zone of Greenland ice sheet; new calculations of results obtained at Camp 4 in 1959.]

Ambach, W. Untersuchungen zum Energieumsatz in der Akkumulationszone des grönländischen Inlandeises. *Meddelelser om Grønland*, Bd. 187, Nr. 7, 1977, 45 p. (Expédition Glaciologique Internationale au Groenland E.G.I.G. 1967–1968, Vol. 4, No. 7.) [Energy balance in ablation zone of Greenland ice sheet; investigations at Carrefour in 1967.]

Appelquist, H., *and others*. Mercury in the Greenland ice sheet, [by] H. Appelquist, K. O. Jensen, T. Sevel, C. [U.] Hammer. *Nature*, Vol. 273, No. 5664, 1978, p. 657–59. [Hg contents had no increased values either in recent deposits or in deposits of 1783 (year of volcanic eruption of Laki, Iceland). Findings question validity of previous calculations of global Hg turnover.]

Arapov, P. P., *and* Zilitinkevich, S. S. O novom podkhode k otsenke turbulentnogo teplo- i vlagoobmena na lednikakh [On a new approach to the estimation of turbulent heat and moisture exchange on glaciers]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 101–04. [English summary, p. 104.]

Aver'yanov, V. G., *and others*. Oledeneniye Antarktiki i yego rol' v formirovanii klimata i vodnogo rezhima Zemli (problemy glyatsiologicheskikh issledovaniy) [Antarctic ice cover and its role in the formation of the Earth's climate and water regime (problems of glaciological studies)]. [By] V. G. Aver'yanov, Ye. S. Korotkevich, V. M. Kotlyakov. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 97, 1978, p. 6–14.

Bakov, Ye. K., *and* Osmonov, A. Basseyn verkhov'yev r. Sarydzhaza ot ust'ya r. Kuylyu i vyshe [Basin of the upper Sarydzhaza river from the mouth of the Kuylyu river and above]. *Katalog lednikov SSSR [Catalogue of glaciers of the U.S.S.R.]*, Tom 14, Vyp. 2, Chast' 8, 1977. 43 p. [Part of I.H.D. catalogue of glaciers of the U.S.S.R., giving details of what is known of glaciers in this part of Central Asia (Kirgiziya). The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR [Surface water resources of the U.S.S.R.]*.]

Barbat, Yu. P., *and others*. Basseyny pravykh i levykh pritokov verkhov'yev r. Naryna [Basins of the right and left bank tributaries of the upper Naryna river]. [By] Yu. P. Barbat, A. D. Svyatets, L. G. Cherkasov. *Katalog lednikov SSSR [Catalogue of glaciers of the U.S.S.R.]*, Tom 14, Vyp. 1, Chast' 5, 1977. 80 p. [Part of the I.H.D. catalogue of glaciers of the U.S.S.R., giving details of what is known of glaciers in this part of Central Asia (Syrdar'ya). The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR [Surface water resources of the U.S.S.R.]*.]

Barnakova, G. M., *and* Koryakin, V. S. Novaya Zemlya. *Katalog lednikov SSSR. [Catalogue of glaciers of the U.S.S.R.]*, Tom 3, Chast' 2, 1978, 112 p. [Part of I.H.D. catalogue of glaciers of the U.S.S.R., giving details of what is known of glaciers on this island. The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR [Surface water resources of the U.S.S.R.]*.]

Barnakova, G. M., *and* Rototayeva, O. V. Basseyn r. Obikhingou [Basin of the river Obikhingou]. *Katalog lednikov SSSR [Catalogue of glaciers of the U.S.S.R.]*, Tom 14, Vyp. 3, Chast' 5, 1977. 110 p. [Part of I.H.D. catalogue of glaciers of the U.S.S.R., giving details of what is known of glaciers in this area of Central Asia (Amudar'ya). The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR [Surface water resources of the U.S.S.R.]*.]

Barry, R. G., *and* Shartran, M. J. North American glacier photo collection. *E[nvironmental] D[ata] S[ervice]* (U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration), May 1978, p. 4–9. [Collection of air photographs of North American glaciers is major holding of World Data Center-A for Glaciology, Boulder, Colorado.]

Berner, W., *and others*. Dynamic glacier flow model and the production of internal meltwater, by W. Berner, B. Stauffer and H. Oeschger. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 209–17. [Presents model which describes quantitatively processes responsible for depletion of gases in temperate glaciers, thus providing information on processes within glacier, its history, and on conditions at time of ice formation.]

Björnsson, H. Könnun á joklum með rafsegulbylgjum [Radio-echo sounding of temperate glaciers]. *Náttúrufræðingurinn*, Ár 47, Ht. 3–4, 1977, p. 184–94. [Technique applied to Iceland. Presents preliminary map of subglacial topography of Mýrdalsjökull. English summary, p. 193–94.]

Bogorodskiy, V. V., *and* Trepov, G. V. Issledovaniye lednikovogo pokrova Antarktidy metodom radiolokatsionnogo zondirovaniya [Research on the Antarctic ice sheet by radar sounding]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 97, 1978, p. 104–23. [Description of research in measuring thickness, surface movement, structure, and physical characteristics of ice.]

Brooks, R. L., *and others*. Ice sheet topography by satellite altimetry, [by] R. L. Brooks, W. J. Campbell, R. O. Ramseier, H. R. Stanley, H. J. Zwally. *Nature*, Vol. 274, No. 5671, 1978, p. 539–43. [Analysis of data collected from geodynamics experimental ocean satellite (GEOS 3) equipped with radar altimeter permits elevation of ice sheet surface to be determined to accuracy of ± 2 m and surface features of ice flow to be delineated.]

COLLINS, D. N. Hydrology of an Alpine glacier as indicated by the chemical composition of meltwater. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 219–38. [Studies on Gornergletscher, Switzerland.]

DENISOV, L. V., *and others*. Nablyudeniya za podvizhkami lednikov Pamira iz kosmosa [Observations from space of Pamir glacier surges]. [By] L. V. Denisov, V. M. Kotlyakov, V. F. Suslov. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya*, 1978, No. 1, 1978, p. 26–41. [Results of observations made in Soviet Central Asia from 1972 to 1977.]

DENISOV, L. V., *and others*. Podvizhki lednikov na yuzhnom sklone Zaalayskogo khrebta v 1972–1977 godakh [Glacier surges in the south of Zaalayskiy Khrebet in 1972–77]. [By] L. V. Denisov, V. M. Kotlyakov, V. F. Suslov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 205–11. [Soviet Central Asia. English summary, p. 211.]

DILABIO, R. N. W., *and* SHILTS, W. W. Compositional variation of debris in glaciers, Bylot Island, District of Franklin. Project 770033. *Canada. Geological Survey. Paper* 78-1B, 1978, p. 91–94. [Presents results of pilot study on five glaciers and their end moraines.]

DUSHKIN, M. A., *and* REVYAKIN, V. S. Basseyn r. Arguta [Basin of the Arguta river]. *Katalog lednikov SSSR* [*Catalogue of glaciers of the U.S.S.R.*], Tom 15, Vyp. 1, Chast' 5, 1977. 47 p. [Part of I.H.D. catalogue of glaciers of the U.S.S.R., giving details of what is known of glaciers in this area of Central Asia (Gornyy Altay and the upper Irtysh river). The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR* [*Surface water resources of the U.S.S.R.*].]

ELVEN, R. Subglacial plant remains from the Omnsbreen glacier area, south Norway. *Boreas*, Vol. 7, No. 2, 1978, p. 83–89. [Approximately 550 years old, indicating that present Omnsbreen emerged in late Middle Ages.]

GALAKHOV, V. P., *and* REVYAKIN, V. S. Vodnyy balans gorno-lednikovogo basseyna r. Aktru [Water balance of the mountain glacier basin of the Aktru river]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 179–85. [Altay mountain region. Describes method of calculation and presents results. English summary, p. 185.]

GARDNER, J. Wenkchemna Glacier: ablation complex and rock glacier in the Canadian Rocky Mountains. *Canadian Journal of Earth Sciences*, Vol. 15, No. 7, 1978, p. 1200–04. [Glacier represents unusual system composed of high mountain microclimate, snow avalanches, rock falls, and glacier ice, producing debris-covered glacier transitional to rock glacier.]

[GLACIERS: HIMALAYA.] Basic features of the glaciers of the Mt. Jolmo Lungma region, southern part of the Tibet autonomous region, China. *Scientia Sinica*, Vol. 18, No. 1, 1975, p. 106–30. [Deals with features of glaciers of northern slopes of Mt Everest.]

GLAZYRIN, G. YE., *and others*. Issledovaniye yestestvennoy zagryaznennosti yazyka lednika Abramova [Studies of natural contamination of the Abramov glacier tongue]. [By] G. Ye. Glazyrin, V. B. Kislov, A. L. Ogudin. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 94–101. [Kirgizskaya S.S.R. Much of the natural dust is washed away by melt water. Effect of albedo of glacier surface studied. English summary, p. 101.]

GOKHMAN, V. V., *and* CHARUSHNIKOV, YU. A. Nablyudeniya v gorno-lednikovom basseyne r. Bol'shaya Khadata na Polyanom Urale v 1975/76 balansovom godu [Survey of the mountain glacier basin of the Bol'shaya Khadata river in Polyarnyy Ural for the 1975–76 balance year]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 171–74. [Negative balance found. English summary, p. 174.]

GOLODKOVSKAYA, N. A., *and* KOREYSHA, M. M. Basseyn r. Yudomy.—Basseyny levykh pritokov r. Indigirki, berushchikh nachalo na sklonakh khrebta Suntar-Khayata.—Basseyn r. Del'kyu (khrebet Suntar-Khayata) [Basin of the river Yudomy.—Basins of the Indigirka tributaries originating on the slopes of Khrebet Suntar-Khayata.—Basin of the river Del'kyu (Khrebet Suntar-Khayata)]. *Katalog lednikov SSSR* [*Catalogue of glaciers of the U.S.S.R.*], Tom 17, Vyp. 3, Chast' 1; Vyp. 7, Chast' 3; Tom 19, Chast' 3, 1977, 58 p. [Part of I.H.D. catalogue giving details of what is known of glaciers in the Lena-Indigirka region and in the north-east of the U.S.S.R. The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR* [*Surface water resources of the U.S.S.R.*].]

GOLUBEV, G. N., *and* DYURGEROV, M. B. Balans massy lednika Dzhankuat za 1968–1974 gg. [Mass balance of Lednik Dzhankuat from 1968 to 1974]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 189–93. [Presents results for this glacier in the central Caucasus for the period of I.H.D. studies. English summary, p. 193.]

GORDEYCHIK, A. V. Balans massy lednikov Zapadnogo Shpitsbergena v 1975 godu [Mass balance of Spitsbergen glaciers in 1975]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 185–89. [Presents results from observations carried out on Bertilbreen, Bogerbreen and Vøringbreen. English summary, p. 189.]

GORDON, J. E., *and others*. A major rockfall and debris slide on the Lyell Glacier, South Georgia, [by] J. E. Gordon, R. V. Birnie and R. Timmis. *Arctic and Alpine Research*, Vol. 10, No. 1, 1978, p. 49–60. [Describes slide which may affect mass balance of glacier. Occurred 6 September 1975.]

GUDMANDSEN, P., *and* TAAGHOLT, J. Det ukendte land under indlandsisen. *Grønland*, Årg. 25, Nr. 3, 1977, p. 86–90. [Popular account of topography beneath Greenland ice sheet.]

HAMBREY, M. J., *and* MILNES, A. G. Structural geology of an Alpine glacier (Griesgletscher, Valais, Switzerland). *Eclogae Geologicae Helvetiae*, Vol. 70/3, 1977, p. 667–84. [Describes tongue of glacier, treating structural relations as if exposed in stationary rock mass at Earth's surface.]

HERRON, M. M., *and others*. Atmospheric trace elements and sulphate in the Greenland ice sheet, [by] M. M. Herron, C. C. Langway, Jr., H. V. Weiss and J. H. Cragin. *Geochimica et Cosmochimica Acta*, Vol. 41, No. 7, 1977, p. 915–20. [Zn, Pb, and sulphate now being deposited at two to three times the natural rates. No increases in Cd or V. Zn, Pb, Cd, and sulphate are enriched relative to average crystal material at all depths, possibly due to volcanic origin.]

IKEN, A. Variations of surface velocities of some Alpine glaciers measured at intervals of a few hours. Comparison with Arctic glaciers. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 23–35. [Of five glaciers studied, only velocity of Findelen Gletscher has regular diurnal cycle. This and White Glacier, Axel Heiberg Island, Canada, presumably have well-connected cavity systems and would be suitable for study of effects of water pressure on sliding.]

