

## 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 Geographical 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

- [INTERNATIONAL HYDROLOGICAL DECADE.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, September 1972. A contribution to the International Hydrological Decade.* Paris, UNESCO; Geneva, WMO; Budapest, IAHS, 1973. 2 vols.: [xvi], 827 p.; [xii], 829-1484 p. [For details of individual papers see elsewhere in this list.]
- SANTEFORD, H. S., and SMITH, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources: an interdisciplinary symposium organized by the Work Group on Snow and Ice, the Work Group on Remote Sensing, and the Work Group on Nuclear Techniques of the U.S. National Committee for the International Hydrological Decade. . . . Monterey, California, December 2-6, 1973. . . .* Washington, D.C., National Academy of Sciences, 1974. x, 789 p. [For details of individual papers see elsewhere in this list.]

### GENERAL GLACIOLOGY

- [ARCTIC: EXPEDITIONS.] Cambridge Staunings Expedition 1972. *Cambridge Expeditions Journal*, 1974, p. 11-12. [Glaciological studies in Stauning Alper region, east Greenland.]
- DETWYLER, T. R., and REDENTE, A. L. Map of landforms of the Chitstone Pass and Skolai Pass area, Alaska. (In Bushnell, V. C., and Marcus, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4.* New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974, p. 385+map.) [Twelve landform types recognized.]
- HATTERSLEY-SMITH, G. *North of latitude eighty. The Defence Research Board in Ellesmere Island.* Ottawa, Defence Research Board, 1974. ix, 121 p. [General account of post-war field research. Ch. 7 includes results of glaciological studies.]
- KOTLYAKOV, V. M. Mezhdunarodnyy Antarkticheskiy glyatsiologicheskii proyekt (tseli i zadachi, programma i plany) [The international Antarctic glaciological project (aims and problems, programme and plans)]. *Antarktika. Doklady Komissii*, Vyp. 12, 1973, p. 85-93. [Outlines this project, begun in 1971.]
- LEWIS, J. S. Volatile element influx on Venus from cometary impacts. *Earth and Planetary Science Letters*, Vol. 22, No. 3, 1974, p. 239-44. [Comets may be method for all ice arriving on Venus, and this may be source of all hydrogen on Venus.]
- ORHEIM, O. Glaciological studies in the South Shetland Islands. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 172. [Outlines field work carried out in January 1974.]
- PATASHNICK, H., and others. Energy source for comet outbursts, [by] H. Patashnick, G. Rupprecht, D. W. Schuerman. *Nature*, Vol. 250, No. 5464, 1974, p. 313-14. [Letter. Energy may come from amorphous ice in the cometary nucleus changing phase to ice Ic.]
- PIMENTEL, G. C., and others. Evidence about hydrate and solid water in the Martian surface from the 1969 Mariner infrared spectrometer, by G. C. Pimentel, P. B. Forney and K. C. Herr. *Journal of Geophysical Research*, Vol. 79, No. 11, 1974, p. 1623-34. [Evidence that condensed-phase water is present throughout observed surface of Mars and that ice is forming, probably on the planetary surface.]
- SANTEFORD, H. S. A challenge in snow and ice. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 3-8.) [Opening address to participants at the symposium.]
- THOMAS, R. H., and GAYLORD, D. R. Glaciological measurements on the Ross Ice Shelf. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 160-62. [Measurements of ice strain-rates, snow accumulation rates, and 10 m temperatures.]
- VYALOV, S. S., and others. Vozmozhnosti i perspektivy stroitel'stva aerodromov v usloviyakh Antarktity [On the prospects of constructing aerodromes under Antarctic conditions]. [By] S. S. Vyalov, V. D. Ponomarev, S. E. Gorodetskiy. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 191-92. [Suggests optimum conditions for runway construction. English summary, p. 192.]

### GLACIOLOGICAL INSTRUMENTS AND METHODS

- ALGER, G. R., and SANTEFORD, H. S. The snow moisture integrator. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 716-19.) [Describes device for automatically measuring and recording changes in moisture content of a snow sample exposed to ambient weather conditions.]



- ANDERSON, E. Techniques for predicting snow cover runoff. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 840-63.) [Identifies dominant variables in snow hydrology that affect river forecasts and discusses each in terms of areal variability as related to geographical factors. Deals with short-term and seasonal yield forecasts. Discussion, p. 862-63.]
- ATTMANNSPACHER, W., and RIEDL, J. Remote sensing of water content of snow cover at one point or more in a mountain area. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 727-33.) [Describes method and compares with others. Explains discrepancies.]
- BARNES, G. W., jr. A new California Department of Water Resources telemetry system. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 329-38.) [System for obtaining data for flood forecasting and snow-melt forecasting is computer controlled and uses state's microwave system and mountain top VHF radio repeaters for communications.]
- BARNES, J. C., and others. Snow studies using visible and infrared measurements from earth satellites, [by] J. C. Barnes, C. J. Bowley, D. A. Simmes. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 477-86.) [Describes recent studies of application of ITOS and Nimbus thermal infra-red measurements and of ERTS-1 multi-spectral imagery for detecting and mapping snow extent.]
- BARTON, M. New concepts in snow surveying to meet expanding needs. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 39-46.) [Suggests how modern equipment and techniques may be introduced.]
- BASHARINOV, A. E., and others. Satellite measurements of microwave and infrared radiobrightness temperature of the Earth's cover and clouds, by A. E. Basharinov [and 8 others]. *Proceedings of the eighth International Symposium on Remote Sensing of Environment* . . . 1972. . . . Ann Arbor, Willow Run Laboratories, Environmental Research Institute of Michigan, Vol. 1, [1973], p. 291-96. [Presents results of measurements over the southern hemisphere made by Cosmos 384. Includes boundary of floating ice around Antarctica and temperature and state of continental ice covers.]
- BASS, J. S. An electro-optical instrument for measuring total precipitation and snow pack water content. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 699-705.) [Describes optical lever instrument originally developed for oceanographic studies.]
- BELCHIKOV, V. A., and KOREN, V. I. Mathematical model of spring flood formation and possibilities of its use for short-range forecasting. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 972-80.) [Presents model which was tested for medium-size watersheds in the U.S.S.R.]
- BERTRAM, C. L., and others. Locating large masses of ground ice with an impulse radar system, [by] C. L. Bertram, K. J. Campbell and S. S. Sandler. *Proceedings of the eighth International Symposium on Remote Sensing of Environment* . . . 1972. . . . Ann Arbor, Willow Run Laboratories, Environmental Research Institute of Michigan, Vol. 1, [1973], p. 241-60. [Describes electromagnetic sub-surface profiling (ESP) technique.]
- BISSELL, V. C. Natural gamma spectral peak method for snow measurement from aircraft. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 614-23.) [Discusses composition of spectral peak errors and reviews some of the dynamic aspects of the natural radiation environment in the measurement of snow water equivalent by this method.]
- BISSELL, V. C., and PECK, E. L. Measurement of snow at a remote site: natural radioactivity technique. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 604-13.) [Presents results on use of natural gamma radiation from soil as basis for snow water equivalent measurements. Suggests use of cosmic radiation for point snow water equivalent measurement in extremely deep snow.]
- BLYTH, K., and PAINTER, R. B. Analysis of snow distribution using terrestrial photogrammetry. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 679-87.) [Demonstrates feasibility of using technique to determine volume of shallow and frequently ablating snow-packs, with reference to conditions in Great Britain.]
- BRASLAVSKIY, A. P. Calculation of the formation, growth, and melting of ice and snow cover on water storage reservoirs. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1224-30.) [Presents method, based on equation of reservoir heat balance and confined to case in which heat advection into water is negligible.]
- BRYAN, M. L. Ice thickness and variability on Silver Lake, Genesee County, Michigan: a radar approach. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 213-23.) [Remote sensing technique used to identify areas on lake where unsaturated white ice and snow overlie black ice. Survey grid was 100 ft.]
- BRYAN, M. L. Utility of imaging radar for the study of lake ice. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1339-49.) [Reviews various systems, pointing out that side-looking airborne radar (SLAR) has only been recently used in the study of lake ice. Discussion, p. 1349.]
- BULATOV, S. N. Computation of the strength of the melting ice cover of rivers and reservoirs and forecasting of the time of its erosion. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 575-81.) [Presents equation for determining strength of melting ice cover, depending on amount of solar radiation absorbed.]