KEYS, J. R., *and others*. Tephra and debris layers in the Skelton névé and Kempe Glacier, south Victoria Land, Antarctica, [by] J. R. Keys, P. W. Anderton and P. R. Kyle. *New Zealand Journal of Geology and Geophysics*, Vol. 20, No. 5, 1977, p. 971–1002. [Describes layers, which were probably erupted from cinder cone between Koettlitz Glacier and Royal Society Range between 1 000 and 10 000 B.P.]

KICK, W. Eisgeschwindigkeitsmessungen an Gletschern Hochasiens. Geschichte—Technik—Ergebnisse. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 7–22. [Reviews briefly early work (1848 and 1856) on ice velocity measurements of Himalayan glaciers, and compares with more recent results (1934 and 1958).]

KISLOV, B. V., *and others*. Temperaturnyy rezhim aktivnogo sloya lednika Abramova [Temperature regime of the active layer of Lednik Abramov]. [By] B. V. Kislov, V. K. Nozdrukhin, F. I. Pertsiger. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 199–204. [Considers thermal regime at different altitudes. English summary, p. 204.]

KNUDSEN, N. T. Drainage of an ice-dammed lake, Okstindan, Nordland, Norway. *Norsk Geografisk Tidsskrift*, Bd. 32, Ht. 2, 1978, p. 55–61. [Observations in 1976 discussed and compared with observations during other jökulhlaups.]

KONDRATYEVA, K. A., *and* VINOGRADOV, O. N. Karty tolshchiny lednikov na ostovakh Sovetskoy Arktiki [Maps showing glacier thickness on islands of the Soviet Arctic]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 164–71. [Presents maps, scale 1 : 2 500 000, showing ice thicknesses of 0–100 m, 100–200 m, 200–300 m, and 300–500 m. Cross-sectional diagrams show glaciers and underlying bedrock. English summary, p. 171.]

KOROTKEVICH, YE. S., *and others*. Rezul'taty izucheniya vertikal'noy struktury lednikovogo pokrova Antarktidy v rayone stantsii Vostok [Results of studies of vertical structure of the Antarctic ice sheet near Vostok station]. [By] Ye. S. Korotkevich, V. N. Petrov, N. I. Barkov, L. I. Sukhonosova, D. N. Dmitriyev, V. G. Portnov. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 97, 1978, p. 135–48. [Observations on borehole deformation, and on chemical and structural properties of core.]

KORYAKIN, V. S. Podgotovka i ispol'zaniye informatsii o prostranstvennykh izmeneniyakh lednikov [The processing and use of data on spatial changes of glaciers]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 171–76. [Discusses data relating to changes in glacier area, used as main index of glacier variations. English summary, p. 176.]

KRAVTSOVA, V. I., *and* LOSEVA, V. G. Karty morfologii lednikov masshtaba 1 : 600 000 v Atlase snezhno-ledovykh resursov mira [Maps of glacier morphology of scale 1 : 600 000 in the world atlas of snow and ice resources]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 111–15. [Details of glaciers are shown according to size of glacier. Considerable detail possible for glaciers over 0.5 km². English summary, p. 115.]

LINK, D. A. The factors controlling the suspended sediment in streams draining currently glaciated basins. *Dissertation Abstracts International*, B, Vol. 38, No. 8, 1978, p. 3601-B. [Data from five valley glaciers in Alaska related to lithology of basin and amount of glacier ice covered by moraine. Abstract of Ph.D. thesis, Northwestern University, 1977. University Microfilms order no. 77-32327.]

MAE, S. The bedrock topography deduced from multiple radar echoes observed in the Mizuho Plateau, east Antarctica. *Nankyoku Shiryō: Antarctic Record*, No. 61, 1978, p. 23–31. [Ice thickness and bedrock topography observed. Probable that sub-ice lake exists.]

MAE, S., *and* NARUSE, R. Possible causes of ice thinning in the Mizuho Plateau. *Nature*, Vol. 272, No. 5660, 1978, p. 291–93. [Deductions based on evidence from survey in November–December 1969 and resurvey in December 1973–January 1974.]

MAIZELS, J. K. Débit des eaux de fonte, charges sedimentaires et taux d'érosion dans le massif du Mont Blanc. *Revue de Géographie Alpine*, Tom. 66, Fasc. 1, 1978, p. 65–91. [Timing and duration of melt season was determined for five glaciers in this area by defining critical minimum flow values of glacial melt waters. Measurement of sediment amounts suggest rates of erosion.]

MARKL, G., *and* WAGNER, H. P. Messungen von Eis- und Firntemperaturen am Hintereisferner (Ötztaler Alpen). *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 261–65. [Presents results of measurements of ice and firn temperatures on Hintereisferner, Austria, from 1972 to 1976.]

MARTIN, S. Analyse et reconstitution de la série des bilans annuels du Glacier de Sarennes, sa relation avec les fluctuations du niveau de trois glaciers du Massif du Mont-Blanc (Bossons, Argentière, Mer de Glace). *Zeitschrift für Gletscherkunde et Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 127–53. [Relates annual (1949–1975) mass balances of Glacier de Sarennes to glacier variations of Bosson, Argentière and Mer de Glace glaciers.]

MEIER, S., *and others*. Geodätisch-glaziologische Arbeiten am Hays-Gletscher, Enderby-Land, während der 17. Sowjetischen Antarktisexpedition 1972, von S. Meier [and 8 others]. *Geodätische und Geophysikalische Veröffentlichungen* (Berlin), Reihe 3, Ht. 37, 1976, 191 p. [Reports investigations on topography and behaviour of Hays Glacier, comparing with Campbell Glacier and with local ice cap near Moledezhnaya station.]

MENSHUTIN, V. M. Balans massy Marukhskogo lednika i izmenchivost' yego sostavlyayushchikh [Mass balance of Lednik Marukh and variability of its components]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 38–44. [Deals with results for nine-year period in western Caucasus. English summary, p. 44.]

MOSER, H., *and* AMBACH, W. Glacial-hydrological investigations in the Oetztal Alps made between 1968 and

1975. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 167–79. [Investigation of passage, types of flow, residence time, and discharge of intraglacial melt water, based on field work at Hintereisferner and Kesselwandferner.]

MÜLLER, F. *Fluctuations of glaciers, 1970–1977. (Vol. III.) A contribution to the International Hydrological Programme. Compiled for the Permanent Service on the Fluctuations of Glaciers of the IUGG–FAGS/ICSU.* Paris, International Commission on Snow and Ice of the International Association of Hydrological Sciences and UNESCO, 1977. x, 269 p.+12 maps. [Continuous work of previous volumes (which covered 1959–65 and 1965–70), with data from polar and non-polar glaciers all over the world and with addenda from earlier years.]

NAKAWO [i.e. NAKAO], M. Shinchō kihō ni chakumoku shita hyōga no kōzō to ryūdō no kenkyū [Studies on structure and flow of a glacier related to elongated bubbles]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 179–219. [Observations on Himalayan glacier show that elongated bubbles occur in debris-covered ice except at terminus. Discusses this phenomenon. English summary, p. 217–19.]

OESCHGER, H., *and others*. First results from Alpine core drilling projects, by H. Oeschger, U. Schotterer, B. Stauffer, W. Haeberli and H. Röthlisberger. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 193–208. [Describes aims and preliminary results of study of firn and ice cores from upper Grenzgletscher and Ewigschneefeld (accumulation area of Grosser Aletschgletscher), Swiss Alps. Also includes appendixes: H. Gäggeler, "^{210}Po (^{210}Pb) dating on the Colle Gnifetti core 1976", p. 204–06; W. Haeberli, "Sahara dust on the Alps—a short review", p. 206–08.]

POGGI, A. Étude comparative du bilan thermique en deux stations du Glacier Ampère (Iles Kerguelen). *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 87–97. [Compares measurements of energy balance at two stations on this glacier.]

REYNAUD, L. Glacier fluctuations in the Mont Blanc area (French Alps). *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 155–66. [Discusses and compares measurements since 1890 on Mer de Glace with those from other neighbouring glaciers.]

SECKEL, H. Das geometrische Nivellement über das grönländische Inlandeis der Gruppe Nivellement A der Internationalen Glaziologischen Grönland Expedition 1967–68. Sommercampagne 1968. *Meddelelser om Grønland*, Bd. 187, Nr. 3, 1977, 86 p. (Expédition Glaciologique Internationale au Groenland E.G.I.G. 1967–1968, Vol. 3, No. 3.) [Geometric levelling on Greenland ice sheet during summer of 1968.]

SECKEL, H. Höhenänderungen im grönländischen Inlandeis zwischen 1959 und 1968. *Meddelelser om Grønland*, Bd. 187, Nr. 4, 1977, 58 p. (Expédition Glaciologique Internationale au Groenland E.G.I.G. 1967–1968, Vol. 3, No. 5.) [Vertical component of ice movement and variation of height of ice sheet along profile measured in 1959 and 1968.]

SHUMSKIY, P. A. *Dynamic glaciology. Translated by U. Radok and V. J. Vinocuroff.* New Delhi, Amerind Publishing Co., 1978. [vi], 161 p. (TT 76-52019.) [Sets out to explain regime, mechanisms, and causes of glacier changes in order to be able to reconstruct and predict them. Translation of Dinamicheskaya glyatsiologiya. *Itogi Nauki. Seriya Geografiya. Gidrologiya Sushi. Glyatsiologiya*, 1968, [pub.] 1969.]

SØNDERGAARD, F., *and* SKOU, N. *Radioglaciology. Side-looking radar imaging and depth soundings of ice at 300 MHz.* Lyngby, Technical University of Denmark. Electromagnetics Institute, 1976. 51 p. (R 170.) [Results from Greenland, 1975.]

SOUCHEZ, R., *and others*. Pressure-melting within a glacier indicated by the chemistry of re-gelation ice, [by] R. Souchez, M. Lemmens, R. Lorrain, J.-L. Tison. *Nature*, Vol. 273, No. 5662, 1978, p. 454–56. [Observations at Tsijiore Nuove glacier, Swiss Alps, suggest pressure melting within basal ice accompanied by melt water squeezing and regelation is active process at base of alpine glaciers and should be considered in calculating sliding of glaciers over rough surfaces.]

THOMAS, R. H. Calving bay dynamics and ice sheet retreat up the St. Lawrence valley system. *Géographie Physique et Quaternaire*, Vol. 31, Nos. 3–4, 1977, p. 347–56. [Reviews dynamics of collapsing ice sheets and applies results to Laurentian Channel.]

TOMAS, J. R. Torden uden lyn i Sydvestgrønland. *Grønland*, Årg. 25, Nr. 3, 1977, p. 91–94. [Personal observations of emptying of ice-dammed lake, Isortuassup Tassia, in south-west Greenland in 1975.]

TSUCHIYA, I. Chōkai-san Kaigata shōhyōga no seppyō kikōgakuteki kenkyū. 2. Keitaisokuryō to ryūdōkansoku [Glacio-climatological study on the Kaigata small glacier, Mt. Chokai. 2. Instrumental surveys of shape and size and measurements of movement]. *Seppyō*, Vol. 40, No. 1, 1978, p. 1–9. [Presents results of further (1975) observations. English summary, p. 9.]

TSUCHIYA, I. Chōkai-san Kaigata shōhyōga no seppyō kikōgakuteki kenkyū. 3. Rimōto senshingu o riyōshita ondo kaisetsu to hyōga to shite no tokushoku [Glacio-climatological study on the Kaigata small glacier, Mt. Chokai. 3. Thermal analysis in combination with remote sensing and some features as a glacier]. *Seppyō*, Vol. 40, No. 1, 1978, p. 10–21. [English summary, p. 20–21.]

TYULINA, T. YU. Sposob otsenki stepeni razvitiya tektonicheskikh struktur na gornykh lednikakh [Methods of evaluating the degree of development of tectonic structures in mountain glaciers]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 220–25. [Evaluation of secondary foliation and shears in glaciers. English summary, p. 225.]

VALLON, M. Bilan de masse et fluctuations recentes du Glacier Ampère (Iles Kerguelen, T.A.A.F.). *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 57–85. [Presents recent results which show thinning of glacier tongue and recession of snout.]

VALLON, M. Topographie sous-glaciaire du Glacier Ampère (Iles Kerguelen, T.A.A.F.). *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 37–55. [Topography of bedrock of glacier obtained by seismic refraction.]