- BYRD, R. C., and others. Snow measurement using millimetre wavelengths, [by] R. C. Byrd, M. C. Yerkes, W. M. Sackinger and T. E. Osterkamp. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 734–38.) [Measurements reported of backscatter radiation from snow-covered land and lake ice, taken as function of incidence angle.]
- CAMPBELL, K. J., and ORANGE, A. S. Continuous sea and fresh water ice thickness profiling using an impulse radar system. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 432–42.) [Describes electromagnetic sub-surface profiling (ESP) by means of which a clearly recognizable ice–water interface was observed in virtually all conditions of floating ice in Canadian Arctic areas.]
- COX, L. M., and ZUZEL, J. F. Forecasting runoff from universal surface gauge snowmelt investigation measurements. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1089–97.) [Describes method by which daily snow melt as collected by an index snow melt device can be used to forecast run-off for a basin during peak snow-melt events.]
- CRAWFORD, N. H. Computer simulation techniques for forecasting snowmelt runoff. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1062–72.) [Basic mathematical model development is described.]
- CROWDER, W. K., and others. Mesoscale deformation of sea ice from satellite imagery, [by] W. K. Crowder, H. L. McKim, S. F. Ackley, W. D. Hibler III, D. M. Anderson. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 563–73.) [Detailed deformation and movement data were obtained from sequential ERTS-1 images.]
- DMITRIYEV, A. V., and others. Practical use of aircraft gamma-ray survey of snow cover in the USSR, [by] A. V. Dmitriyev, R. M. Kogan, M. V. Nikiforov and Sh. D. Fridman. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 702–12.) [Reviews technique which is valuable over large territories.]
- DOHERTY, B. T., and KESTER, D. R. Freezing point of seawater. *Journal of Marine Research*, Vol. 32, No. 2, 1974, p. 285–300. [Compares three techniques for measurement of freezing point and derives equation for variation with salinity and hydrostatic depth. Applies to temperature distributions on the Ross Ice Shelf.]
- ENGELN, G. B. A graphical and statistical approach to the regional study of snowpack in mountain areas, with special reference to Colorado and New Mexico. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 885–94.) [Describes method for snow-pack study in a mountainous area in relation to its morphology, elevation, latitude and longitude by means of a regional comparative approach.]
- FARNES, P. E. Development and use of mountain precipitation map. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 64–75.) [Describes method which depends on correlation between water equivalent of an average winter snow-pack and average annual precipitation in the Rocky Mountains. Discussion, p. 74–75.]
- FISENKO, V. F., and others. Oslozhneniya i avarii pri glubokom burenii-protaiivanii, ikh likvidatsiya i preuprezhdeniye [Complications and accidents in deep drilling and thawing and their elimination and prevention]. [By] V. F. Fisenko, N. Ye. Bobin, G. K. Stepanov, N. I. Slyusarev, G. N. Solov'yev, V. K. Chistyakov. *Antarktika. Doklady Komissii*, Vyp. 13, 1974, p. 161–66.
- GLOERSEN, P., and others. Polar sea ice observations by means of microwave radiometry, [by] P. Gloersen, T. C. Chang, T. T. Wilheit, W. J. Campbell. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 541–50.) [Discusses some of the seasonal changes observed, as well as changes within a season.]
- GOLDING, D. L. Snowpack calibration on Marmot Creek to detect changes in accumulation pattern after forest-cover manipulation. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 82–95.) [Method devised by which changes in quantity and pattern of accumulation resulting from logging may be evaluated statistically. Tested near Calgary. Discussion, p. 95.]
- GRASTY, R. L., and others. An experimental gamma-ray spectrometer snow survey over southern Ontario, [by] R. L. Grasty, H. S. Loijens, H. L. Ferguson. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 579–93.) [With equipment and procedures described, average water equivalent of snow-pack over 16 km sections was measured to accuracy of 1.2 cm using potassium count information and to 1.7 cm using total radioactivity.]
- GRUMMITT, W. E., and PRANTL, F. A. Use of thermoluminescent dosimeters for studies of the snow cover. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 642–50.) [Discusses feasibility of method for measuring snow depth.]
- GUDMANDSEN, P., and others. *Radioglaciology. Soundings near Isua, southwest Greenland*, by P. Gudmandsen, N. Skou and F. Sandergaard. Lyngby, Technical University of Denmark, Electromagnetics Institute, 1974. (D 224.) [27] leaves. [Presents description of method and results of measuring ice thicknesses in this area.]
- HASHOLT, B. Random sampling technique in measuring snow-water equivalent in a drainage basin. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 680–87.) [Equipment and technique described and used in Danish conditions where snow cover is thin.]
- HELMÄKI, H., and LANGE, A. Snow plate experiments on standard rain-gauge deficiency during snowfall. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 664–69.) [Describes instrument.]



- JIRBERG, R. J., and others. Application of SLAR for monitoring Great Lakes total ice cover, [by] R. J. Jirberg, R. J. Schertler, R. T. Gedney, H. Mark. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 402-11.) [Presents series of X-band side-looking airborne radar (SLAR) images showing development and disintegration of Lake Erie ice cover for winter 1972-73. Compares satisfactorily with ground observations.]
- JONES, E. B., and others. Areal snowpack water-equivalent determinations using airborne measurements of passive terrestrial gamma radiation, [by] E. B. Jones, A. E. Fritzsche, Z. G. Burson, D. L. Burge. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 594-603.) [Determines water equivalent of snow cover over flat or rolling terrain to within  $\pm 1.2$  cm for spatial resolution of 4.8 km using photopeak area technique.]
- JUMKIS, A. R. Dielectric constants in the management of freezing systems. (In Santeford, H. S., and Smith, J. L. comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 753-64.) [Summary and expansion of discussion concerning papers presented by W. I. Linlor and J. L. Smith and by W. I. Linlor, M. F. Meier and J. L. Smith at symposium (ibid., p. 720-28 and p. 729-36).]
- KEYS, J. E., and others. Radar measurement of ice drift in Robeson Channel, 1972, by J. E. Keys, Moira Dunbar, D. J. Finlayson and J. W. Moffat. Ottawa, Dept. of National Defence, Research and Development Branch. Defence Research Establishment Ottawa, 1974. [46] p. (DREO Technical Note No. 74-21.) [Describes technique using X-band radar mounted on a cliff to track transponders placed on ice. Presents preliminary findings.]
- KNIZHNIKOV, YU. F. O krupnomasshtabnoy perspektivnoy aerofotos'yemke lednikov s vertoleta [On large-scale perspective air photography of glaciers from a helicopter]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 238-41. [Discusses method. English summary, p. 241.]
- KOMAROV, V. D. Snowmelt runoff investigations for developing forecast methods. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1083-88.) [Discusses parameters that affect accuracy of forecasts, and evaluates present methods of basin observations that serve as model inputs.]
- KRAVTSOVA, V. I., and others. Ispol'zovaniye kosmicheskikh snimkov dlya izucheniya snezhno-lednikovogo kompleksa b gorakh [Use of space imagery for the study of complexes in mountains]. [By] V. I. Kravtsova, I. A. Labutina, G. K. Tushinskiy. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 174-80. [Discusses many applications of space imagery in Soviet glaciological work. English summary, p. 180.]
- KROUSE, H. R. Stable isotopes in the study of snow and ice resources. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 651-60.) [Reviews techniques.]
- KUDRYASHOV, B. B., and FISENKO, V. F. K teorii bureniya-protaivaniya snezhno-firnovykh otlozheniy i l'dov Antarktidy [The theory of thermal drilling of snow firns and ice of Antarctica]. *Antarktika. Doklady Komissii*, Vyp. 12, 1973, p. 153-58.
- KUDRYASHOV, B. B., and others. Teoriya i praktika bureniya-protaivaniya v Antarktide [Theory and practice of thermal drilling in Antarctica]. [By] B. B. Kudryashov, N. Ye. Bobin, N. I. Slyusarev, G. K. Stepanov, V. F. Fisenko, V. K. Chistyakov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 71-77. [Describes equipment and use in Antarctic conditions. English summary, p. 77.]
- LAUER, D. T., and DRAEGER, W. C. Techniques for determining areal extent of snow in the Sierra Nevada Mountains using high altitude aircraft and spacecraft imagery. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 532-40.) [Sequential air photography, ERTS-1 imagery and ground data were used to develop an image interpretation key for estimating areal extent of snow in forested areas, and for developing an analysis technique for estimating extent of snow cover on satellite imagery.]
- LEADER, R. E. Meteor burst communication. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 737-47.) [Discusses application to remote data acquisition and control. System is suitable for low data-rate telemetry such as that encountered in hydrological and meteorological data sensing.]
- LIMPERT, F. A., and SMITH, J. L. Utility of isotope profiling snow gage for water management. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 624-31.) [Describes profiler system, method for translating field measurement data to management use, and existing and proposed utilization of data for management purposes.]
- LING, C. H., and UNTERSTEINER, N. On the calculation of the roughness parameter of sea ice. *Journal of Geophysical Research*, Vol. 79, No. 27, 1974, p. 4112-14. [Describes method for calculating roughness parameter  $z_0$  of sea ice from velocity profiles. Instead of conventional procedure of determining individual  $z_0$  for each observed velocity profile, method uses number of profiles to find single value for  $z_0$ .]
- LINLOR, W. I. Snowpack water content by remote sensing. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 713-26.) [Describes electromagnetic systems. Discussion, p. 726.]
- LINLOR, W. I., and SMITH, J. L. Electronic measurements of snow sample wetness. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 720-28.) [Two methods described, one based on measuring capacitance of sample before and after freezing and the other on *in situ* measurements of dielectric loss of sample in high frequency field.]
- LINLOR, W. I., and others. Microwave profiling of snowpack free-water content, [by] W. I. Linlor, M. F. Meier, J. L. Smith. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow*



- and ice resources. . . . Washington, D.C., National Academy of Sciences, 1974, p. 729-36.) [Proposes microwave system operating in range  $(1 \text{ to } 10) \times 10^9$  Hz to measure amount of liquid-phase water in snow-pack, attenuation of beam between source and receivers being produced by water in snow.]
- LOUGEAY, R. Detection of buried glacial and ground ice with thermal infrared remote sensing. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 487-93.) [Method based on close correlation between surface temperature, and thus emitted terrestrial radiation, and thickness of detritus.]
- MCCLAINE, E. P. Some new satellite measurements and their application to sea ice analysis in the Arctic and Antarctic. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 457-66.) [Describes and discusses performance of NOAA-2 satellite carrying a very high resolution radiometer (VHRR) capable of 1 km ground resolution in visible and thermal infra-red portions of the spectrum.]
- MCCGINNIS, D. F. Detecting melting snow and ice by visible and near-infrared measurements from satellites. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 751-61.) [During melting, near-infra-red radiation is strongly absorbed, whereas visible radiation is strongly reflected. Examples presented from Canada and the Alps. Discussion, p. 760-61.]
- MCCGINNIS, D. F. Satellite detection of melting snow and ice by simultaneous visible and near-IR measurements. *Proceedings of the eighth International Symposium on Remote Sensing of Environment* . . . 1972. . . . Ann Arbor, Willow Run Laboratories, Environmental Research Institute of Michigan, Vol. 1, [1973], p. 231-40. [Comparison of simultaneous visible and near-infra-red imagery from Nimbus-III satellite provides method for monitoring melting of snow and ice that may be applied to snow-pack run-off prediction, flood forecasting and lake navigation.]
- MCGOWN, A., and DERBYSHIRE, E. Technical developments in the study of particulate matter in glacial tills. *Journal of Geology*, Vol. 82, No. 2, 1974, p. 225-35. [Describes several techniques for laboratory and field use.]
- MAKAREVICH, T. N., and others. Duration of ice phenomena and possibilities of its forecasting (for the Danube), [by] T. N. Makarevich, Z. A. Yefrimova and L. K. Savina. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1243-50.) [Two methods suggested.]
- MARKO, J. R., and GOWER, J. F. R. *An assessment of the uses of ERTS-1 Arctic imagery*. Victoria, B.C., Environment Canada. Fisheries and Marine Service, Marine Sciences Directorate, 1974. 36 p. (Pacific Marine Sciences Report 74-8.) [Summary and evaluation of this technique in monitoring movements, growth and melting of ice. Inside cover: "This is a manuscript which has received only limited circulation".]
- MEIER, M. F. Measurement of snow cover using passive microwave radiation. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 739-50.) [Presents results supporting use of this method for measuring snow distribution. Discussion, p. 750.]
- MILLER, L., and MILLER, D. The computer as an aid in avalanche hazard forecasting. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 356-62.) [Preliminary results indicate that rapid accurate forecasts can be made using a selective regression programme. Method based on 21 years' daily weather and avalanche observations.]
- MURAKAMI, M. Method of forecasting date of breakup of river ice. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1231-37.) [Based on data from Harbin, north-east China, 1919-41.]
- PARASHAR, S. K., and others. Use of radar techniques for sea ice mapping, [by] S. K. Parashar, R. K. Moore, A. W. Biggs. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 381-90.) [Radar scattering data from sea ice at 400 MHz and 13.3 GHz were analysed for an April flight near Point Barrow, Alaska, and seven categories of ice were identified on air photographs.]
- PATERSON, W. S. B., and KOERNER, R. M. Radio echo sounding on four ice caps in Arctic Canada. *Arctic*, Vol. 27, No. 3, 1974, p. 225-33. [Techniques and results described of measuring ice thickness by means of sledge-mounted SCR 718 radar altimeter on parts of ice caps on Devon, Ellesmere, Meighen and Melville islands.]
- PECK, E. L., and others. Lake Ontario snowfall observational network for calibrating radar measurements, [by] E. L. Peck, L. W. Larson, J. W. Wilson. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 412-21. [Stresses importance of correct siting of gauges; specially installed network used for comparison with radar gave better results than usual climate stations in same area.]
- POULIN, A. O. Hydrologic characteristics of snow-covered terrain from thermal infrared imagery. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 494-503.) [Differing sub-surface thermal regimes of streams, frozen lakes and areas of deeper snow often produce surface temperature differences that are sufficient for the production of thermal images of those features. Method considered in detail.]
- PRANTL, F. A., and others. Alpine glacier studies with nuclear methods, [by] F. A. Prantl, W. Ambach and H. Eisner. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 435-44.) [Method described for identifying and dating annual horizons and net accumulations by variations of fission product activities. Discussion, p. 443-44.]
- PRANTL, F. A., and others. Nuclear techniques for snow and ice studies in Canadian subpolar regions (Devon Island), [by] F. A. Prantl, R. M. Koerner, E. Robertson. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy



- of Sciences, 1974, p. 632-41.) [Shows potentialities and limitations of isotope techniques in identifying origin and seasonal patterns of recent snow deposits, dating annual layers and determining net accumulation dates.]
- PROSKURYAKOV, B. V., and BERDENNIKOV, V. P. Hydraulic method for evaluation of ice-gorges on rivers. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 547-56.) [Describes method used for evaluation of thickness of ice jams in rivers in the U.S.S.R. Discussion, p. 556.]
- QUICK, M. C., and PIPES, A. Daily and seasonal runoff forecasting with a water budget model. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1017-34.) [Describes method for calculating stream flow run-off arising from both snow melt and rainfall. Discussion, p. 1033-34.]
- RECHARD, P. A., and others. Measuring snowfall, a critical factor for snow resource management, [by] P. A. Rechard, R. E. Brewer, A. Sullivan. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 706-15.) [Suggests that in windy areas existing snow gauges should be calibrated against a gauge within a shield.]
- ROCKWOOD, D. M. New techniques in forecasting runoff from snow. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1058-61.) [Discusses philosophy of design of hydrologic models to be used in forecasting basin response in operational hydrology, as developed from experience in the Columbia River basin.]
- SAVCHENKOVA, E. I. Atmospheric circulation and forecasting of dates of ice formation in rivers. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1196-1201.) [Describes method for long-range forecasting, based on atmospheric circulation analysis for period preceding event to be predicted in region where river basin is located.]
- SCHERTLER, R. J., and others. Application of thermal imagery to the development of a Great Lakes ice information system, [by] R. J. Schertler, C. A. Raquet, R. A. Svehla. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 513-22.) [Reviews preliminary findings. Relative thicknesses of ice may be delineated and new ice differentiated from open water and thicker ice.]
- SHREVE, D. C., and BROWN, A. J. Development and field testing of a remote radioisotopic snow gage. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 661-73.)
- SOUTHARD, R. B., and MACDONALD, W. R. ERTS-1 imagery applications in polar regions. *Antarctic Journal of the United States*, Vol. 9, No. 3, 1974, p. 61-67. [Describes glaciological applications.]
- SUKHANOV, L. A. Izmereniye moshchnosti gornyx lednikov radiolokatsionnyy metodom [The measurement of glacier thickness in mountains by the radio-echo sounding method]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 58-65. [Describes drawbacks of standard technique and proposes simpler method. English summary, p. 65.]
- SUKHANOV, L. A., and others. Portativnyye ledovyye termoelektrobury [Portable ice thermoelectric drills]. [By] L. A. Sukhanov, V. A. Morev, I. A. Zotikov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 234-38. [Describes construction and use, and how the internal structure of the ice may be studied by measuring drilling speed. English summary, p. 238.]
- TSANG, G. Conceptual design of a multipurpose instrument for winter stream metering. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 688-98.) [Proposes theoretical design for instrument for measuring flow velocity at a point in a stream and concentration and velocity of frazil ice at this point.]
- TSURIKOV, V. L. K voprosu o temperature zemerzaniya morskoy vody [The freezing temperature of sea water]. *Okeanologiya*, Tom 14, Vyp. 2, 1974, p. 263-68. [Reviews various methods. English summary, p. 268.]
- VICKERS, R. S., and ROSE, G. C. High resolution measurements of snowpack stratigraphy using a short pulse radar. *Proceedings of the eighth International Symposium on Remote Sensing of Environment* . . . 1972. . . . Ann Arbor, Willow Run Laboratories, Environmental Research Institute of Michigan, Vol. 1, [1973], p. 261-77. [Shows that short-pulse radar technique may be used for remote sensing of depth or density of snow-pack, and water equivalent may also be measured as long as significant quantities of free water are not present.]
- VICKERS, R. S., and others. Airborne profiling of ice thickness using a short pulse radar, [by] R. S. Vickers, J. E. Heighway, R. T. Gedney. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 422-31.) [Demonstrates that system, operating at 2.7 GHz, can make accurate measurements of simple smooth sea ice sheets up to 10 cm thick and can give an indication of structure of rough-surfaced or broken ice.]
- VICKERS, W. W., and others. Polar region snow stratigraphy techniques applied to commercial problems, [by] W. W. Vickers, M. E. Lopez, J. Branch. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 30-38.) [Technique was used to measure small quantities of precipitation associated with weather modification experiments and in studying snow erosion in proposed ski slope area.]
- WASHICHEK, J. N. Collection of atmospheric data for Project Skywater. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 644-55.) [Describes techniques used to collect snow data on projects in Colorado and New Mexico, and summarizes results. Discussion, p. 655.]
- WIESNET, D. R. The role of satellites in snow and ice measurements. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 447-56.) [Suggests that more use should be made of satellites.]



- WILLIAMS, P. J., and BURT, T. P. Measurement of hydraulic conductivity of frozen soils. *Canadian Geotechnical Journal*, Vol. 11, No. 4, 1974, p. 647-50. [Describes experimental technique.]
- WILSON, J. W. Measurement of snowfall by radar. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 391-401.) [Measurements obtained by radar compared to those obtained by snow gauges. Advantages and limitations discussed.]
- YOUNG, G. J. A data collection and reduction system for snow accumulation studies. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 304-13.) [Describes method for providing maps of snow accumulation from irregularly spaced point sampling locations.]
- ZAGORODNIKOV, A. A., and others. Two-dimensional statistical analysis of radar imagery of sea ice, [by] A. A. Zagorodnikov, V. S. Loshchilov, K. B. Chelyshev. *Proceedings of the eighth International Symposium on Remote Sensing of Environment* . . . 1972. . . . Ann Arbor, Willow Run Laboratories, Environmental Research Institute of Michigan, Vol. 1, [1973], p. 279-90. [Technique based on two-dimensional Fourier transformation of small-scale SLAR images of ice cover by means of optical image filtering.]

## PHYSICS OF ICE

- BILGRAM, J. H. Phase equilibria and point defects in ice. *Physics of Condensed Matter*, Vol. 18, No. 4, 1974, p. 263-73. [General theory of point defects in crystals derived using chemical potentials and applied to Bjerrum defects in ice.]
- BILGRAM, J. H., and GRÄNICHER, H. Defect equilibria and conduction mechanisms in ice. *Physics of Condensed Matter*, Vol. 18, No. 4, 1974, p. 275-91. [Data on electrical properties of ice reinterpreted. The two types of defect involved are Bjerrum defects and Bjerrum-ion aggregates.]
- BOZZO, A. T., and others. The properties of the hydrates of chlorine and carbon dioxide, [by] A. T. Bozzo, H.-S. Chen, J. R. Kass and A. J. Barduhn. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973*, Vol. 3, p. 437-51.) [Determination of phase diagrams.]
- BURTON, W. R., and LLOYD, A. I. Design features of secondary refrigerant freezing plants. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973*, Vol. 3, p. 281-90.) [Describes process for desalination by freezing that has been developed to large scale and can give estimate of commercial cost.]
- CHEN, E. C., and others. Spreading of crude oil on an ice surface, [by] E. C. Chen, J. C. K. Overall and C. R. Phillips. *Canadian Journal of Chemical Engineering*, Vol. 52, No. 1, 1974, p. 71-74. [Results of laboratory studies.]
- DENTON, W. H., and others. Experimental studies on washing and melting ice crystals in the immiscible refrigerant freezing process, [by] W. H. Denton, M. J. S. Smith, J. T. Klaschka, R. Forgan, H. R. Diffey, C. H. Rumary and R. W. Dawson. *Desalination*, Vol. 14, No. 3, 1974, p. 263-90. [Description of large-scale experimental study. Also published in: European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973*, Vol. 3, p. 291-311.]
- EVANS, T. W., and others. Models of secondary nucleation attributable to crystal-crystallizer and crystal-crystal collisions, [by] T. W. Evans, A. F. Sarofim and G. Margolis. *A.I.Ch.E. Journal*, Vol. 20, No. 5, 1974, p. 959-66. [Theory of process of generation of secondary nuclei during freezing of water.]
- FOSS, S. D., and FAN, S. S. T. Approximate solution to the freezing of the ice-water system with constant heat flux in the water phase. *Water Resources Research*, Vol. 10, No. 3, 1974, p. 511-13. [Obtained by utilizing assumption of quasi-steady-state profile for solution to Stefan problem, and applies to two hypothetical cases.]
- FOURNIER, J., and others. Water desalination by natural freezing, [by] J. Fournier, J. L. Grange and S. Vergara. *Desalination*, Vol. 15, No. 2, 1974, p. 167-75. [Salt water can be frozen by being exposed to the night sky in northern Chile, and this can give fresh water in the Atacame desert. Also published as "Dessalement de l'eau par congélation naturelle" in: European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973*, Vol. 3, p. 321-29.]
- FRASER, J. H., and OLSSON, T. A. An economic analysis of the Avco crystallization process. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973*, Vol. 3, p. 331-42.) [Costs a promising method for freezing desalination.]
- GANGWANI, G. S., and KOTHARI, L. S. Incomplete neutron thermalization in light water ice at 77, 21 and 4 K. *Nuclear Science and Engineering*, Vol. 55, No. 2, 1974, p. 242-43. [Cooling an ice moderator below 40 K does not change neutron energy. A theoretical model is used to show this would not occur if absorption in ice were less.]
- GERARD, N., and PERNOLET, R. A study of the process of formation of ethylene and ethane clathrate hydrate by thermogravimetry and X-ray diffraction. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973*, Vol. 3, p. 453-60.) [Formation process studied and crystal structure determined.]
- GERBER, H. E. Freezing water with sized AgI particles. *Dissertation Abstracts International*, B, Vol. 34, No. 9, 1974, p. 4566-B. [Experiments on effectiveness as ice nuclei of particles of various sizes and comparison with theory. Abstract of Ph.D. thesis, Colorado State University. University Microfilms order no. 74-5421.]