VARNAKOVA, G. M. Osobennosti deshifrirovaniya pokrovnykh i gornykh lednikov v polyarnykh rayonakh (na primere Novoy Zemli) [Peculiarities of interpreting continental and mountain glaciers in polar areas (Novaya

Zemlya)]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 160–64. [Difficulties of distinguishing between different types of ice cover. English summary, p. 164.]

VARTYKYAN, V. G., *and others*. Opyt iskrivleniya skvazhin v usloviyakh Antarktidy [An attempt to bend bore holes in Antarctic conditions]. [By] V. G. Vartykyan, V. I. Kovalenko, B. I. Moiseyev. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 96, 1977, p. 24–35. [Thermal boring at Vostok station.]

VAYKMYAE, R. A., *and others*. Izotopnyye, geokhimicheskiye i stratigraficheskiye issledovaniya na ledorazdele lednikov Grenf'ord i Frit'of (o. Zapadnyy Shpitsbergen) [Isotopic, geochemical and stratigraphic studies on the ice divide of Grønfjordbreane and Fridtjovbreen (Spitsbergen)]. [By] R. A. Vaykmyae, F. G. Gordiyenko, V. S. Zagorodnov, V. I. Mikhalev, Ya.-M. K. Punning, R. A. Rayamyae. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 77–87. [Presents preliminary results of analysis. English summary, p. 87.]

VEYRET, P. Les glaciers du massif du Mont-Blanc (versant nord) de 1974 à 1977. *Revue de Géographie Alpine*, Tom. 66, Fasc. 2, 1978, p. 105–13. [Discusses movements of these glaciers, and whether they are advancing or retreating.]

VINOGRADOV, O. N., *and others*. Nekotoryye kharakteristiki lednikovoy sistemy Kavkaza, metodika i rezul'taty ikh kartografirovaniya [On some properties of the Caucasus glacier system, methods and results of its mapping]. [By] O. N. Vinogradov, G. I. Konovalova, T. V. Psareva. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 115–26. [Uses data from *Katalog lednikov SSSR* [*Catalogue of glaciers of the U.S.S.R.*] for compilation of small-scale maps showing changes and interrelationship of various glaciological indices within the Caucasus. English summary, p. 126.]

WYTTENBACH, A., *and others*. Determination of impurities in ice-cores from the Jungfrau-joch by neutron activation analysis, [by] A. Wyttenbach, R. Rauter, B. Stauffer, U. Schotterer. *Journal of Radioanalytical Chemistry*, Vol. 38, Nos. 1–2, 1977, p. 405–13. [Results of analysis of 4 m core.]

YOUNG, G. J. Relations between mass-balance and meteorological variables on Peyto Glacier, Alberta, 1967/1974. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 111–25. [Mass balance of glacier correlated to meteorological data measured near glacier and at Lake Louise 30 km to south.]

ICEBERGS. SEA, RIVER AND LAKE ICE

AHO, J. Winter oxygen content in relation to water temperature and duration of ice cover in southern Finland. *Annales Zoologici Fennici*, Vol. 15, No. 1, 1978, p. 1–7. [Study of rate of oxygen depletion during winter and its dependence on water temperature and duration of ice cover in two different lake ecosystems during winters from 1962 to 1977.]

ALLEN, A. J. The measurement of surface strain on Drake P-40 artificially thickened sea ice drilling platform. *C-CORE Publication* (Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering) 77-27, 1977, iii, [61] p. (Technical Report No. 77-27.) [Presents results of measuring strain over 1 m length of ice at three sites on drilling platform off coast of Melville Island, N.W.T., Canada.]

ANDERSEN, O. G. N. Primary production associated with sea ice at Godhavn, Disko, west Greenland. *Ophelia*, Vol. 16, No. 2, 1977, p. 205–20. [Primary production, distribution, and survival of unicellular algae living in and adjacent to sea ice.]

ARIKAYNEN, A. I. Priroda mezhgodovoy izmenchivosti ledovitosti Anadyrskogo zaliva vesnoy [The nature of year-to-year changes of the spring ice cover in Anadyrskiy Zaliv]. *Problemy Arktiki i Antarktiki*, Vyp. 51, 1977, p. 49–57. [Bering Sea.]

ARIKAYNEN, A. I. Vozmozhnosti dolgosrochnogo prognozirovaniya sostoyaniya Chukotskoy zapripaynoy polyn'i vesnoy [The possibility of long-term forecasting of the state of the Chukchi flaw polynya]. *Problemy Arktiki i Antarktiki*, Vyp. 51, 1977, p. 44–48. [Ice forecasting in the Chukchi Sea section of the Northern Sea Route.]

ASHTON, G. D. Numerical simulation of air bubbler systems. *Canadian Journal of Civil Engineering*, Vol. 5, No. 2, 1978, p. 231–38. [Suppression of floating ice formation. Uses steady-state analysis already developed, and steps it in time with each new condition determined from results of previous time step.]

AXELSSON, S. Sea ice-75. Radar altimeter results. *Styrelsen för Vintersjöfartsforskning. Forskningsrapport*, Nr. 16 : 7, 1976, 27 p. [See entry under Blomquist, Å., *and others*, ibid., Nr. 16 : 1, 1975, for details of this research programme.]

BARRY, R. G., *and others*. Energy budget studies in relation to fast-ice breakup processes in Davis Strait: climatological overview, by R. G. Barry and J. D. Jacobs with [5 others]. *University of Colorado. Institute of Arctic and Alpine Research. Occasional Paper* No. 26, 1978, [iv], 284 p. [Based on field studies at Broughton Island, N.W.T., Canada, and synoptic climatological analyses.]

BLOMQUIST, Å., *and others*. Sea ice-75. Programme, by Å. Blomquist, C. Pilo and T. Thompson. *Styrelsen för Vintersjöfartsforskning. Forskningsrapport*, Nr. 16 : 1, 1975, 30 p. [First in series of reports evolving from remote sensing experiment carried out in Bay of Bothnia, March 1975.]

BLOMQUIST, Å., *and others*. Sea ice-75. Summary report, by Å. Blomquist, C. Pilo and T. Thompson. *Styrelsen för Vintersjöfartsforskning. Forskningsrapport*, Nr. 16 : 9, 1976, 28 p. [Summarizes results from this remote sensing experiment, based on individual reports describing execution of and results from tests (listed separately).]

BOGORODSKIY, V. V., *and* KHOKHLOV, G. P. Anizotropiya dielektricheskoy pronitsayemosti i udel'nogo pogloshcheniya arkticheskogo dreyfuyushchego l'da v diapazone SVCh [Anisotropy of the dielectric permittivity and specific absorption of Arctic pack ice in the microwave region]. *Zhurnal Tekhnicheskoy Fiziki*, Tom 47, Vyp. 6, 1977, p. 1301–05. [Measurements of dielectric permittivity and specific attenuation in the wavelength range 0.8 to 8 cm for transmission at various angles to the vertical. English translation in *Soviet Physics—Technical Physics*, Vol. 22, No. 6, 1978, p. 747–49.]

Bogorodskiy, V. V., *and* Khokhlov, G. P. Effektivnyye elektricheskiye parametry nachal'nykh vidov morskogo led'yanogo pokrova i nilasa [Effective electrical parameters of the initial forms of sea ice cover and newly formed ice]. *Zhurnal Tekhnicheskoy Fiziki*, Tom 47, Vyp. 6, 1977, p. 1294–300. [English translation in *Soviet Physics—Technical Physics*, Vol. 22, No. 6, 1978, p. 743–46.]

Bogorodskiy, V. V., *and others*. Vozmozhnosti radiogidroakusticheskogo metoda issledovaniya ledovykh protsessov na rekakh [Possibilities of the radiohydroacoustic method for investigating ice processes in rivers]. [By] V. V. Bogorodskiy, V. P. Gavrilo, V. A. Nikitin, K. K. Sukhorukov. *Meteorologiya i Gidrologiya*, 1978, No. 2, p. 60–65. [Method suggested for remote control of break-up and for investigation of ice formation and decay. English summary, p. 65.]

Butt, K. Creep measurement on Arctic ice drilling platforms. *C-CORE News* (Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering), Vol. 3, No. 1, 1978, p. 6–8. [Describes installation of strainmeters on drilling site off Melville Island, N.W.T., Canada.]

Buzuyev, A. Ya., *and* Dubovtsev, V. F. Nekotoryye zakonomernosti raspredeleniya tolshchiny snezhno-ledyanogo pokrova v arkticheskikh moryakh [Some regularities in distribution of snow-ice cover in Arctic seas]. *Meteorologiya i Gidrologiya*, 1978, No. 3, p. 54–60. [Considers snow cover on first-year sea ice. English summary, p. 60.]

Croasdale, K. R., *and* Marcellus, R. W. Ice and wave action on artificial islands in the Beaufort Sea. *Canadian Journal of Civil Engineering*, Vol. 5, No. 1, 1978, p. 98–113. [Discusses ice and sea state conditions in southern Beaufort Sea and how they influence design and construction of artificial islands.]

Drygina, I. A., *and others*. Ob ispol'zovanii komponentnogo analiza pri razrabotke metodiki dolgosrochnogo prognoza ledovitosti arkticheskikh morey [On the use of component analysis in developing a method for long-range forecasting of ice cover of Arctic seas]. [By] I. A. Drygina, E. I. Sarukhanyan, N. P. Smirnov. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 119–42.

Fagerlund, E., *and* Lundholm, G. Sea ice-75. IR-scanner results. *Styrelsen för Vintersjöfartsforskning. Forskningsrapport*, Nr. 16 : 6, 1976, 19 p. [See entry under Blomquist, Å., *and others*, ibid., Nr. 16 : 1, 1975, for details of this research programme.]

Ganong, W. F., *and* Markham, W. E. Action in ice. *WMO Bulletin*, Vol. 27, No. 3, 1978, p. 161–67. [Describes ice information services to marine users with particular reference to North American activities.]

Goblot, R. Diverting icebergs from Labrador oil rigs. *Canadian Geographical Journal*, Vol. 96, No. 3, 1978 p. 52–57. [Discusses aspects of this problem. The only practical solution is towing the iceberg away.]

Gorbunov, Yu. A., *and* Losev, S. M. Dvizheniye l'da v prolivakh [The movement of ice in straits]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 18–23. [Found to be twice as fast as in open sea.]

Gorbunov, Yu. A., *and others*. Dreyf l'da pri nalichii stamukh [Ice drift in the presence of ice hummocks]. [By] Yu. A. Gorbunov, S. M. Losev, L. A. Timokhov. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 338, 1977, p. 79–94. [Based on air photographs of pack ice in seas north of the U.S.S.R.]

Hagman, T., *and others*. Sea ice-75. FLAR, ODER, ship's radar, by T. Hagman, J. Nilsson and Y. Nilsson. *Styrelsen för Vintersjöfartsforskning. Forskningsrapport*, Nr. 16 : 5, 1976, 32 p. [See entry under Blomquist, Å., *and others*, ibid., Nr. 16 : 1, 1975, for details of this research programme.]

Holdsworth, G., *and* Glynn, J. Iceberg calving from floating glaciers by a vibrating mechanism. *Nature*, Vol. 274, No. 5670, 1978, p. 464–66. [Proposes mechanism which, although normally giving rise to weak bending stresses, may, under high incident wave energy, cause calving.]

Hutter, K. On the mechanics of floating ice sheets. *Mitteilungen der Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie an der Eidgenossischen Technischen Hochschule* (Zürich), Nr. 28, 1978, 103 p. [Reviews recent theories developed to obtain better understanding of mechanism governing bearing capacity of floating ice.]

Ishida, T. Bosuniya-wan kaihyō chōsa. V. Kukkyoku shindō no sokutei [Ice study in the Gulf of Bothnia. V. Measurements of flexural waves]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 275–79. [English summary, p. 278–79.]

Ivanov, V. M. Formirovaniye pripaya i molodykh l'dov v period osennezimnego okhlazhdeniya severo-vostochnoy chasti Karskogo morya [Formation of fast ice and young ice in the autumn–winter cooling period in the north-eastern Kara Sea]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 338, 1977, p. 118–24.

Karelin, I. D. K otsenke tepla, idushchego na tayaniye l'da s nizhney i bokovoy poverkhnostey [Estimation of amount of heat causing ice to melt from below and from the side]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 91–97. [Decay of floating ice.]

Karelin, I. D. Turbulentnyy teploobmen mezhdu atmosferoy i podstilayushchey poverkhnost'yu v arkticheskikh moryakh v period tayaniya l'da [Turbulent heat exchange between the atmosphere and underlying surface in Arctic seas in the ice thawing period]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 82–90.