- GIBSON, W., and others. Spray freezer and pressurized counterwasher for freeze desalination, [by] W. Gibson, D. Emmermann, G. Grossman, R. Johnson, A. Modica and A. Pallone. *Desalination*, Vol. 14, No. 3, 1974, p. 249-62. [Description of method of freezing a spray of water using an immiscible refrigerant. This gives ice platelets without dendrites. Also published in: European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973*, Vol. 3, p. 343-55.]
- HAIDA, O., and others. Calorimetric study of the glassy state. X. Enthalpy relaxation at the glass-transition temperature of hexagonal ice, [by] O. Haida, T. Matsuo, H. Suga and S. Seki. *Journal of Chemical Thermodynamics*, Vol. 6, No. 9, 1974, p. 815-25. [Anomaly in heat capacity of ice Ih found at *c.* 100 K. Spontaneous temperature changes during annealing near 100 K followed. Results interpreted in terms of proton ordering and thermal parameters deduced.]
- HIGASHI, A. Growth and perfection of ice crystals. *Journal of Crystal Growth*, Vols. 24-25, 1974, p. 102-07. [Study of dislocations in ice crystals shows Bridgman method can give dislocation densities as low as  $10^2 \text{ cm}^{-2}$  whereas Czochralski method gives  $10^4 \text{ cm}^{-2}$ .]
- HOBSON, M. D., and McGRATH, L. Desalination by means of continuous column crystallizers. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973*, Vol. 3, p. 357-69.) [Description of experiments.]
- HSU, K.-S. Spectral evolution of ice ripples. *Dissertation Abstracts International*, B, Vol. 35, No. 1, 1974, p. 247-B. [Heat balance of interface between ice and a turbulently flowing liquid studied theoretically and experimentally. Abstract of Ph.D. thesis, University of Iowa, 1973. University Microfilms order no. 74-16641.]
- INCHACKAL, J. J. Dielectric properties of pure and KF doped hexagonal ice. *Dissertation Abstracts International*, B, Vol. 35, No. 5, 1974, p. 2374-B. [Measurements down to  $-90^\circ \text{C}$  and from 50 to 20 000 Hz. Abstract of Ph.D. thesis, Saint Louis University, 1973. University Microfilms order no. 74-24099.]
- INOUE, K., and others. Slow neutron spectra in cold moderators, [by] K. Inoue, N. Otomo, H. Iwasa and Y. Kiyonagi. *Journal of Nuclear Science and Technology*, Vol. 11, No. 5, 1974, p. 228-29. [Includes spectra in ice.]
- JACKSON, K. A. The present state of the theory of crystal growth from the melt. *Journal of Crystal Growth*, Vols. 24-25, 1974, p. 130-36. [Recent advances in our understanding of this reviewed.]
- JOHARI, G. P., and others. Dielectric properties of ice VII and VIII and the phase boundary between ice VI and VII, [by] G. P. Johari, A. Laverne and E. Whalley. *Journal of Chemical Physics*, Vol. 61, No. 10, 1974, p. 4292-300. [Dielectric properties of ice VII give correlation parameter on half that for ice I; this suggests dipoles are more antiparallel than randomness would dictate and entropy of transition from ice VI to ice VII and ice VIII confirms this.]
- JOHNSON, W., and others. Freeze desalting. A new approach, [by] W. Johnson, A. Pallone and R. F. Probststein. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973*, Vol. 3, p. 371-82.) [Description of new method of desalination based on droplet evaporation.]
- KAWASAKI, S. Studies on crystallization of ice by butane gas agitation in freezing desalination process. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973*, Vol. 3, p. 383-93.) [Uses butane to improve stirring during freezing desalination.]
- KHORGUANI, V. G., and others. L'doobrazuyushchaya aktivnost' aerorozley AgI i PbI<sub>2</sub> poluchennykh pri vzryve [Ice-forming activity of silver iodide and lead iodide aerosols obtained by explosion]. [By] V. G. Khorguani, A. S. Zhikharev, G. B. Myakon'kiy. *Izvestiya Akademii Nauk SSSR. Fizika Atmosfera i Okeana*, Tom 10, No. 1, 1974, p. 100-04. [Description of tests.]
- KROH, J., and others. On electron tunnelling in  $\gamma$ -irradiated frozen matrices, [by] J. Kroh, C. Stradowski and W. Bartczak. *Chemical Physics Letters*, Vol. 27, No. 3, 1974, p. 387-88. [Discussion of paper by J. R. Miller, *ibid.*, Vol. 22, No. 1, 1973, p. 180-82, on tunnelling of trapped electrons in  $\gamma$ -irradiated alkaline ice in presence of scavengers.]
- KVLIVIDZE, V. I., and others. The mobile water phase on ice surfaces, [by] V. I. Kvlividze, V. F. Kiselev, A. B. Kurzayev and L. A. Ushakova. *Surface Science*, Vol. 44, No. 1, 1974, p. 60-68. [Nuclear magnetic resonance of finely dispersed ice has narrow central signal attributable to surface-mobile water.]
- LAMB, D., and SCOTT, W. D. Mechanism of ice crystal growth and habit formation. *Journal of the Atmospheric Sciences*, Vol. 31, No. 2, 1974, p. 570-80. [Remarkable temperature dependence of all growth variables on faces of ice crystal attributed to formation of multiple layers of adsorbed water molecules.]
- LANGHAM, E. J. Network geometry of veins in polycrystalline ice. *Canadian Journal of Earth Sciences*, Vol. 11, No. 9, 1974, p. 1274-79. [Geometrical constraints are discussed and a model proposed.]
- LENTZ, B. R., and others. Vibrational frequencies of water clusters, [by] B. R. Lentz, A. T. Hagler and H. A. Scheraga. *Journal of Physical Chemistry*, Vol. 78, No. 18, 1974, p. 1844-47. [Theoretical studies which lead to interpretation of internal normal mode frequency spectrum of ice I.]
- LEVI, L., and others. Structure of ice grown from droplet accretion and solidification processes, [by] L. Levi, E. M. de Achaval and L. Lubart. *Journal of Crystal Growth*, Vol. 22, No. 4, 1974, p. 303-10. [Study of *c*-axis orientation relative to growth direction for various ambient and deposition temperatures.]
- NAGLE, J. F. Dielectric constant of ice. *Journal of Chemical Physics*, Vol. 61, No. 3, 1974, p. 883-88. [Theory of dielectric permittivity of ice on Bernal-Fowler-Pauling model relaxed to allow Bjerrum faults.]
- OMRAN, A. M., and KING, C. J. Kinetics of ice crystallization in sugar solutions and fruit juices. *A.I.Ch.E. Journal*, Vol. 20, No. 4, 1974, p. 795-803. [Secondary nucleation kinetics derived from experiments with various solutes, supersaturations, and supercoolings.]
- PASSARELLI, R. E., Jr., and others. Ice nucleation by Miersite, [by] R. E. Passarelli, Jr., H. Chessin and B. Vonnegut. *Journal of Applied Meteorology*, Vol. 13, No. 5, 1974, p. 610-12. [This naturally occurring AgI-CuI mineral can nucleate ice in supercooled water at  $-1.42^\circ \text{C}$ .]