Karelin, V. P. Kvazidvukhletniye kolebaniya v izmeneniyakh ledovitosti arkticheskikh morey [Quasi-biennial fluctuations in variation of the ice cover in Arctic seas]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 103–13. [Related to changes in atmospheric pressure.]

Kawamura, T. Ryūhyōya no hassan to kaiten ni tsuite. II [On divergence and rotation of the ice field off the Okhotsk Sea coast of Hokkaido. II]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 259–66. [Further studies of distribution and movement of ice by means of radar. English summary, p. 266.]

Kawamura, T. Uzumekonda ibutsu ni yoru kaihyō no kōzō henka no kansatsu [Effects of an artificial inclusion on the structure of the surrounding sea ice]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 321–24. [Various objects were allowed to become embedded in sea ice for winter season, and then structure of ice examined.]

Keinonen, A. Measurements of physical characteristics of ridges on April 14 and 15, 1977. *Styrelsen för Vintersjöfartsforskning. Research Report* No. 22, [1977], [20] p. [Ice ridges in northern part of Gulf of Bothnia.]

KEINONEN, A. Presentation of sea ice ridges in general and physical characteristics of Baltic ridges for ship resistance calculations. *Styrelsen för Vintersjöfartsforskning. Research Report* No. 24, [1978], [31] p.

KEINONEN, A. The shape and size of ice ridges in the Baltic according to measurements and calculations. *Styrelsen för Vintersjöfartsforskning. Research Report* No. 17, [1976], [47] p. [Calculates submarine depth profiles of ice ridges on basis of surface elevation profiles, assuming local isostatic balance.]

KHEYSIN, D. YE. K otsenke izmeneniya splochennosti i usiliy torosheniya l'da pri dreyfe [Evaluation of changes in the cohesion and strength of ice ridging during drift]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 24–33.

KHEYSIN, D. YE., *and* BELYAKOV, L. N. Raspredeleniye kolichestva dvizheniya mezhdu l'dom i vodoy pri chiso vetrovom dreyfe l'da [Distribution of momentum between ice and water for ice drift caused by wind alone]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 34–42.

KIVINIEMI, A. Measurements of wave motion in the ice surface. *Suomen Geodeettisen Laitoksen Tiedonantoja*, 1975, 4, 13 p. [Presents results of measurements made off Helsinki (Gulf of Finland) and Pietarsaari (Gulf of Bothnia), and on lake Pyhäjärvi, south-west Finland.]

KOZITSKIY, I. YE. O soprotivlenii l'da srezu [On resistance of ice to shearing]. *Meteorologiya i Gidrologiya*, 1978, No. 3, p. 103–05.

LAMB, H. H., *and* MÖRTH, H. T. Arctic ice, atmospheric circulation and world climate. *Geographical Journal*, Vol. 144, Pt. 1, 1978, p. 1–22. [Examines proposition that behaviour of Arctic ice may provide indicator of world climate, particularly in relation to changes in recent years.]

LAU, G., *and* ROSSITER, J. R. Physical properties of fast ice near Twillingate, Newfoundland, February–March 1977. *C-CORE Publication* (Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering) 78-1, 1978, vii, 95 p. (Technical Report.) [Measurements made at 10 cm depth at several sites in Notre Dame Bay from few weeks before ice formation to break-up.]

LEBEDEV, A. A., *and* URALOV, N. S. Gidrometeorologicheskiye usloviya formirovaniya anomaliy ledovitosti v Devisovom prolive [Hydrometeorological conditions for the formation of ice cover anomalies in Davis Strait]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 53–72. [In Davis Strait and Labrador Sea.]

LEBEDEV, A. A., *and* URALOV, N. S. K voprosu o ledovom balanse Grenlandskogo morya [On ice balance in the Greenland Sea]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 43–52.

LEDREW, B. R., *and* WINSOR, W. D. Additional ground truth measurements—Ship-in-the-Ice, 1977. *C-CORE Publication* (Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering) 78-5, 1978, v, 41 p. (Project SAR '77. Field Data Report No. 15.) [Includes sections on snow features of ice cover and synoptic ice observations.]

LEGEN'KOV, A. P. Podvizhki l'da v Arkticheskom basseyne i vneshniye faktory [Ice shearings in the Arctic basin and external factors]. *Okeanologiya*, Tom 18, No. 2, 1978, p. 239–43. [Calculation of effect of wind and air pressure on sea ice shearing. English summary, p. 243.]

LOSEV, S. M., *and others*. Obrabotka na EVM dannykh izmereniya dreyfa l'da po aerofotosnimkam [Computing ice drift measurements from air photographs]. [By] S. M. Losev, Yu. A. Gorbunov, G. V. Trushina. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 342, 1977, p. 80–89.

MÄÄTTÄNEN, M. On conditions for the rise of self-excited ice-induced autonomous oscillations in slender marine pile structures. *Styrelsen för Vintersjöfartsforskning. Research Report* No. 25, [1978], 98 p. [Presents model analysing three different marine pile structures in Gulf of Bothnia.]

MCGINNIS, D. F., *jr., and* SCHNEIDER, S. R. Monitoring river ice break-up from space. *Photogrammetric Engineering and Remote Sensing*, Vol. 44, No. 1, 1978, p. 57–68. [Ice-covered reaches of Ottawa River observed from NOAA-4 polar orbiting satellite and GOES-1 geostationary satellite.]

MCPHEE, M. G. A simulation of internal oscillation in drifting pack ice. *Dynamics of Atmospheres and Oceans*, Vol. 2, No. 2, 1978, p. 107–22. [Develops simple model for simulating motion of pack ice during periods of energetic inertial oscillation by writing integrated momentum equation for ice and upper ocean driven by surface-wind stress.]

MAKSHTAS, A. P. Teploobmen mezhdu atmosferoy i okeanom v Arkticheskom basseyne cherez l'dy razlichnoy tolshchiny [Heat exchange between atmosphere and ocean in the Arctic basin through ice of various thicknesses]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 347, 1977, p. 68–74.

MANNERS, I. R. The iceberg solution. *Geographical Review*, Vol. 68, No. 2, 1978, p. 224–26. [Reviews developments in interest in icebergs as potential source of fresh water, especially towing Antarctic icebergs to Saudi Arabia.]

MAYKUT, G. A. Energy exchange over young sea ice in the central Arctic. *Journal of Geophysical Research*, Vol. 83, No. C7, 1978, p. 3646–58. [Simple model of heat transport through young sea ice is combined with climatological data on air temperature and incoming radiation in the central Arctic to predict how each component of surface heat balance is affected by changes in ice thickness.]

MEL'NIKOV, I. A., *and* PAVLOV, G. L. Osobennosti raspredeleniya organicheskogo ugleroda v vodakh i l'dakh Arkticheskogo basseyna [Peculiarities of organic carbon distribution in the waters and ice of the Arctic basin]. *Okeanologiya*, Tom 18, No. 2, 1978, p. 248–54. [Relationship to seasonal distribution of zooplankton. English summary, p. 254.]

MORRA, R. H. J., *and* LOOR, G. P. DE. Sea ice-75. Ice detection by SLAR. *Styrelsen för Vintersjöfartsforskning. Forskningsrapport*, Nr. 16 : 3, [1976], 30 p. [See entry under Blomquist, Å., *and others*, ibid., Nr. 16 : 1, 1975, for details of this research programme.]

NIKOLAYEVA, A. YA. Rezul'taty rascheta dreyfa l'da i ispol'zovaniye ikh dlya prognoza mestopolozheniya dreyfuyushchikh stantsiy [Results of ice drift calculations and their use for forecasting the position of drifting

stations]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 5–17. [Based on seasonal distribution of floating ice in the Arctic basin.]

NOHGUCHI [i.e. NŌGUCHI], Y., *and* TABATA, T. Kaihyō no asshuku hakai [Failure of sea ice by compression]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 221–31. [Compares results of normal compression test with those of repeated compression test. English summary, p. 231.]

ONO, N. Rēdā bui ni yoru ryūhyō no ugoki no kansoku [Drift of pack ice observed using radar buoys]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 267–73. [Results of observations off the Okhotsk Sea coast of Hokkaido near Monbetsu. English summary, p. 273.]

PARASHAR, S. Sea ice-75. Analysis of SLAR data. *Styrelsen för Vintersjöfartsforskning. Forskningsrapport*, Nr. 16 : 4, 1976, 46 p. [See entry under Blomquist, Å., *and others*, ibid., Nr. 16 : 1, 1975, for details of this research programme.]

PARKINSON, C. L. *A numerical simulation of the annual cycle of sea ice in the Arctic and Antarctic*. Columbus, Ohio, Ohio State University; Boulder, Colorado, National Center for Atmospheric Research, 1978. xvi, 191 p. (NCAR Cooperative Thesis No. 46.) [Describes construction of numerical model of growth and decay of sea ice in both hemispheres and compares results of model against observations.]

PERHAM, R. E. Ice and ship effects on the St. Marys River ice booms. *Canadian Journal of Civil Engineering*, Vol. 5, No. 2, 1978, p. 222–30. [Discusses operation of these two booms in St. Marys River, connecting Lake Superior to Lake Huron.]

ROBILLARD, L. Suppression de la couverture de glace par un rejet thermique. *Canadian Journal of Civil Engineering*, Vol. 5, No. 1, 1978, p. 53–57. [Discusses prevention of formation of floating ice during winter by thermal discharges and how extent of free surface without ice may be predicted.]

[SEA ICE: ARCTIC.] Arctic sea ice. Parts 1 and 2. *Glaciological Data. Report* GD-2, 1978, ix, 127 p.; v, p. 129–261. [Includes articles: W. F. Weeks, "Sea ice conditions in the Arctic", p. 1–20; W. J. Stringer, "Fast ice terminology", p. 21–23; N. Untersteiner, "The Arctic Ice Dynamics Joint Experiment", p. 25–32; E. P. McClain, "Sea ice observations by NOAA's National Environmental Satellite Service", p. 33–42; E. A. O'Lenic, "U.S. Navy global ice analysis and forecasting", p. 43–46; W. J. Sowden, "Canadian government ice services", p. 47–48; J. E. Walsh, "A data set on northern hemisphere sea ice extent, 1953–76", p. 49–51. Remainder of issue is taken up with a selected bibliography. 1965–77.]

SHIRASAWA, K., *and* TABATA, T. Kaihyō ni oyobosu kaze no ōryoku sokutei ni tsuite. I [Wind stress measurements on sea ice. I]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 241–48. [Compares three methods of measurement. English summary, p. 247–48.]

SINYURIN, YU. N. Torosistost' plavuchego l'da otkrytykh chastyakh Azovskogo morya [Hummocking of floating ice in areas of open water in the Sea of Azov]. *Meteorologiya i Gidrologiya*, 1978, No. 3, p. 99–103.

STEPANOV, S. I. Vliyaniye perenosov vody i tepla na formirovaniye ledovykh usloviy v Karskom more [The influence of water and heat transfer on the formation of ice in the Kara Sea]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 341, 1977, p. 98–102.

STRONG, D. C., *and* WORSFOLD, R. D. Additional ground truth activities and aids to SAR imagery interpretation, Hopedale, Labrador, winter—1977. *C-CORE Publication* (Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering) 77–36, 1978, viii, 68 p. (Project SAR '77. Field Data Report No. 7.) [Studies at field station established on coast of Labrador as part of sea-ice project.]

STRONG, D. C., *and others*. Ice characterization ground truth report, Hopedale, Labrador, winter—1977, by D. C. Strong, R. D. Worsfold, T. A. Dawe, S. Richter, J. Sparkes. *C-CORE Publication* (Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering) 77-35, 1978, x, 163 p. (Project SAR '77. Field Data Report No. 6.) [Includes interpretation of data on physical properties of first-year sea ice and snow cover on sea ice.]

TAKIZAWA, T. Undō kajū ni yoru hyōban no henkei (johō) [Deflection of a floating ice sheet subjected to a moving load (preliminary report)]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 233–40. [Presents results made with snow-mobile, weight 165 kg, on ice of thickness 40 cm, water depth 5 m, distance from shore 300 m. English summary, p. 240.]

TATINCLAUX, J.-C., *and* LEE, C.-L. Initiation of ice jams—a laboratory study. *Canadian Journal of Civil Engineering*, Vol. 5, No. 2, 1978, p. 202–12. [Study of factors influencing formation of ice jams showed significant difference between results obtained with real and plastic ice floes.]

TAYLOR, R. B. The occurrence of grounded ice ridges and shore ice piling along the northern coast of Somerset Island, N.W.T. *Arctic*, Vol. 31, No. 2, 1978, p. 133–49. [Massive piles and ridges were examined between 1973 and 1976. Can occur each summer, but magnitude and site of formation differ.]