- PENNINO, U. DEL, *and others*. Polarization phenomena induced by cracks in Ih ice crystals, by U. del Pennino, A. Loria, S. Mantovani and E. Mazzeza. *Nuovo Cimento della Società Italiana di Fisica*, Ser. 11, Vol. 24B, No. 1, 1974, p. 108–20. [Large potentials observed when ice cracked mechanically on prismatic planes. Decay observed consistent with L-defect mechanism. Italian and Russian abstracts, p. 120.]
- PERRY, J. W. Complex refractive index of ice fog at a radio wavelength of 3 mm. *Dissertation Abstracts International*, B, Vol. 34, No. 9, 1974, p. 4381-B. [Measurements in resonant cavity used to measure this, also measurements on ice slabs at 97 GHz. Abstract of Ph.D. thesis, University of Texas at Austin, 1973. University Microfilms order no. 74-5310.]
- PINTO, A. C. DI, *and others*. Study of the project and operation parameters in a freezing pilot plant with secondary refrigerant, [by] A. C. di Pinto, G. Lacava, R. Passino, A. Rozzi, M. Santori and L. Spinosa. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9–14 September 1973*, Vol. 3, p. 313–20.) [Description of testing of pilot plant.]
- RAUTENBACH, R., *and PENNINGS*, P. Untersuchungen zur Waschung von Hydrat- und Eiskristallen nach dem Gegenstrom-Prinzip. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9–14 September 1973*, Vol. 3, p. 471–76.) [Method of separating and washing ice and hydrate crystals forming in brine.]
- ROHATGI, P. K., *and others*. Effect of magnetic and electrical fields on dendritic freezing of aqueous solutions of sodium chloride, [by] P. K. Rohatgi, S. M. Jain, C. M. Adams, Jr. *Materials Science and Engineering*, Vol. 15, Nos. 2–3, 1974, p. 283–90. [Experiments on both droplet and bulk freezing. Magnetic fields give change in dendrite structure; electric fields do not.]
- SANTRY, D. P. Molecular orbital studies on ice-II. *Chemical Physics Letters*, Vol. 27, No. 4, 1974, p. 464–66. [Theoretical calculation of structural parameters of ice II gives good agreement with experimental data.]
- SHEN, J. HAI-I MA. Water adsorption and ice nucleation on silicas and silicates. *Dissertation Abstracts International*, B, Vol. 35, No. 4, 1974, p. 1602-B. [Study of mechanism of ice nucleation in water in process of adsorption. Abstract of Ph.D. thesis, Lehigh University, 1974. University Microfilms order no. 74-21440.]
- SIMPSON, H. C., *and others*. Evaporation of butane drops in brine, [by] H. C. Simpson, G. C. Beggs and M. Nazir. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9–14 September 1973*, Vol. 3, p. 409–20.) [Ciné film study of bubble velocity and growth rate.]
- SIMPSON, H. C., *and others*. The growth of ice crystals, [by] H. C. Simpson, G. C. Beggs, J. Deans and J. Nakamura. *Desalination*, Vol. 14, No. 3, 1974, p. 341–57. [Study of *a*- and *c*-axis growth rates of ice in water and brine. Also published in: European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9–14 September 1973*, Vol. 3, p. 395–407.]
- SOUTHERN, E. The friction of rubber on ice. *Chemistry and Industry* (London), 1974, No. 7, p. 286–88. [Experiments on friction of tyres on ice. High coefficients of friction can be achieved.]
- STEPAKOFF, G. L., *and others*. Development of a eutectic freezing process for brine disposal, [by] G. L. Stepakoff, D. Siegelman, R. Johnson and W. Gibson. *Desalination*, Vol. 15, No. 1, 1974, p. 25–38. [Laboratory study of the process of freezing brine at the eutectic shows that ice and salt crystals form two distinct phases which can subsequently be separated. Also published in European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9–14 September 1973*, Vol. 3, p. 421–33.]
- VANT, M. R., *and others*. Dielectric properties of fresh and sea ice at 10 and 35 GHz, [by] M. R. Vant, R. B. Gray, R. O. Ramseier, V. Makios. *Journal of Applied Physics*, Vol. 45, No. 11, 1974, p. 4712–17. [Results presented and interpreted on dielectric model for sea ice.]
- VLAHAKIS, J. G., *and BARDUHN*, A. J. Growth rate of an ice crystal in flowing water and salt solutions. *A.I.Ch.E. Journal*, Vol. 20, No. 3, 1974, p. 581–91. [Measurements to test theory of Fernandez and Barduhn. Agreement good for pure water, giving ice-water surface energy  $33 \pm 6$  erg cm<sup>-2</sup>. Growth rates much higher than predicted in salt solutions.]
- WEY, J. S., *and ESTRIN*, J. The growth and nucleation of ice in a batch Couette flow crystallizer. *Desalination*, Vol. 14, No. 1, 1974, p. 103–20. [Experimental study of ice-crystal size distribution when formed in flowing brine.]
- WHALLEY, E. The O–H distance in ice. *Molecular Physics*, Vol. 28, No. 4, 1974, p. 1105–08. [Evidence that the O–H distance in ice is nearer to the vapour value than to 1.01 Å as often quoted.]
- WILMS, D. A., *and HAUTE*, A. A. VAN. Determination of the composition of a gas hydrate by the method of Miller and Strong, applying the solid solution theory. (In European Federation of Chemical Engineering. Working Party on Fresh Water from the Sea. *4th International Symposium on Fresh Water from the Sea, Heidelberg, 9–14 September 1973*, Vol. 3, p. 477–84.) [Corrects an error in the theory of this method of determining clathrate composition.]

## LAND ICE. GLACIERS. ICE SHELVES

- ALIVERTI, G., *and others*. Sopra un "surge" di acqua accaduto sul ghiacciaio del Lys (Monte Rosa), [by] G. Aliverti, P. Colombino e A. de Maio. *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 21, 1973, p. 7–18. [Describes water surge on this Italian glacier, first observed in December 1971.]
- ARAPOV, P. P. Pryanmye izmereniya isparennya, tayaniya i teplopotokov na lednikakh [Direct measurements of evaporation, melting and heat fluxes on glaciers]. *Materialy Glytsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 117–22. [English summary, p. 121–22.]
- [ARCTIC: EXPEDITIONS.] Cambridge Arctic Norway Expedition 1973. *Cambridge Expeditions Journal*, 1974, p. 13–14. [Study of subglacial drainage and of characteristics of outwash streams of Strupbreen, Lyngen peninsula.]



- AUFDEMBERGE, T. P. Energy-balance studies over glacier and tundra surfaces, Chitistone Pass, Alaska, summer 1969. (In Bushnell, V. C., and Marcus, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4.* New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974, p. 63-79.) [Compares results of simultaneous studies over Capps Glacier ice surface and over near-by tundra.]
- BARKOV, N. I. Rezul'taty issledovaniya skvazhiny i ledyanogo kerna na stantsii Vostok v 1970-1972 gg. [Results of the investigation of the bore hole and ice core at "Vostok" in 1970-72]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 77-81. [500 m hole and core, Antarctica. English summary, p. 81.]
- BARNETT, A. P. Hydrological studies of the Slims River, Yukon, June-August 1970. (In Bushnell, V. C., and Marcus, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4.* New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974, p. 143-50.) [Shifts of Kaskawulsh Glacier melt-water drainage from the Slims to the Kaskawulsh River was major factor in intraseasonal variations of drainage. Otherwise, drainage varied diurnally and seasonally in accordance with climatological and physiographic factors.]
- BAZHEVA, V. YA., and PSAREVA, T. V. Strukturno-tektonicheskoye stroeniye tipichnogo dolinnogo lednika Kavkaza [Structural and tectonic patterns of a typical Caucasian valley glacier]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 163-68. [Detailed study of Lednik Marukh. English summary, p. 168.]
- BOBIN, N. YE., and FISENKO, V. F. Opyt termobureniya skvazhin s otborom kerna v pokhodnykh usloviyakh [Drilling and core sampling in traverse conditions]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 88, 1974, p. 74-76. [Drilling and coring ice along the profile from Mirny to the 170 km mark.]
- BUSHNELL, V. C., and MARCUS, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4.* New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974. xi, 385 p. [Some articles have been published previously; the others, where glaciological in content, are listed separately.]
- CAILLEUX, A., and LAGAREC, D. Nombre, surface et volume des glaciers du Globe. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences (Paris)*, Sér. D, Tom. 279, No. 3, 1974, p. 243-45. [In addition to the Antarctic and Greenland ice sheets, there are 141 glaciers greater than 1 000 km<sup>2</sup> (total surface area 663 000 km<sup>2</sup>, volume 175 000 km<sup>3</sup>) and 10 000 glaciers greater than 1 km<sup>2</sup> (surface area 865 000 km<sup>2</sup>, volume 200 000 km<sup>3</sup>). Total number of glaciers on Earth is between 70 000 and 200 000.]
- CHIZHOV, O. P. Sovremennyye glyatsioklimaticheskiye usloviya severnoy polyarnoy oblasti i ikh izmeneniya za istoricheskoye vremya [Present-day glacioclimatic conditions of the northern polar regions and their changes during historic times]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 93-99. [English summary, p. 99.]
- DAVIDOVICH, N. V. O temperaturnykh razlichiyakh bliz fronta gornogo lednika [On temperature differences near the end of a mountain glacier]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 34-40. [Presents air temperature measurements taken over terminus and moraines of Lednik Igan, Polyarnyy Ural. English summary, p. 40.]
- DOLGUSHIN, L. D., and OSIPOVA, G. B. Ocherednaya podvizhka lednika Medvezh'yego v 1973 g. [The current surge of Lednik Medvezhiy in 1973]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 37-38.
- DOLGUSHIN, L. D., and OSIPOVA, G. B. Regime of a surging glacier between advances. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 2, p. 1150-59.) [Presents observations on Lednik Medvezhiy. Discussion, p. 1171.]
- DUSHKIN, M. A. Basseyn r. Chuya [Basin of the river Chuya]. *Katalog lednikov SSSR [Catalogue of glaciers of the U.S.S.R.]*, Tom 15, Vyp. 1, Chast' 6, 1974, [60] p. [Part of I.H.D. catalogue giving details of what is known of glaciers in this part of the Altay mountains and upper Irtysh. The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR [Surface water resources of the U.S.S.R.]*.]
- DYURGEROV, M. B., and FREYDLIN, V. S. Raschet poverkhnostnoy ablyatsii gorno-lednikogo basseyna [Calculation of surface ablation of a mountain glacier basin]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 112-17. [Presents method for calculating surface ablation at any point on the glacier, and applies to Lednik Dzhankuat, Caucasus. English summary, p. 117.]
- ENGLAND, J. Advance of the Greenland ice sheet on to north-eastern Ellesmere Island. *Nature*, Vol. 252, No. 5482, 1974, p. 373-75. [Reviews and discusses evidence, which seems inconclusive.]
- ESCRITT, E. A. *North Iceland glacier inventory. Manual for the use of field survey parties.* [Castleton], Young Explorers' Trust, [1974]. [v], 60 p. [Prepared for the use of groups in the Trollaskagi district, north-west of Akureyri.]
- GOBODZHISHVILI, R. G. Dinamika lednikov Tsentral'nogo Kavkaza po mikrostadial'nyim morenam [Dynamics of glaciers of the central Caucasus from microstadial moraines]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya*, 1973, No. 6, p. 76-82. [Study of glacier flow.]
- GOLUBEV, G. N., and others. Vodnyy balans reprezentativnogo gorno-lednikovogo basseyna MGD Dzhankuat i metody yego izmereniya i rascheta [Water balance of the Dzhankuat I.H.D. glacier basin and methods of its measurement and calculation]. [By] G. N. Golubev, M. B. Dyurgerov, V. S. Freydlin. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 130-37. [Balance negative for 1968-69, 1969-70, 1970-71. English summary, p. 137.]
- GUS'KOV, A. S. Issledovaniya v reprezentativnom gorno-lednikovom basseyne r. Bol'shaya Khadata na Polyarnom Urale v 1971-72 balansovom gody [Studies of representative mountain glacier basin of the river Khadata in Polyarnyy Ural in the 1971-72 balance year]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 193-97. [Meteorological factors studied. English summary, p. 197.]
- HOFFMANN, J. W., and CLARKE, G. K. C. Periodic temperature instabilities in sub-polar glaciers. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972*.)