TIMOKHOV, L. A. Napryazheniya i deformatsii splochennogo ledyanogo pokrova [Stress and deformation of close pack ice]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 338, 1977, p. 109–17.

TSURIKOV, V. L., *and* TSURIKOVA, A. P. Izucheniye khimii morskikh l'dov (sostoyaniye i zadachi) [Studies on sea ice chemistry (state of the art and objectives)]. *Okeanologiya*, Tom 17, Vyp. 1, 1977, p. 55–64. [Review. English summary, p. 64.]

UDIN, I. Sea ice-75. Ground truth report. *Styrelsen för Vintersjöfartsforskning. Forskningsrapport*, Nr. 16 : 2, 1976, 67 p. [See entry under Blomquist, Å., *and others*, ibid., Nr. 16 : 1, 1975, for details of this research programme.]

UDIN, I., *and* OMSTEDT, A. Sea ice-75. Dynamical report. *Styrelsen för Vintersjöfartsforskning. Forskningsrapport*, Nr. 16 : 8, 1976, 63 p. [See entry under Blomquist, Å., *and others*, ibid., Nr. 16 : 1, 1975, for details of this research programme.]

UDIN, I., *and* ULLERSTIG, A. A numerical model for forecasting the ice motion in the Bay and Sea of Bothnia. *Styrelsen för Vintersjöfartsforskning. Research Report* No. 18, 1977, [40] p. [Describes drift and redistribution of sea ice on the mesoscale. Also published as *Sveriges Meteorologiska och Hydrologiska Institut. Meddelande: Meteorologi och Klimatologi*, Nr. 6, 1977, 40 p.]

VANT, M. R., *and others*. The complex-dielectric constant of sea ice at frequencies in the range 0.1–40 GHz, [by] M. R. Vant, R. O. Ramseier, V. Makios. *Journal of Applied Physics*, Vol. 49, No. 3, Pt. 1, 1978, p. 1264–80. [New measurements 0.1–7.5 GHz and survey of previously published results compared with set of dielectric models.]

VAUDREY, K. D. *Ice engineering—study of related properties of floating sea-ice sheets and summary of elastic and viscoelastic analyses*. Port Hueneme, California, U.S. Navy. Civil Engineering Laboratory, 1977. vi, 79 p. (Technical Report R 860.) [Reviews research on bearing capacity of sea ice.]

WADHAMS, P. C-CORE sails to the Labrador Banks. *C-CORE News* (Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering), Vol. 3, No. 1, 1978, p. 2–4. [Describes (partly in verse) field investigations into interaction between ocean swell and moving pack ice, February–March 1978.]

WAKATSUCHI, M. Kaisui no tōketsu ni yotte okoru entairyū ni kansuru jikken [Experiments on haline convection induced by freezing of sea water]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 249–58. [Presents results of laboratory tests on natural sea water. English summary, p. 257–58.]

WAKATSUCHI, M. Shōwakichi shūhen no kaihyō ni tsuite. I [On sea ice near Showa station, Antarctica. I]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 281–86. [Some general observations on the physical properties of sea ice at this station. English summary, p. 286.]

WAKE, A. Development of a thermodynamic simulation model for the ice regime of Lake Erie. *Dissertation Abstracts International*, B, Vol. 38, No. 9, 1978, p. 4378-B–79-B. [Abstract of Ph.D. thesis, State University of New York at Buffalo, 1977. University Microfilms order no. 77-32712.]

WEDLER, E., *and others*. Shoe Cove satellite data assistance to Canada's cold ocean resource development, by E. Wedler, M. Battikha, L. Brake. *C-CORE Publication* (Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering) 78-3, 1978, [16] p. [Describes and illustrates satellite data received from this new station in Labrador Sea. Applicable to sea-ice distribution and iceberg detection.]

WELANDER, P., *and* BAUER, J. On a differentially heated saltwater-ice system. *Tellus*, Vol. 29, No. 5, 1977, p. 462–69. [Models ice cover on sea and predicts self-sustained oscillations in ice-covered and ice-free regions.]

WINSOR, W. D., *and* LEDREW, B. R. Ice feature characterization—Labrador offshore. *C-CORE Publication* (Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering) 78-4, vi, 50 p. (Project SAR '77. Field Data Report No. 14.) [Study of physical properties and types of pack ice, based on field data collected February 1977.]

GLACIAL GEOLOGY

ASTAKHOV, V. I. Rekonstruktsiya Karskogo tsentra pleystotsenovogo oledeneniya po drevnim morenam Zapadnoy Sibiri [Reconstruction of the Kara centre of Pleistocene glaciation from data on glacial drift in West Siberia]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 60–69.] [Discusses evidence from glacial landforms in West Siberia suggesting existence of ice sheet in Kara Sea region in Pleistocene times. English summary, p. 69.]

BARNETT, D. M. Glacial geomorphology in a sub-polar proglacial lake basin: a process-response model. *Dissertation Abstracts International*, B, Vol. 38, No. 9, 1978, p. 4132-B–33-B. [Processes around Generator Lake, Barnes Ice Cap, Baffin Island, studied and interpreted. Abstract of Ph.D. thesis, University of Western Ontario, 1977.]

BLAKE, W., *jr*. Rock weathering forms above Cory Glacier, Ellesmere Island, District of Franklin. *Canada. Geological Survey. Paper* 78-1B, 1978, p. 207–11. [Describes and discusses tors, relating formation to past and present glaciation.]

CLAGUE, J. J. Mid-Wisconsinan climates of the Pacific northwest. Project 740063. *Canada. Geological Survey. Paper* 78-1B, 1978, p. 95–100. [Relates to lithostratigraphic and biostratigraphic evidence, from which glacial chronology may be deduced.]

CLARK, J. A. Global sea level changes since the last glacial maximum and sea level constraints on the ice sheet disintegration history. *Dissertation Abstracts International*, B, Vol. 38, No. 7, 1978, p. 3099-B. [Numerical model developed and compared with raised-beach data and possibility of using inversion theory to interpret misfits discussed. Abstract of Ph.D. thesis, University of Colorado at Boulder, 1977. University Microfilms order no. 77-29902.]

COWAN, W. R. Trend surface analysis of major late Wisconsinan till sheets, Brantford-Woodstock area, southern Ontario. *Canadian Journal of Earth Sciences*, Vol. 15, No. 6, 1978, p. 1025–36.

CULVER, S. J., *and others*. Infracambrian glaciogenic sediments from Sierra Leone, [by] S. J. Culver, H. R. Williams, P. A. Bull. *Nature*, Vol. 274, No. 5666, 1978, p. 49–51. [Discusses implications.]

DUFORD, J. M., *and* OSBORN, G. D. Holocene and latest Pleistocene cirque glaciations in the Shuswap Highland, British Columbia. *Canadian Journal of Earth Sciences*, Vol. 15, No. 6, 1978, p. 865–73. [Study of Holocene glacial chronology by means of tephrochronology, radiocarbon dating, and lichenometry.]

DYKE, A. S. Glacial history and marine limits on southern Somerset Island, District of Franklin. *Canada. Geological Survey. Paper* 78-1B, 1978, p. 218–23. [Reconstruction of glacial events based on field evidence.]

DYKE, A. S. Indications of neoglacierization on Somerset Island, District of Franklin. *Canada. Geological Survey. Paper* 78-1B, 1978, p. 215–17. [Areas of restricted lichen growth, as well as miniature eskers and melt-water channels, indicate occurrence of Little Ice Age within last 500 years.]

ELÍASSON, S. Molar um Jökulsárhlaup og Ásbyrgi [Comments on the hlaup in the Jökulsá river and Ásbyrgi valley]. *Náttúrufræðingurinn*, Ár 47, Ht. 3–4, 1977, p. 160–79. [Identifies prehistoric jökulhlaup in glacial river in north-east Iceland by means of geological evidence. English summary, p. 179.]

GENES, A. N. Glacial geology of the island Stord, west Norway. *Norsk Geologisk Tidsskrift*, Vol. 38, No. 1, 1978, p. 33–49. [Study undertaken to determine whether island at mouth of Hardangerfjorden was glaciated during last ice advance and to examine its Pleistocene history.]

GILLBERG, G. Drumlins in southern Sweden. *Bulletin of the Geological Institutions of the University of Uppsala*, New Ser., Vol. 6, 1976, p. 125–89. [Describes principal features and discusses how drumlins may have evolved.]

GROSVAL'D, M. G. Posledneye oledeneniye morya Rossa (Antarktika) [On the last glaciation of the Ross Sea (Antarctica)]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 19–30. [Presents synopsis of glacial history of region, based on recent evidence from Transantarctic Mountains, McMurdo Sound, Terra Nova Bay, and Beaufort and Franklin islands. English summary, p. 29–30.]

GROSVAL'D, M. G. Posledniy Yevraziatskiy lednikovyy pokrov [On the last Eurasian ice sheet]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 45–60. [Describes and discusses extent of Quaternary glaciation in northern Europe and Asia. English summary, p. 60.]

HALDORSEN, S. The petrography of tills—a study from Ringsaker, south-eastern Norway. *Norges Geologiske Undersøkelse*, Nr. 336, 36 p. [Concerned principally with composition of till matrix, especially fractions <250 μm.]

HIRVAS, H., *and others*. Raportti malminetsintää palvelevasta maaperätutkimuksesta Pohjois-Suomessa vuosina 1972–1976 [A report on glacial drift investigations for ore prospecting purposes in northern Finland in 1972–76]. [By] H. Hirvas, A. Alfthan, E. Pulkkinen, R. Puranen, R. Tynni. *Geologinen Tutkimuslaitos. Tutkimusraportti*, No. 19, 1977, 54 p. [English summary, p. 51–53.]

KLAJNERT, K. Zanik lodowca Warciańskiego na Wysoczyźnie Skierniewickiej i jej pólnocnym przedpolu [Waning of the Warta ice sheet on the Skierniewice interfluve and its northern foreland]. *Acta Geographica Lodziensia*, Nr. 38, 1978, 149 p. [Stage of Quaternary studied by means of examining origin and structure of glacio-fluvial forms. English summary, p. 133–49.]

MARSHALL, E. W. The geology of the Great Lakes ice cover. *Dissertation Abstracts International*, B, Vol. 38, No. 6, 1977, p. 2587-B–88-B. [Study of lake ice on Great Lakes from geological viewpoint and in relation to winter coastal-zone management. Abstract of Ph.D. thesis, University of Michigan, 1977. University Microfilms order no. 77-26298.]

MATHIEU, R. J. The morphometrics of glacially derived lakes and swamps. *Dissertation Abstracts International*, B, Vol. 38, No. 8, 1978, p. 3609-B. [Significant differences found for features derived by glacial scour and by deposition. Abstract of Ph.D. thesis, University of Georgia, 1977. University Microfilms order no. 77-30490.]

MATISHOV, G. G. Geomorfologiya i nekotoryye osobennosti glyatsial'nogo morfogeneza podvodnoy okrainy Zapadnogo Shpitsbergena [Geomorphology and some morphogenetic glacial peculiarities of the underwater margin of Spitsbergen]. *Okeanologiya*, Tom 18, No. 2, 1978, p. 255–62. [Traces of Quaternary glaciation at depths of 150 to 250 m. English summary, p. 262.]

MINELL, H. Glaciological interpretations of boulder trains for the purpose of prospecting in till. *Sveriges Geologiska Undersokning*, Ser. C, Nr. 743, *Avhandlingar och Uppsatser*, *Årsbok* 72, Nr. 5, 1978, 51 p. [Examines distribution of minerals within tills. Shows relation to behaviour of ice as medium of transport, to bedrock topography, and to prevailing glacial environment before and after deglaciation.]

MYAGKOV, S. M. Granitsa lednikovogo pokrova Zapadnoy Antarktidy v more Rossa v posledniy maksimum oledeneniya [The margin of continuous ice cover of west Antarctica in the Ross Sea during the maximum of the last glaciation]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 69–77. [Reconstructs extent of Quaternary ice sheet, criticizing theories of Hughes, Denton, and others. Suggests surge is not imminent. English summary, p. 77.]

RUFFMAN, A. Labrador Shelf sub-bottom profiles: discussion. *C-CORE News* (Memorial University of Newfoundland. Centre for Cold Ocean Resources Engineering), Vol. 3, No. 1, 1978, p. 5. [Comments on article by A. Gustajtis, ibid., Vol. 2, No. 4, 1977, p. 7–8. Reply by Gustajtis, p. 5.]

SAKS, V. N., *ed.* Posledneye oledeneniye v Nizhnem Priob'ye [The last glaciation in the lower Ob' river region]. [*Trudy*] *Institut Geologii i Geofiziki* (Novosibirsk), Vyp. 346, 1977, 215 p. [Presents results of research in Tyumen'skay Oblast'. English abstract, p. 4.]

SMITH, D. E., *and others*. The late Devensian and Flandrian history of the Teith valley, Scotland, [by] D. E. Smith, K. S. R. Thompson and D. D. Kemp. *Boreas*, Vol. 7, No. 2, 1978, p. 97–107. [Suggests glacial and fluvio-glacial landforms were produced as result of two distinct phases of glaciation, correlated with the last ice sheet in this area and the Loch Lomond readvance.]

ZAMORUYEV, V. V. Chetvertichnoye oledeneniye Allakh-Yun'skogo rayona (Yuzhnoye Verkhoyan'ye) [Quaternary glaciation of the Allakh-Yun region (southern Verkhoyansk region)]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva*, Tom 110, Vyp. 2, 1978, p. 135–42. [In southern Yakutskaya A.S.S.R.]

FROST ACTION ON ROCKS AND SOIL. FROZEN GROUND. PERMAFROST

BROWN, R. J. E. Permafrost investigations on Truelove Lowland. (*In* Bliss, L. C., *ed. Truelove Lowland, Devon Island, Canada: a high Arctic ecosystem.* Edmonton, Alberta, University of Alberta Press, 1977, p. 15–26.) [Describes investigations into permafrost in this area during summer field seasons from 1970 to 1973, the first to be carried out on Devon Island.]

BROWN, ROBENA J., *ed. Permafrost. Part 1. General studies. Part 2. Structural engineering. Citations from the NTIS Data Base. Search period 1964–January 1978.* Springfield, Virginia, National Technical Information Service, 1978. iv, 168 p.; iv, 253 p. [May be obtained from Microinfo Ltd., P.O. Box 3, Alton, Hants, England, quoting reference nos. NTIS/PS-78/0087-88.]

FEL'DMAN, G. M. *Prognoz temperaturnogo rezhima gruntov i razvitiya kriogennykh protsessov* [*Forecasting temperature regime of frozen ground and the development of freezing processes*]. Novosibirsk, "Nauka", 1977. 191 p.

FISCH, W., *sr., and others*. Electrical D.C. resistivity soundings with long profiles on rock glaciers and moraines in the Alps of Switzerland, by W. Fisch, Sr., W. Fisch, Jr., and W. Haeberli. *Zeitschrift für Gletscherkunde und*

Glazialgeologie, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 239–60. [Presents measurements dating from 1952 to 1960, and now published for first time.]

FUKUDA, M. Tōjō katei ni okeru chichū netsuryūryō no henke ni tsuite [Heat flux measurement in freezing soils]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 329–32. [Photographs show changes down to 50 cm.]

JUDGE, A. S. Calculations of permafrost thickness. (*In* Bliss, L. C., *ed. Truelove Lowland, Devon Island, Canada: a high Arctic ecosystem*. Edmonton, Alberta, University of Alberta Press, 1977, p. 26–30.) [Describes method which was then applied to Truelove Lowland. Thickness varied from 210 m at coast to 659 m on adjacent upland.]

KINOSITA [i.e. KINOSHITA], S., *and others*. Reizōsōkō yukashita no tanentō ketsudo ni tsuite [On the perenially frozen ground under a cold store]. [By] S. Kinosita [i.e. Kinoshita], M. Fukuda, M. Inoue, K. Takeda. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 295–306. [Results of detailed laboratory studies of frozen soil removed when store was rebuilt. English summary, p. 305–06.]

KINOSITA [i.e. KINOSHITA], S., *and others*. Tomakomai ni okeru tōjō kansoku (Shōwa 51–52) nen tōki. Shoki chika suii no eikyō [Frost heave in Tomakomai (1976–77). Influence of underground water in the early stages]. [By] S. Kinosita [i.e. Kinoshita], Y. Suzuki, K. Horiguchi, M. Fukuda, M. Inoue, K. Takeda. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 307–19. [Observations of frost heaving in experimental sites. English summary, p. 318–19.]

KONDRAT'YEV, V. G. Novoobrazovaniye mnogoletney merzloty v poyme r. Yenisey (rayon g. Dudinka) [New formation of permafrost on the flood plain of the Yenisey river (Dudinka region)]. *Merzlotnyye Issledovaniya*, Vyp. 16, 1977, p. 73–77. [Taymyrskiy Natsional'nyy Okrug.]

SCHINDLER, C., *and others*. Glaziale Stauchungen in den Niederterrassen-Schottern des Aadorfer Feldes und ihre Deutung, von C. Schindler, H. Röthlisberger und M. Gyger. *Eclogae Geologicae Helvetiae*, Vol. 71/1, 1978, p. 159–74. [Suggests that deformations in gravel and sand deposits of Aadorfer Feld, Switzerland, were caused by glacial compression occurring in permafrost conditions.]

SHPOLYANSKAYA, N. A. *Vechnaya merzlota Zabaykal'ya* [*Permafrost of Zabaykal'ye*]. Moscow, "Nauka", 1978. 131 p.

SVENSSON, H. En fossil dalform på Laholmsslätten. *Svensk Geografisk Årsbok*, Årg. 53, 1977, p. 116–25. [Identifies evidence of late glacial permafrost in valleys in western Sweden.]

TAKEDA, K., *and* SUZUKI, Y. Tsuchi no tōketsuji no mitōketsu donai no suibun idō [Water migration during soil freezing]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 287–93. [Presents results of laboratory tests. English summary, p. 293.]

ZAMOLOTCHIKOVA, S. A. Sezonnoye pucheniye i osadka porod v nizov'yakh r. Yenisey [Seasonal heaving and settling of rocks in the lower reaches of the Yenisey river]. *Merzlotnyye Issledovaniya*, Vyp. 16, 1977, p. 65–72. [Results of permafrost research, 1968–75, in this region.]

ZAMOLOTCHIKOVA, S. A., *and* CHUSHKINA, N. I. Termoeroziya porod v nizov'yakh r. Yenisey [Thermoerosion of rocks in the lower reaches of the Yenisey]. *Merzlotnyye Issledovaniya*, Vyp. 16, 1977, p. 78–84. [In permafrost of Taymyrskiy Natsional'nyy Okrug.]

METEOROLOGICAL AND CLIMATOLOGICAL GLACIOLOGY

GITLIN, S. N. Microprobe analysis of Project DUSTORM hailstone samples. *Journal of Applied Meteorology*, Vol. 17, No. 1, 1978, p. 64–72. [Electron microprobe X-ray analysis used to determine origin and composition of impurities in hailstones in midwestern and central U.S.A.]

GLAZYRIN, G. YE., *and* STUPIN, V. V. Sopostavleniye vysot verkhney granitsy lesa i firnovoy linii v gorakh yugo-zapadnogo Tadzhikistana [Comparison between the tree-line and the firn line in the mountains of south-western Tadzhikistan]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 193–98. [Parallel rises in height confirmed; in arid areas tree and firn lines converge when precipitation increases. English summary, p. 198.]

HOLROYD, E. W., III, *and others*. The practicability of dry ice for on-top seeding of convective clouds, [by] E. W. Holroyd III, A. B. Super and B. A. Silverman. *Journal of Applied Meteorology*, Vol. 17, No. 1, 1978, p. 49–63. [Study of this, including tests, with recommendations for its use.]

ISAAC, G. A., *and others*. Preliminary tests of a cumulus cloud seeding technique, [by] G. A. Isaac, R. S. Schemenauer and C. L. Crozier, A. J. Chisholm, J. I. MacPherson and N. R. Bobbitt, L. B. MacHattie. *Journal of Applied Meteorology*, Vol. 16, No. 9, 1977, p. 949–58. [Tests near Yellowknife, N.W.T., Canada.]

JUDSON, A. Climatological data from the Berthoud Pass area of Colorado. *U.S. Dept of Agriculture. Forest Service. General Technical Report* RM-42, 1977, 94 p. [Presents monthly, daily, and hourly data collected irregularly from 1926 to 1977. Analyses complete year-long data on temperature, precipitation, snow depth, and wind from three sites for period 1963 to 1975.]

KIKUCHI, K. Charging mechanism of snowflakes and soft hail. (*In* Dolezalek, H., *and* Reiter, R., *ed. Electrical processes in atmospheres. Proceedings of the fifth International Conference on Atmospheric Electricity held at Garmisch-Partenkirchen (Germany), 2–7 September 1974*. Darmstadt, Dietrich Steinkopff Verlag, 1977, p. 315–21.) [Based on simultaneous observation of electric field, shape, and charge of falling snow crystal and melted diameter of crystal.]

LINKLETTER, G. O., *and* WARBURTON, J. A. An assessment of NHRE hail suppression seeding technology based on silver analysis. *Journal of Applied Meteorology*, Vol. 16, No. 12, 1977, p. 1332–48. [Analysis of three storms.]

POGGI, A. Contribution à l'étude de la couche limite au voisinage immédiat de la surface du glacier Ampère (Îles Kerguelen). *Annales de Géophysique*, Tom. 32, Fasc. 4, 1976 [pub. 1977], p. 351–72. [Measurements of eddy flux of sensible heat and of radiation fluxes and hence of heat balance over this glacier.]

RIORDAN, A. J. Climatonomic modeling of the dry valleys of Victoria Land, Antarctica, with comparison to snow-covered regions. *Dissertation Abstracts International*, B, Vol. 38, No. 10, 1978, p. 4862-B. [Models suggest that if dry valleys were glacierized there would be minimal summer melting and if Little America V had a darkened surface there would be appreciable summer melting. Abstract of Ph.D. thesis, University of Wisconsin—Madison, 1977. University Microfilms order no. 77-27757.]

VOROB'YEV, B. M. Chislennaya model' statsionarnogo gradovogo protsessa v yestestvennykh usloviyakh i pri zaseve konvektivnogo oblaka ledyanymi chastitsami [Numerical model of a stationary hail process under natural conditions and during seeding of cumulus by ice particles]. *Izvestiya Akademii Nauk SSSR. Fizika Atmosfery i Okeana*, Tom 13, No. 8, 1977, p. 838–44. [Model based on author's theory and kinetics of crystallization predicts that hail nucleus formation can be accelerated by small concentrations of seeding agent. English abstract p. 844.]

SNOW

AKITAYA, E., *and* ENDŌ, Y. Ishikari, Sorachi chihō no sekisetsu chōsa [Regional characteristics of snow cover in Ishikari and Sorachi districts, Hokkaido]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 105–15. [Distinguishes between types of snow at various sites. English summary, p. 114–15.]

AKITAYA, E., *and* ENDŌ, Y. Ishikari, Sorachi, Shiribeshi chihō no sekisetsu chōsa [Regional characteristics of snow cover in Ishikari, Sorachi and Shiribeshi districts, Hokkaido]. *Teion-kagaku: Low Temperature Science*, Ser. A, [Supplement to No.] 35, *Shiryō Shū: Data Report*, 1977, p. 7–11. [Table shows depth, water equivalent, density, Ram hardness, and qualitative description of snow at several sites in these districts during February, March, and April.]

AYZENBERG, M. M., *and* GRISHCHENKO, V. F. Snezhnyy pokrov i snezhnyye laviny na trasse stroitel'stva mezhdunarodnogo gazoprovoda v Ukrainskikh Karpatakh [Snow cover and avalanches along the route of the international gas pipeline being constructed in the Ukrainian Carpathians]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 134–39. [Describes snow hazards and methods of protecting pipeline against avalanches. English summary, p. 139.]

BAUMGARTNER, A., *and* MAYER, H. Die Schneedecke in München von Oktober 1887 bis April 1977. *Meteorologische Rundschau*, Jahrg. 31, Ht. 1, 1978, p. 6–16. [Analysis of daily records for amount of winter snow shows no tendency for harder or milder winters in this period, although strong fluctuations exist.]

BERG, N. H. Prediction of natural snowdrift accumulation on alpine ridge sites. *Dissertation Abstracts International*, B, Vol. 38, No. 7, 1978, p. 3101-B. [Computer simulation model developed and compared with field data on Niwot Ridge, Colorado Front Range. Abstract of Ph.D. thesis, University of Colorado at Boulder, 1977. University Microfilms order no. 77-29899.]