- ... 1973, Vol. 1, p. 445-53.) [Could account for known periodicity of certain surging glaciers, and suggests promising surge mechanism. Discussion, p. 452-53.]
- HUGHES, T. J. Ice crater closure studies on Deception Island. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 172-74. [Final measurements of the glaciological regime resulting from an ice crater blasted through the snout of Bynon Hill glacier during an August 1970 volcanic eruption were completed in 1973-74.]
- HUGHES, T. J. Is the west Antarctic ice sheet disintegrating? *ISCAP Bulletin* (Ohio State University), No. 2, 1973, v. 1, 163 p. [Ice Stability Coordinated Antarctic Program (ISCAP) is study of apparent instabilities in the Antarctic ice sheet and how this affects global climatic stability. The science plan is here presented.]
- [IRAN: GLACIERS.] Former small glacier on Ustarinan Kuh, Zagros Mountains, Iran. *Geographical Journal*, Vol. 140, Pt. 2, 1974, p. 352. [No trace left of glacier observed in 1969.]
- JACOBS, J. D., and others. Glaciological and meteorological studies on the Boas Glacier, Baffin Island, for two contrasting seasons (1969-70 and 1970-71), [by] J. D. Jacobs, J. T. Andrews, R. G. Barry, R. S. Bradley, R. Weaver and L. D. Williams. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, ... 1972. ... 1973, Vol. 1, p. 371-82.) [For 1969-70, net winter balance was 0.4 m H<sub>2</sub>O and net balance for year was +0.37 m H<sub>2</sub>O. For 1970-71, corresponding figures were 0.26 m H<sub>2</sub>O and -0.2 m H<sub>2</sub>O. Discussion, p. 382.]
- JENSEN, H., and LANG, H. Forecasting discharge from a glaciated basin in the Swiss Alps. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, ... 1972. ... 1973, Vol. 2, p. 1047-54.) [Study of run-off from glaciated region in catchment area of hydroelectric power plant in attempt to establish short-range forecasts of the discharge.]
- KAMALOV, B. A. Sovremennoye oledeniye i stok s lednikov v bassejne Syrdar'i [Present-day glaciation and discharge from glaciers in the Syr-Dar'ya basin]. *Sredneaziatskiy Regional'nyy Nauchno-Issledovatel'skiy Gidrometeorologicheskii Institut. Trudy*, Vyp. 12 (93), 1974, 80 p. [Surveys glaciers of region and describes methods of measuring run-off and its contribution to river water.]
- KEMMERIKH, A. O. Rezhim stoka lednikovykh rek Vanch i Abdukagor [Regime of run-off of the glacial rivers Vanch and Abdukagor]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 198-203. [Pamir. English summary, p. 203.]
- KNIZHNIKOV, YU. F., and RUMYANTSEV, D. G. O vozmozhnosti ispol'zovaniya tsifrovyykh fotogrammetricheskikh modeli dlya izucheniya izmeneniya prostranstvennogo polozheniya lednikov [Utilization of digit photogrammetrical models for the study of glacier dynamics]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 88-90. [English summary, p. 90.]
- KOERNER, R. M., and PATERSON, W. S. B. Analysis of a core through the Meighen Ice Cap, Arctic Canada, and its paleoclimatic implications. *Quaternary Research*, Vol. 4, No. 3, 1974, p. 253-63. [Suggests outline of ice cap's history from analyses of crystal size, bubble content, oxygen isotope ratio, electrical conductivity, and distribution of firn and dirt layers in 121.2 m long core from surface to bedrock.]
- KOTLYAKOV, V. M., and DOLGUSHIN, L. D. Possibility of artificial augmentation of melting by surface dusting of glaciers (results of Soviet investigations). (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, ... 1972. ... 1973, Vol. 2, p. 1421-26.) [Crushed coal and slag or sand and coal gave good results if applied 1½ to 2 months before natural melting. Dusting rates of 200-400 g/m<sup>2</sup> will lower surface albedo to 0.15-0.20.]
- KOVACS, A., and ABELE, G. Crevasse detection using an impulse radar system. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 177-78. [System detected crevasses or cracks at least 3 m ahead or to the side of the antenna. Suggests how this may be extended.]
- KRAUS, H. Energy exchange at air-ice interface. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, ... 1972. ... 1973, Vol. 1, p. 128-64.) [Presents two energy exchange models, one regarding only the processes in the Prandtl layer, the other considering the whole planetary boundary layer. Discussion, p. 162-64.]
- KRENKE, A. N., and KHOVANSKIY, G. S. Raschyot protyazhennosti zon l'dobrazovaniya na lednikakh v nestatsionarnyykh usloviyakh [Calculation of duration of glacier formation zones on glaciers under non-steady conditions]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 25-34. [Deals with transformation of firn into ice. English summary, p. 34.]
- KRENKE, A. N., and ROTOTAYEV, K. P. A surge of the Kolka glacier and its hydrometeorological consequences. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, ... 1972. ... 1973, Vol. 2, p. 1160-71.) [Describes 1969 surge. Discussion, p. 1171.]
- KRIMMEL, R. M., and others. Water flow through a temperate glacier, [by] R. M. Krimmel, W. V. Tangborn and M. F. Meier. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, ... 1972. ... 1973, Vol. 1, p. 401-16.) [Velocities in snow-pack were 0.1 m/h, from snow surface to terminus 6-27 m/h, and from moulins and marginal streams 266-2 450 m/h. Speed affected by snow depth and season.]
- KUDRYASHOV, B. B., and others. Opyt bureniya ledyanogo pokrova Antarktidi [Drilling of the Antarctic ice sheet]. [By] B. B. Kudryashov, V. F. Fisenko, G. K. Stepanov, N. Ye. Bobin. *Antarktika. Doklady Komisii*, Vyp. 12, 1973, p. 145-52.
- KUHN, M. Anisotropic reflection from sastrugi fields. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 123-25. [Classification of parameters causing variations in albedo of the inland ice at the South Pole.]
- LEBEDEVA, I. M. Abyatsiya gornyykh lednikov v usloviyakh kontinental'nogo klimata [Ablation of mountain glaciers in continental climatic conditions]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 101-07. [Main factor affecting ablation in continental areas is solar radiation; this and other factors are discussed. English summary, p. 107.]
- LIEBERT, J., and LEONHARDT, G. Astronomicheskiye nablyudeniya s tsel'yu opredeleniya dvizheniya lednikovogo



- pokrova v rayone stantsii Vostok [Astronomical observations to determine ice-sheet movement in the "Vostok" area]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 88, 1974, p. 68-70.
- LLIBOUTRY, L. A. Lois de frottement d'un glacier sur son lit. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences* (Paris), Sér. D, Tom. 279, No. 5, 1974, p. 389-91. [Discusses laws of friction of a glacier on its bed.]
- MACHERET, YU. YA., and LUCHININOV, V. S. Interpretatsiya rezul'tatov kontaktnoy radiolokatsionnoy s'yemki teplykh gornyykh lednikov [Interpretation of the results of radio-echo sounding of temperate glaciers]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 45-57. [Describes method of interpretation which has been applied to data from Lednik Bezenqi, Caucasus. English summary, p. 57.]
- MACHERET, YU. YA., and others. Ob interpretatsii rezul'tatov gravimetricheskikh izmereniy na gornyykh lednikakh [On the interpretation of the results obtained by gravimetric measurement of mountain glaciers]. [By] Yu. Ya. Macheret, S. A. Ushakov, O. G. Sheremet. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 65-70. [Discusses difficulty of obtaining accurate results. English summary, p. 70.]
- McSAVENEY, M. J. Buckling of the Meserve Glacier surface. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 164-66. [Results of re-measuring ablation and strain network (first measured in January 1972) in field study of formation of surface-wave ogives on glacier in Wright Valley, Antarctica.]
- McSAVENEY, M. J. A 3.1-meter recession of Meserve Glacier, Wright Valley. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 166-67. [1974 measurement shows retreat of ice cliff margin since January 1966.]
- MAKAREVICH, K. G. Gryazekamennyy potok s lednika Tuyuksu [Mudflow from Lednik Tuyuksu]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 197-98. [In Zailiyskiy Alatau, Kazakhskaya A.S.S.R.]
- MEIER, M. F. Hydraulics and hydrology of glaciers. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, ... 1972. ... 1973*, Vol. 1, p. 353-70.) [Review of current knowledge. Discussion, p. 369-70.]
- MEIER, S. Abschluss der Feldarbeiten am Hays-Gletscher, Enderby-Land, Antarktis. *Petermanns Geographische Mitteilungen*, Jahrg. 117, Quartalsht. 4, 1973, p. 267. [Presents briefly some results from 1972-73 season of field work at Hays Glacier, Enderby Land, Antarctica.]
- MEIER, S. Über Kovarianzfunktion der Eisbewegung. *Polarforschung*, Jahrg. 44, Nr. 1, 1974, p. 35-46. [Mathematical analysis of movement of typical ice masses such as outlet glacier, shore ice, ice shelf, ice sheet.]
- MILLER, M. M., and ANDERSON, J. H. Alaskan Glacier Commemorative Project, phase IV: Pleistocene-Holocene sequences in the Alaska-Canada Boundary Range. *National Geographic Society Research Reports*, 1967 projects, 1974, p. 197-223. [Deals with problem of out-of-phase glacio-climatic fluctuations in the maritime versus continental sectors of this cordilleran region, within framework of secular trends over past 11 000 years.]
- NAKAWO, M. Ice fabric studies on a 75 m-long core drilled at Mizuho camp, east Antarctica. *Nankyoku Shiryo: Antarctic Record*, No. 50, 1974, p. 29-34. [Density increased with depth and average grain size was almost constant down to 35 m, when it began to increase sharply. At depths less than 35 m, directions of *c*-axis were almost vertical, while fabric patterns for deeper samples showed a girdle pattern.]
- NEKRASOV, I. A., and others. Glyatsiologicheskiye issledovaniya v khrebet Ulakhan-Chistayskiy (gornaya sistema Cherskogo) [Glaciological studies of Khrebet Ulakhan-Chistay (Khrebet Cherskogo region)]. [By] I. A. Nekrasov, I. V. Klimovskiy, V. S. Sheynkman. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 174-80. [Describes appearance and regime of glaciers in this southern part of Yakutskaya A.S.S.R. English summary, p. 180.]
- NICOL, G. First steps on a glacier. *Geographical Magazine*, Vol. 47, No. 2, 1974, p. 89-90. [Visit as tourist to Østerdalsisen, north Norway.]
- OMMANNEY, C. S. L. The I.H.D. world glacier inventory. (In Sænteford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. ... Washington, D.C., National Academy of Sciences, 1974*, p. 204-12.) [Progress reviewed and aspects requiring new or improved techniques discussed.]
- ØSTREM, G. Runoff forecasts for highly glacierized basins. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, ... 1972. ... 1973*, Vol. 2, p. 1111-32.) [Review of present situation, describing models that give reliable results 1 to 3 days in advance. Discussion, p. 1130-32.]
- PANOV, V. D. Vliyaniye degradatsii oledeneniya na stok rek Severnogo Kavkaza [Effect of glacier shrinkage on river run-off in the northern Caucasus]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 126-30. [Since 1881, the glacierized area of the north Caucasus within the Kuban' and Terek river basins has decreased by over 36%, resulting in considerably decreased run-off. English summary, p. 129-30.]
- PANOV, V. D., and PSAREVA, T. V. Basseyn r. Chegem, [by] V. D. Panov.—Basseyn r. Cherek, [by] V. D. Panov, T. V. Psareva [Basin of the river Chegem, [by] V. D. Panov.—Basin of the river Cherek, [by] V. D. Panov, T. V. Psareva]. *Katalog lednikov SSSR [Catalogue of glaciers of the U.S.S.R.]*, Tom 8, Chast' 6-7, 1973, [96] p. [Part of I.H.D. catalogue giving details of what is known of glaciers in this part of northern Caucasia. The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR [Surface water resources of the U.S.S.R.]*.]
- PANTALEO, M. Bibliografia analitica dei ghiacciai italiani nelle pubblicazioni del C.G.I. *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 21, Supplemento, 1973, 127 p. [Bibliography of Italian glaciers mentioned in the publications of the Comitato Glaciologico Italiano from 1914 to 1972.]
- POGGI, A. Bilan thermique du glacier Ampère à Kerguelen. Étude préliminaire. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, ... 1972. ... 1973*, Vol. 1, p. 187-200.) [Measured ablation was  $6 \pm 2$  cm in 24 h and calculated ablation was  $5.9 \pm 0.5$  cm. Discussion, p. 200.]