BILYAKOV, K. B., *and others*. Opyt otsenki lavinnoy opasnosti i mery protivolavinnoy zashchity v gornykh rayonakh Sredney Azii [On the evaluation of avalanche hazard and protection from avalanches in the mountains of Central Asia]. [By] K. B. Bilyakov, L. A. Kanayev, V. M. Sezin, G. N. Starygin, V. A. Freyfel'd. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 120–27. [English summary, p. 127.]

BJÖRNSSON, F. Veðurfar og snjólag á Breiðamerkursandi [Weather conditions and snow cover at Breiðamerkursandur]. *Veðrið* (Reykjavík), Ár 20, Ht. 1, 1977, p. 27–30.

BLAGOVESHCHENSKIY, V. P. Vliyaniye morfologii i morfometrii lavinnykh ochagov na nekotoryye kharakteristiki lavinnoy deyatel'nosti [The effect of morphology and morphometry of avalanche starting-points upon some properties of avalanche activity]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 99–106. [English summary, p. 106.]

BOGDANOVA, E. G. Godovoye kolichestvo i godovoy khod tverdykh, smeshannykh i zhidkikh osadkov v gornykh rayonakh Yukhnoy Ameriki [The annual amount and distribution of solid, mixed and liquid precipitation in mountainous areas of South America]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 130–35. [Presents and discusses maps showing solid precipitation. English summary, p. 135.]

BOGDASHEVSKIY, B. I., *and* VOLKOV, B. N. Snegomernaya s"yemka v gorakh Byrranga [Snow surveys of the Byrranga mountains]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 178–79. [Deals with snow accumulation for winter 1971–72 in Taymyrskiy Natsional'nyy Okrug, mentioning specific glaciers. English summary, p. 179.]

BOZHINSKIY, A. N. O kvazikhrupkom razrushenii ledyanoy niti [On quasi-brittle destruction of an ice thread]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 168–71. [Effect of evaporation–condensation process on time of brittle fracture of cylindrical ice thread undergoing creep by constant tension at constant force is considered. English summary, p. 170–71.]

BOZHINSKIY, A. N., *and* SHUROVA, I. YE. Model' struktury zernistogo snega [On a model of granular snow structure]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 159–64. [English summary, p. 164.]

BROWN, R. T. Snow as an accumulator of air pollutants. *Water, Air and Soil Pollution*, Vol. 8, No. 1, 1977, p. 35–39. [Pollutants in snow correlated with lichen survival on trees.]

BURROUGHS, W. J. Snowcover and climate change—seeing the wood for the snow. *Weather*, Vol. 33, No. 7, 1978, p. 282–83. [Letter. Questions whether deforestation in northern mid-latitudes may have caused significant climatic effects due to change in winter albedo.]

CARROLL, T. R. Statistical analysis of the liquid water distribution in a high altitude snowpack. *Dissertation Abstracts International*, B, Vol. 38, No. 7, 1978, p. 3103-B. [Development of computation model based on field data from Red Mountain Pass, Colorado. Abstract of Ph.D. thesis, University of Colorado at Boulder, 1977. University Microfilms order no. 77-29901.]

DANILOVA, YE. M., *and* EGLIT, M. E. Dvizheniye lotkovykh lavin [The motion of trough avalanches]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 65–74. [Considers theory of avalanche motion. English summary, p. 74.]

DEMENT'YEV, A. A., *and* NAUMCHIK, V. I. Zavisimost' stepeni lavinnoy opasnosti Khibinskikh gor ot meteorologicheskikh usloviy [Relationship between the extent of avalanche hazard in the Khibiny mountains and meteorological conditions]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 145–50. [Avalanche hazard related to snowfall and thickness of snow cover. English summary, p. 150.]

DROZDOVSKAYA, N. F., *and others*. Opyt statisticheskogo analiza lavinoobrazuyushchikh faktorov [On the statistical analysis of factors causing avalanches]. [By] N. F. Drozdovskaya, L. A. Kanayev, A. M. Ovchinnikov, A. A. Chirkova. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 106–12. [Avalanche forecasting. English summary, p. 111–12.]

DUSHKIN, V. S., *and others*. K otsenke metelevogo pereraspredeleniya snega v Zapadnom Tyan'-Shane [On estimating the wind distribution of snow in western Tyan' Shan']. [By] V. S. Dushkin, Yu. N. Yemel'yanov, L. A. Kanayev. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 87–94. [Includes studies on snow drifting in this region. English summary, p. 94.]

DYUNIN, A. K., *and others*. Snezhnyye laviny i zanosy na trasse BAM i problemy vybora protivolavinnykh i snegozashchitnykh meropriyatii [Snow avalanches and snow drifts along the Baykal-Amur railway and the problems of counter-avalanche and snow-drift-retardation measures]. [By] A. K. Dyunin, B. A. Anfilof'yev, Yu. A. Marin. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 117–20. [English summary, p. 120.]

DZYUBA, V. V., *and others*. Krony derev'yev kak poverkhnost' skol'zheniya snezhnykh lavin [The crowns of trees as a slide surface for snow avalanches]. [By] V. V. Dzyuba, Ye. A. Zolotarev, G. K. Tushinskiy. *Vestnik Moskovskogo Universiteta. Seriya 5*, 1978, No. 2, p. 92–96. [Suggests how to determine potential places for this occurrence. English summary, p. 96.]

ENDŌ, Y., *and* AKITAYA, E. Sasachi-shamen ni okeru sekisetsu no guraido kikō. I [Glide mechanism of snow cover on a slope covered with bamboo bushes. I]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 91–104. [Based on field observations. English summary, p. 103–04.]

FARHAR, B. C., *and* RINKLE, R. Community response to proposed snowpack augmentation in the Sierra Nevada Mountains. *Journal of Weather Modification* (Fresno, California), Vol. 9, No. 1, 1977, p. 154–92. [Social acceptability of proposal appeared high.]

FÖHN, P. M. B. Representativeness of precipitation measurements in mountainous areas. (*In* Primault, B., *ed. Joint scientific meeting on mountain meteorology and biometeorology, A[merican] M[eteorological] S[ociety], S[chweizerische] G[esellschaft für] B[alneologie und] B[ioklimatologie], S[chweizerische] G[eologische] G[esellschaft]. Interlaken (Switzerland), June 10–14 1976. Proceedings*. Genève, Blanc et Wittwer, 1977, p. 61–77.) [Derives some generally valid conclusions for precipitation measuring techniques in mountainous regions where major part of precipitation is snow.]

FUJINO, K., *and others*. Chakusetsu no hūdō jikken—chakusetsu shūhen no fūsoku bunpu [Experimental studies of snow accretion—distribution of wind speed around snow accretion]. [By] K. Fujino, S. Kobayashi, G. Wakahama. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 147–56. [Describes experimental studies of snow accretion on power lines. English summary, p. 155–56.]

FUKUE, M. Mechanical performance of snow under loading. *Dissertation Abstracts International*, B, Vol. 38, No. 7, 1978, p. 3313-B. [Study of deformation mechanisms of snow under various test conditions and its explanation using adhesion theory. Abstract of Ph.D. thesis, McGill University, Montreal, 1977.]

GOLUBEV, V. N., *and* VOYTKOVSKIY, V. K. Kolichestvennyye kharakteristiki struktury snega [Numerical properties of snow structure]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 164–68. [Describes methods of measuring density, dimensions of grains, distances between their centres, and contact areas. English summary, p. 168.]

GRUDININ, G. V. K voprosu o snegozaderzhivayushchey sposobnosti drevostoyev [On problems of the snow-retardation ability of tree stands]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 51–58. [Compares snow penetration rates in stands of cedar, pine, and spruce. English summary, p. 58.]

HENNING, D. Die Schneeschmelze als Wärmehaushaltsgrösse. (Versuch einer quantitativen Erfassung.) *Wetter und Leben*, Jahrg. 29, Ht. 3, 1977, p. 139–49. [Snow melt measured at Mt. Rainier, Washington, U.S.A., and compared with observations from Austrian Alps.]

HOFER, R., *and* KÜNZI, K. F. Monitoring snow cover over land with passive microwave spectrometry. (*In* Primault, B., *ed. Joint scientific meeting on mountain meteorology and bioclimatology, A[merican] M[eteorological] S[ociety], S[chweizerische] G[esellschaft für] B[alneologie und] B[ioklimatologie], S[chweizerische] G[eologische] G[esellschaft]. Interlaken (Switzerland), June 10–14 1976. Proceedings*. Genève, Blanc et Wittwer, 1977, p. 197–99.) [Abstract. Satellite-mounted radiometers.]

ISAYENKO, E. P. Metodika vybora nekotorykh parametrov protivolavinnykh sooruzheniy i ustanovleniye raschetnoy dal'nosti vybrosa lavin v usloviyakh ogranichennoy informatsii [Methods of selecting some parameters for anti-avalanche constructions and calculation of the length of an avalanche cone when information is limited]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 91–95. [English summary, p. 95.]

ISHIKAWA, M., *and others*. Jinetsu ga sekisetsu chinkōryoku ni oyobosu eikyō [Effect of heat from the ground upon the subsidence of snow]. [By] M. Ishikawa, S. Ono, T. Kawaguchi. *Seppyō*, Vol. 40, No. 1, 1978, p. 47–49. [Describes apparatus for measuring this effect and discusses results obtained.]

ITAGAKI, K. Electric charge current due to drifting snow. (*In* Dolezalek, H., *and* Reiter, R., *ed. Electrical processes in atmospheres. Proceedings of the fifth International Conference on Atmospheric Electricity held at Garmisch-*

Partenkirchen (Germany), 2–7 September 1974. Darmstadt, Dietrich Steinkopff Verlag, 1977, p. 211–16.) [Current of more than 10^{-6} A passed vertical cross-sectional area of 2 m height × 1 m width.]

JACKSON, M. C. Snow cover in Great Britain. *Weather*, Vol. 33, No. 8, 1978, p. 298–309. [Includes number of days with snow lying in a winter, some exceptional winters, and depth of snow cover, based on continuous records in this century.]

KELLER, H. M., *and* STROBEL, T. Predicting snow accumulation in subalpine forest stands. (*In* Primault, B., *ed. Joint scientific meeting on mountain meteorology and biometeorology, A[merican] M[eteorological S[ociety], S[chweizerische] G[esellschaft für] B[alneologie und] B[ioklimatologie], S[chweizerische] G[eologische] G[esellschaft]. Interlaken (Switzerland), June 10–14 1976. Proceedings.* Genève, Blanc et Wittwer, 1977, p. 88–104.) [Using available meteorological parameters as well as site characteristics.]

KERN, H. Zu "Die Zeitpunkte grösster Schneehöhe in den Ostalpenländern" (Wetter und Leben 27, 1975). *Wetter und Leben*, Jahrg. 29, Ht. 4, 1977, p. 261–63. [Comments on article by A. and F. Lauscher, ibid., Jahrg. 27, Ht. 1–2, 1975, p. 26–30.]

KHOMENYUK, YU. V., *and* BLAGOVESHCHENSKIY, V. P. Otsenka dal'nosti vybrosa snezhnykh lavin po morfometricheskim kharakteristikam ikh ochagov metodami opoznavaniya obrazov [Determination of the length of an avalanche cone according to the morphology of its starting-point by means of pattern recognition]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 95–99. [English summary, p. 99.]

KOBAYASHI, D., *and* UEMATSU, T. Yūsetsuki ni okeru kasen genryūiki no suion. III [Stream temperatures during the snow melt period. III]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 167–78. [In observed basin, stream temperatures were higher than expected, from 3 to 5°C. English summary, p. 177–78.]

KOBAYASHI, S. Yuki no nami no hattatsu kikō ni tsuite no ichi kōsai [Consideration of the mechanism of formation of transverse snow waves]. *Seppyō*, Vol. 40, No. 1, 1978, p. 22–30. [Effect of wind on snow formations. English summary, p. 30.]

KOPTEV, A. P., *and* SAKUNOV, G. G. Metodika i rezul'taty issledovaniy radiatsionnykh kharakteristik snezhno-firnogo pokrova [Methods and results of research into radiation characteristics of the snow-firn cover]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 342, 1977, p. 90–96. [Based on research at Mirny station, Antarctica, in 1966.]

KOROLEV, A. I. Ob opredelenii sil stsepleniya i soprotivleniya szhatiyu snezhnogo pokrova [On determining cohesive forces and the resistance to snow cover compression]. *Meteorologiya i Gidrologiya*, 1978, No. 2, p. 72–76. [Concludes snow resistance to compression is considerably higher than the cohesive forces. English summary, p. 76.]