- PROKOPOVA, N. P., and FATEYEV, V. P. Basseyn r. Atbashi [Basin of the river Atbashi]. *Katalog lednikov SSSR* [Catalogue of glaciers of the U.S.S.R.], Tom 14, Vyp. 1, Chast' 6, 1973, 48 p. [Part of I.H.D. catalogue giving details of what is known of glaciers in this part of Central Asia (Syr-Dar'ya). The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR* [Surface water resources of the U.S.S.R.].]
- REID, I. A. Glacier surveys by the Water Survey of Canada. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 2, p. 1133-43.) [Traces survey work from its inception in 1945, and summarizes results of two methods for determining average contribution of a glacier to stream flow.]
- REVIYAKIN, V. S., and others. Opyt kompleksnogo raschleneniya snezhno-firnovoy tolshchi lednika [A stratigraphic study of a snow-firn layer in a glacier]. [By] V. S. Reviyakin, V. G. Ivanov, R. P. Meshcheryakov, Ye. S. Solodovnikov, V. P. Tyryshkanov, P. A. Udodov. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 82-87. [Pollen, isotopic and hydrochemical methods used on Lednik Tomich, Altay. English summary, p. 87.]
- ROBIN, G. DE Q. Ice shelves and ice flow. *Nature*, Vol. 253, No. 5488, 1975, p. 168-72. [Radic-echo measurements over Ross Ice Shelf used to deduce ice velocity and hence momentum of ice streams feeding it.]
- RUNDLE, A. S. Glaciology of the Marr ice piedmont, Anvers Island, Antarctica. *Ohio State University. Institute of Polar Studies. Report No. 47*, 1973, xvi, 237 p. [Presents results of a comprehensive three-year study of the features of the piedmont.]
- SCHAEFER, T. G. Radio echo sounding in western Dronning Maud Land, 1971. *South African Journal of Antarctic Research*, No. 3, 1973, p. 45-52. [Presents results of first year's work. Scott Polar Research Institute Mark II echo sounder used.]
- SCHWARTZ, K. Advance and retreat of alpine glaciers. *Alpine Journal*, Vol. 79, No. 323, 1974, p. 74-86. [European Alps. Outlines factors affecting behaviour of glaciers, and some of the results of these fluctuations.]
- SERGIN, V. YA., and STRUKOV, B. S. Peredatochnyye funktsii lednikovyykh pokrovov [Transfer functions of ice sheets]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 78-83. [Study based on axisymmetrical equations of motion of a viscous incompressible liquid under conditions of sticking and sliding along the bed. English summary, p. 83.]
- SHUL'TS, V. L., and SUSLOV, V. F., ed. Glyatsiologiya Sredney Azii. Ledniki [Glaciology of Central Asia. Glaciers]. *Sredneaziatskiy Regional'nyy Nauchno-Issledovatel'skiy Gidrometeorologicheskii Institut. Trudy*, Vyp. 14 (95), 1974, 158 p. [Includes articles on present-day glaciation of Central Asia, problems of fluctuation and movement of glaciers, and mass and energy balance of glaciers.]
- STRETEN, N. A., and others. Some observations of the local wind regime on an Alaskan Arctic glacier, [by] N. A. Streten, N. Ishikawa and G. Wendler. *Archiv für Meteorologie, Geophysik und Bioklimatologie*, Ser. B, Vol. 22, No. 4, 1974, p. 338-50. [Presents conclusions drawn from study of down-slope winds on McCall Glacier, mean slope 7°.]
- SYSENKO, V. I., and others. Basseyny pravyykh pritokov r. Naryna ot ust'ya r. Kyekyemerena do ust'ya r. Malogo Naryna o [Basins of right-bank tributaries of the river Naryn from the mouth of the river Kyekyemerena to the mouth of the river Malyy Naryn]. [By] V. I. Sysenko, Yu. P. Barbat, L. G. Cherkasov. *Katalog lednikov SSSR* [Catalogue of glaciers of the U.S.S.R.], Tom 14, Vyp. 1, Chast' 4, 1973, [59] p. [Part of I.H.D. catalogue giving details of what is known of glaciers in this part of Central Asia (Syr-Dar'ya). The Tom and Vyp. numbers correspond with those of *Resursy poverkhnostnykh vod SSSR* [Surface water resources of the U.S.S.R.].]
- SYTINSKIY, A. D., and OBORINA, S. F. O godovom khode intensivnosti dinamicheskikh protsessov v krayevoy zone lednikovogo pokrova Antarktity po seymicheskim nablyudeniyam v Mirnom [Annual variations of the intensity of dynamic processes in the edge zone of the Antarctic ice sheet as shown by seismic data at Mirny]. *Antarktika. Doklady Komissii*, Vyp. 12, 1973, p. 140-44.
- TEWARI, A. P. Recent changes in the position of the snout of the Pindari glacier (Kumaon Himalaya), Almora district, Uttar Pradesh, India. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 2, p. 1144-49.) [Further retreat of glacier observed in 1966 since last survey in 1958.]
- THOMPSON, R. D., and KELLS, B. R. Mass balance studies on the Whakapapanui Glacier, New Zealand. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 1, p. 383-93.) [Net gain of firn in 1968-69 for the first time in 20 years. Discussion, p. 393.]
- TRONOV, M. V. Novyye teoreticheskiye rezul'taty lednikovyykh issledovaniy na Altaye [New theoretical results of glacier studies in the Altay]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 96-101. [General theoretical discussion based on data from Altay. English summary, p. 100-01.]
- TRONOV, M. V., and others. Glyatsioidrometeorologiya reprezentativnogo gorno-lednikovogo basseyna Aktru. Itogi i perspektivy [Glacioidrometeorology of the representative mountain glacier basin Aktru. Results and prospects]. [By] M. V. Tronov [and 6 others]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 137-42. [General description of Aktru glacier basin, Altayskiy Kray. English summary, p. 142.]
- UVAROV, N. N., and PUTIKOV, O. F. Zadachi geofizicheskikh metodov issledovaniy v skvazhinakh v lednikovom pokrove Antarktity [Problems of geophysical research in bore holes in the Antarctic ice sheet]. *Antarktika. Doklady Komissii*, Vyp. 13, 1974, p. 157-60. [Physical properties and dynamics of ice studied at Vostok.]
- VANESYAN, V. K. Ledniki massiva Aragats i snezhniki Zangezurskogo khrebtka kak reguliruyushchiye faktory vnutrigodovogo raspredeleniya stoka [Glaciers of the Aragats mountain region and snow-patches of the Zangezurskiy Khrebet as regulators of the annual distribution of run-off]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 168-74. [Describes glaciers and snow-patches of this region of the Caucasus, and discusses their role in seasonal run-off. English summary, p. 174.]
- VILENSKIY, V. D., and KOROLEVA, N. I. Soderzhaniye khlorida v lednikovom pokrove Antarktity [Chloride



- content in the Antarctic ice sheet]. *Antarktika. Doklady Komissii*, Vyp. 13, 1974, p. 147-56. [Variations between coastal and interior regions.]
- VINOGRADOV, O. N., and GARELIK, I. S. Skorosti dvizheniya i deformatsii l'da lednikov Kavkaza [Velocities of movement and strain rates of Caucasian glaciers]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 152-63. [English summary, p. 162-63.]
- VOLOSHINA, A. P., and others. Osnovnyye polozheniya po organizatsii i provedeniyu nablyudenyi za kolebaniyami lednikov [Basic premises of organizing observations of glaciers variations]. [By] A. P. Voloshina [and 6 others]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 199-222. [Numerous factors considered and discussed.]
- VYALOV, S. S. Reologiya l'da [Rheology of ice]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 39-44. [Discusses factors affecting flow of ice and presents formulae describing processes. English summary, p. 44.]
- WEERTMAN, J. Stability of Antarctic ice. *Nature*, Vol. 253, No. 5488, 1975, p. 159. [Discusses stability of west Antarctic ice sheet in light of present knowledge and new data, also problem of why ice streams form.]
- WENDLER, G., and others. Hydrology of a partly glacier-covered Arctic watershed, [by] G. Wendler, D. C. Trabandt and C. S. Benson. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 1, p. 417-34.) [Some of the hydrological characteristics of McCall Glacier watershed, Alaska, and the combined water and ice balance for two periods in summers 1969 and 1970 are compared. Discussion, p. 434.]
- WHILLANS, I. M., and THOMPSON, L. G. Glaciological studies along Byrd station strain network. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 167-68. [Presents results on ice regime of upper Marie Byrd Land and on effect of climatic variations on the ice sheet at present and during the recent tens of thousands of years.]
- ZOTIKOV, I. A., and MOISEYEVA, G. P. A theoretical study of ice surface dusting influence on melting intensity. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 2, p. 1410-20.) [Theory and experiments show agreement. Discussion, p. 1420.]
- ZYL, R. B. VAN. Radio echo sounding in western Dronning Maud Land, 1972. *South African Journal of Antarctic Research*, No. 3, 1974, p. 53-59. [Results presented.]