KOZHEVNIKOV, V. S. Nekotoryye osobennosti rascheta osnovnykh parametrov opornykh snegouderzhivayushchikh konstruktsiy [Some features of the calculation of the main parameters of supporting snow control constructions]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 85–91. [Theory behind construction of avalanche defences. English summary, p. 91.]

KRAVTSOVA, V. I. Izucheniye lavin po materialam raznomasshtabnykh aerokosmicheskikh s"yemok (na primere Zapadnogo Altaya) [Study of avalanches on the basis of different scales of air-space surveys (western Altay)]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 30, 1977, p. 138–46. [Evaluates use and accuracy of satellite and air photography for identifying avalanches. English summary, p. 145–46.]

KULIKOVSKIY, A. G., *and* SVESHNIKOVA, YE. I. Model' dlya rascheta dvizheniya pylevoy snezhnoy laviny [Mathematical model for calculating the movement of a powder avalanche]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 74–80. [Theory of powder avalanches. English summary, p. 80.]

LACHAPELLE, E. R., *and* ARMSTRONG, R. L. *Temperature patterns in an alpine snow cover and their influence on snow metamorphism. Technical report.* Boulder, Colorado, University of Colorado. Institute of Arctic and Alpine Research, 1977. iv l., 33 leaves. [Presents results of studies in San Juan Mountains, Colorado, at altitudes between 2 850 and 3 400 m a.s.l.]

MAKSIMOV, N. V., *and others.* Opyt bor'by s lavinnoy opasnost'yu na transtyan'shanskoy avtomagistrali Frunze-Osh [Experiences of dealing with danger from avalanches on the trans-Tyan' Shan' highway, Frunze-Osh]. [By] N. V. Maksimov, Yu. P. Barbat, B. G. Mineyev, P. A. Solodkov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 127–34. [Most important form of protection is by forecasting. Artificial release and fences considered. English summary, p. 134.]

MATSON, M., *and* WIESNET, D. R. Winter snow cover patterns in North America and Eurasia, 1975–76. (*In* Sprigg, W. A., *and* Evans, R., *ed. Proceedings of the NOAA climate diagnostics workshop held at the World Weather Building, Washington, D.C., on November 4–5, 1976.* Washington, D.C., National Oceanic and Atmospheric Administration, 1976, paper 6, [15] p.) [Analyses data from satellite surveys in attempt to relate mean summer snow extent and following mean winter snow extent.]

MIZUNO, Y., *and* WAKAHAMA, G. Shissetsu no fuchaku kyōdo [Adhesive strength of wet snow]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 133–45. [Study of accretion on wires, aluminium, glass, and several kinds of plastics and rubbers. English summary, p. 143–45.]

MÖRTH, H. T. Severe snow drifts over Scotland and southwest Britain. *Climate Monitor* (University of East Anglia. Climatic Research Unit), Vol. 7, No. 1, 1978, p. 23–28. [Describes meteorological events leading to abnormally severe snowfall in northern Scotland in January and in Devon and Cornwall in February 1978.]

MUENCH, H. S., *and* BROWN, H. A. *Measurements of visibility and radar reflectivity during snowstorms in the AFGL mesonet.* Bedford, Mass., Hanscom Air Force Base. Air Force Geophysics Laboratory. Meteorology Division, 1977. 36 p. (AFGL-TR-77-0148. Environmental Research Papers, No. 602.) [Evaluation of radar to observe and predict snow.]

NAKAMURA, H. Katsuraku shita yanbyuki no taiseki keijō [Shape of the snow bank formed under eaves by the slipping of snow from the roof]. *Seppyō*, Vol. 40, No. 1, 1978, p. 37–41. [Mathematical analysis of shape of snow bank. English summary, p. 41.]

NAKATAO [i.e. NAKATŌ], T., *and* MIZUKOSHI, M. Setsugai shisū narabi ni jinkō ni motozuku setsugai taisaku keihino hyōgen [A new snow disaster population index and snow disaster expenditures]. *Seppyō*, Vol. 40, No. 1, 1978, p. 42–46. [Mathematical treatment of snow-disaster data. English summary, p. 46.]

NARITA, H. Sekisetsu no inchōsokudo to henkeikeishiki no kankei. I. Waisokudo 2.6/day–2.5 × 10^2/day de no yuki nohenkei to hadan [Uniaxial tension of snow. I. Deformation and fracture of snow at strain rate of 2.5 to 2.6 × 10^2/day]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 67–75. [Laboratory study. English summary, p. 75.]

NARITA, H. Setsumen no katasa, hisetsukei, ondo ga jifubuki genshō ni oyobusu eikyō [Influence of hardness of snow surface, particle shape of drifting snow, and temperature on drifting snow phenomena]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 77–89. [These factors had a marked effect. English summary, p. 88–89.]

NARUSE, R., *and others*. Kitami-sanchi Uenshiri-dake no sekkei chōsa. II [Glaciological studies of a snow-patch on Mt. Uenshiridake, Hokkaido. II]. [By] R. Naruse, S. Takahashi, T. Okano, Y. Kodama, S. Kohno [i.e. Kōno]. *Teion-kagaku: Low Temperature Science*, Ser. A, [Supplement to No.] 35, *Shiryō Shū: Data Report*, 1977, p. 23–25. [Observations made during summer 1977, continuing earlier work (*Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 34, 1976, p. 147–62).]

NEUWIRTH, F. Abschätzung der mittleren Ströme latenter und fühlbarer Wärme über Schnee. *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. A, Vol. 26, Nos. 2–3, 1977, p. 213–28. [Estimates mean fluxes of latent and sensible heat above snow for different altitudes above sea-level in eastern Alps for single months.]

NIKOL'SKAYA, O. V. Metodika modelirovaniya protsessov obrazovaniya snezhnykh lavin [Methods of simulating processes causing formation of snow avalanches]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 81–85. [Laboratory study. English summary, p. 85.]

OSOKIN, N. I. Tayaniye otdel'nykh snezhnikov i ikh kompleksov v usloviyakh snezhnikovykh landshaftov srednegoriy SSSR [Melting of separate snow-patches and their complexes in conditions of firn field landscapes of the U.S.S.R.]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 45–51. [Based on observations in Polyarnyy Ural, the Crimea, and Kamchatka, and on interpretation of satellite pictures. English summary, p. 51.]

PARUNGO, F. P., *and others*. Snowfall induced by a power plant plume, [by] F. P. Parungo, P. A. Allee, H. K. Weickmann. *Geophysical Research Letters*, Vol. 5, No. 6, 1978, p. 515–17. [Observations at Boulder, Colorado.]

ROZENBERG, L. S. Zakonomernosti sootnosheniya kolichestv snegootlozheniya v lesu i v pole [On the conformity of relations between snow accumulation in forest and field]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 58–64. [Results related to data for snow in sheltered areas. Effect of wind velocity and air temperature considered. Can be used in estimating snow loads on buildings. English summary, p. 64.]

ST. LAWRENCE, W. F. A structural theory for the deformation of snow. *Dissertation Abstracts International*, B, Vol. 38, No. 7, 1978, p. 3277-B–78-B. [Derivation of constitutive equation to describe uniaxial deformation of snow. Abstract of Ph.D. thesis, Montana State University, 1977. University Microfilms order no. 77-29307.]

SCHNEIDER, S., *and* MATSON, M. Satellite observations of snowcover in the Sierra Nevadas during the great California drought. *Remote Sensing of Environment*, Vol. 6, No. 4, 1977, p. 327–34. [Stresses value of images from NOAA satellite for this type of survey. In April 1977, mountain range had less than one-third snow cover present in April 1975.]

SCHWAIGER, L. Wind und Schnee als stochastische Prozesse. *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. A, Vol. 26, Nos. 2–3, 1977, p. 229–39. [Daily altitude of existing snow cover and daily maximum gust of wind are each described as stochastic processes.]

SEVERSKIY, I. V., *and* BLAGOVESHCHENSKIY, V. P. Kartirovaniye kolichestvennykh kharakteristik lavinnoy opasnosti (na primere gor yugo-vostochnogo Kazakhstana) [Mapping of numerical characteristics of danger from avalanches (for example in the mountains of south-east Khazakhstan)]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 139–45. [Deals with mapping areas of potential avalanche danger in mountainous areas. English summary, p. 145.]

ŠAMAJ, F., *and* VALOVIČ, S. Maximaler Wasserwert der Schneedecke in der Slowakei. *Contributions of the Geophysical Institute of the Slovak Academy of Sciences. Series of Meteorology* (Bratislava), Vol. 2, 1978, p. 167–79. [Presents observations on water content of snow at 61 gauging stations in Czechoslovakia for winters 1946–47 to 1971–72.]

SHIMIZU, H., *and others*. Kurobe kyōkoku kōsoku nadare no kenkyū. V. Shōwa 50–51 nen, 51–52 nen tōki [Study of high speed avalanches in Kurobe canyon. V. Winters of 1975–76 and 1976–77]. [By] H. Shimizu, T. Huzioka [i.e. Fujioka], E. Akitaya, H. Narita, M. Nakagawa, K. Kawada. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 117–32. [Three severe avalanches were observed during each winter. English summary, p. 131–32.]

SIGFÚSDÓTTIR, A. B. Rannsóknir á snjóflóðum [Investigations of avalanches]. *Veðrið* (Reykjavík), Ár 20, Ht. 1, 1977, p. 18–20.

SINGER, L., *and* ARMSTRONG, W. D. Fluoride in treated sewage and in rain and snow. *Archives of Environmental Health*, Vol. 32, No. 1, 1977, p. 21–23. [Measurement of fluoride in snow shows marked rise while settled in urban area of Minneapolis–St. Paul.]

STICHLER, W., *and* HERRMANN, A. Variations of isotopes in snow covers as input of temperate glaciers. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 13, Ht. 1–2, 1977 [pub. 1978], p. 181–91. [Discusses difficulties in interpreting these variations, caused chiefly by influence of rain and fractionation due to melting. Based on field work in the Swiss Alps and Bavaria.]

SUDAKOV, P. A., *and* PLEKHANOV, P. A. Vremennaya i prostranstvennaya izmenchivost' maksimal'nykh snegozhapasov v glyatsial'noy zone Zailiyskogo Alatay [Time and spatial variability of maximum snow storage

in the glacial zone of Khrebet Zailiyskiy Alatau]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 179–82. [Soviet Central Asia. English summary, p. 182.]

TRETYAK, P. R. O roli snezhnikov v vysokogornykh landshaftakh Ukrainskikh Karpat [The role of firn in the mountainous landscape of the Carpathian Ukraine]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva*, Tom 110, Vyp. 2, 1978, p. 142–49.

VINOGRADOV, V. N., *and* OSOKIN, N. I. Snezhnikovyye landshafty vulkanicheskikh rayonov Kamchatki [Snow-patch landscapes in volcanic areas of Kamchatka]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 174–78. [English summary, p. 178.]

VLASOV, V. P. Razrabotka modeli protivolavinnykh lesnykh nasazhdeniy (na primere severnogo oklona Zapadnogo Kavkaza) [Development of a model for anti-avalanche forest plantations (for example on the northern slope of the western Caucasus)]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 112–17. [Discusses planting forests in avalanche-prone areas. English summary, p. 117.]

WAGNER, —. Katastrophale Schneefälle im Januar 1978 in den USA. *Wetterkarte des Deutschen Wetterdienstes* (Hamburg), Jahrg. 1978, Nr. 37, 1978, 1 p. [Describes conditions leading to this exceptionally heavy snowfall.]

WEISS, H. V., *and others*. Natural enrichment of elements in snow, [by] H. V. Weiss, M. M. Herron, C. C. Langway, Jr. *Nature*, Vol. 274, No. 5669, 1978, p. 352–53. [Degree of natural enrichment of Hg, As, Sb, Se, and Cu studied in pre-industrial ice deposits from North Slope, Alaska.]

YOSIDA, Z. [i.e. YOSHIDA, J.] Kaze ga yūki suru setsunai kiryū [Air flow induced in snow cover by wind blowing over the surface]. *Teion-kagaku: Low Temperature Science*, Ser. A, [No.] 35, 1977, p. 47–65. [Theoretical study. English summary, p. 62–65.]

ZALIKHANOV, M. CH., *and others*. Rezhim protsessov lavinoobrazovaniya na Bol'shom Kavkaze [Regime of the processes of avalanche formation in the Caucasus mountains]. [By] M. Ch. Zalikhanov, V. R. Bolov, M. M. Bagov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 31, 1977, p. 151–53. [In this area, 55% of avalanches occur between 2 000 and 4 000 m altitude, and mainly during snow-falls and storms. Seasonal distribution determined. English summary, p. 153.]