## ICEBERGS. SEA, RIVER AND LAKE ICE

- AIRAKSINEN, K. Free beam tests and friction tests at Pond Inlet, N.W.T. *Polarforschung*, Jahrg. 44, Nr. 1, 1974, p. 71-75. [Measurement of flexural strength of sea ice cover and friction coefficient of ice surface against steel in order to obtain information on resistance to ice of ships' hulls.]
- ANTONOV, V. S., and IVANOV, V. V., ed. Raschety gidrologicheskogo rezhima ust'ev rek arkticheskoy zony Sibiri [Calculation of the hydrological regime of river mouths of the Siberian Arctic zone]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 308, 1974, [192] p. [Articles on forecasting water and ice regimes of these rivers.]
- ANTONOV, V. S., and others. Types of breakup of rivers in Siberian Arctic and sub-Arctic zones, [by] V. S. Antonov, V. V. Ivanov and Yu. V. Nalimov. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 1, p. 541-46.) [Four types of break-up are described, with examples from Siberia.]
- APPEL' I. L., and GUDKOVICH, Z. M. Uchet vzaimodeystviya lednyankh poley v gidrodinamicheskoy modeli dreyfa l'da [Consideration of the interaction between ice fields in hydrodynamic models of ice drift]. *Problemy Arktiki i Antarktiki*, Vyp. 43-44, 1974, p. 92-98. [Based on study of Arctic sea ice.]
- ARDEN, R. S., and WIGLE, T. E. Dynamics of ice formation in the upper Niagara River. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 2, p. 1296-1313.) [Describes characteristics of ice formation in this river from observations over five winters. Discussion, p. 1313.]
- ASVALL, R. P. Changes in ice conditions in regulated river basins. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 2, p. 1283-95.) [Describes factors to be considered in predicting changes in ice conditions in a river basin caused by water power development. Discussion, p. 1294-95.]
- BARNES, J. C., and others. Application of satellite visible and infrared data to mapping sea ice, [by] J. C. Barnes, C. J. Bowley, D. T. Chang, J. H. Willand. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 467-76.) [Discusses ice features mapped in eastern Beaufort Sea and Bering Sea in spring 1973.]
- BELYAKOV, L. N. Gidromekhanicheskiye osobennosti podlednogo sloya (po eksperimental'nym dannym) [Hydro-mechanical features of the sub-ice layer (from experimental data)]. *Problemy Arktiki i Antarktiki*, Vyp. 43-44, 1974, p. 147-52. [Based on research in Arctic Ocean.]
- BOTNIKOV, V. N., and KOROTKEVICH, YE. S. Osobennosti raspredeleniya l'da v Ballenskom ledyanom massive v yanvare-aprele 1972 g. [Peculiarities of ice distribution in the Balleny ice cluster in January-April 1972]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 88, 1974, p. 42-46. [Sea ice affecting approach to "Leningradskaya".]
- BOTNIKOV, V. N., and KOROTKEVICH, YE. S. Raspredeleniye morskikh l'dov v rayone poberezh'ya Zemli Meri Byrd v yanvare-marte 1972 g. [Sea ice distribution along the Marie Byrd Land coastal region in January-March 1972]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 88, 1974, p. 37-41.
- BROWMAN, L. G. Channels in ice. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 224-34.)



- [Study of fresh-water mountain lake shows that formation of slush between ice cover and overlying dry snow is due to minute channels in the ice, and this is a temperature-dependent phenomenon.]
- BUKATOV, A. YE., and CHERKESOV, L. V. Vliyanie ledyanogo pokrova na vnutrenniye volny, generiruyemye atmosferyimi vozmushcheniyami v nepreryvno stratifitsirovannom more [Influence of ice cover on internal waves generated by atmospheric disturbances in a continuously stratified sea]. *Problemy Arktiki i Antarktiki*, Vyp. 43-44, 1974, p. 106-111.
- CAMPBELL, K. J., and ORANGE, A. S. The electrical anisotropy of sea ice in the horizontal plane. *Journal of Geophysical Research*, Vol. 79, No. 33, 1974, p. 5059-63. [Discusses this phenomenon, presenting results from first-year and multi-year ice of thickness 2 cm to 2 m in several areas of the Canadian Arctic.]
- DARBY, D. A., and others. Airborne dust on the Arctic pack ice, its composition and fallout rate, [by] D. A. Darby, L. H. Burckle and D. L. Clark. *Earth and Planetary Science Letters*, Vol. 24, No. 2, 1974, p. 166-72. [Fall-out rates show marked decrease in atmospheric dust from area off Ellesmere Island to sampling stations north of Point Barrow, Alaska, 1 400 km west. Cause discussed.]
- DONCHENKO, R. V. Peculiarities of ice cover formation on reservoirs. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 564-74.) [Discusses freeze-up on reservoirs with reference to examples in the U.S.S.R. Discussion, p. 574.]
- DORONIN, YU. P. Vliyanie ledyanogo pokrova na teploobmen atmosfery s okeanom [Influence of ice cover on heat exchange of atmosphere and ocean]. *Problemy Arktiki i Antarktiki*, Vyp. 43-44, 1974, p. 52-60. [Studies of Arctic Ocean.]
- DORONIN, YU. P., and SYCHEV, V. I. Formirovaniye ledyanogo pokrova kak produkta vzaimodeystviya atmosfery i okeana [Ice cover formation as a product of the interaction between atmosphere and ocean]. *Problemy Arktiki i Antarktiki*, Vyp. 43-44, 1974, p. 18-27. [Calculations based on studies of Arctic sea ice.]
- EHRlich, N. A., and WELSH, J. P. Ice and icebreakers. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . Washington, D.C., National Academy of Sciences, 1974, p. 235-43.) [Describes research activities of U.S. Coast Guard.]
- ENGMANN, J. E. O., and KELLERHALS, R. Transverse mixing in an ice-covered river. *Water Resources Research*, Vol. 10, No. 4, 1974, p. 775-84. [Measures transverse exchange coefficient under ice free and ice cover conditions and determines whether ice cover exerts influence on mixing, which it appears to do.]
- ETTLER, R. E. Statistical analysis of observed iceberg drift. *Arctic*, Vol. 27, No. 2, 1974, p. 121-27. [At low wind speeds, effects of permanent currents, older wind-driven currents and tidal currents predominate over wind drag and new wind-driven currents, whereas at wind speeds over 10 knots, wind has a significant effect on drift.]
- FERGUSON, H. L., and CORK, H. F. Regression equations relating ice conditions in the upper Niagara River to meteorological variables. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 2, p. 1314-27.) [Depending on number of variables employed, as much as 85% of ice flow variance at control dam can be explained. Second set of equations explains as much as 80% of variance in stream flow retardation resulting from anchor ice formation. Discussion, p. 1327.]
- FOULDS, D. M. Modification of ice covers and subsequent runoff by man-made structures. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 2, p. 1436-41.) [Case histories of some Canadian rivers used to illustrate influence of dams, ice booms and hydro-electric power generation on ice cover formation and control of ice movement. Discussion, p. 1441.]
- FUJINO, K., and others. Correction [to "The freezing point of seawater at pressures up to 100 bars"], [by] K. Fujino, E. L. Lewis and R. G. Perkin. *Journal of Geophysical Research*, Vol. 79, No. 30, 1974, p. 4558. [Notes sign error in equation (see *ibid.*, Vol. 79, No. 12, 1974, p. 1792-97).]
- GILFILIAN, R. E., and others. Ice formation in a small Alaskan stream, [by] R. E. Gilfilian, W. L. Kline, T. E. Osterkamp and C. S. Benson. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 505-13.) [Describes observations and measurements performed during freeze-up of Goldstream Creek, near Fairbanks, Alaska. Discussion, p. 513.]
- GINSBERG, B. M. Measurement and forecasting specific to river and lake ice. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 2, p. 1186-95.) [Reviews recent progress. Discussion, p. 1195.]
- GROTHUES-SPORK, H. Aufmessung der Strömungen unter dem Eis des Eclipse Sound (Baffin Island) und Bestimmung von Reibungskoeffizienten zwischen Stahl und Eis. *Polarforschung*, Jahrg. 44, Nr. 1, 1974, p. 76-82. [Presents results of measurements of velocity and direction of current under sea ice in sound and of determination of friction coefficients of ice against steel.]
- GYUL', K. K., and others, ed. *Issledovaniya l'dov yuzhnykh morey SSSR [Ice research of the southern seas of the U.S.S.R.]*. [Edited by] K. K. Gyul', S. I. Kan, V. L. Tsurikov. Moscow, Izdatel'stvo "Nauka", 1973. 128 p. [Articles on ice regime, ice forecasting, applied ice research, and influence of ice conditions on hydrology.]
- HATTENDORFF, H.-G. Beobachtungen der Eisunterfläche und im Eis mit Hilfe einer Unterwasser-Fernschkamera während des Canadian Arctic Channel Project 1972. *Polarforschung*, Jahrg. 44, Nr. 1, 1974, p. 83-88. [Using an underwater television camera, observations and magnetic tape recordings were made in and under the ice of Eclipse Sound. Studies made included ice crystals on wall of drill hole and undersurface ridges.]
- HENGEVELD, H. G. Remote sensing applications in Canadian ice reconnaissance. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . Washington, D.C., National Academy of Sciences, 1974, p. 504-12.) [Summary of problems relating to remote sensing of sea ice in Canadian waters.]
- HIBLER, W. D., III, and MOCK, S. J. Classification of sea ice ridging and surface roughness in the Arctic basin. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*.



- . . . Washington, D.C., National Academy of Sciences, 1974, p. 244-54.) [Reviews one- and two-parameter classification schemes, and examines relationship between ridging intensity and surface roughness spectral characteristics.]
- HUTTER, K. On the significance of Poisson's ratio for floating sea ice. *Mitteilungen der Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie an der Eidgenössischen Technischen Hochschule* (Zürich), Nr. 11, 1974, iii, 78 p. [Investigates influence of temperature profile in ice plates on plate characteristic coefficients for a dynamical theory of flexible plates that accounts for such effects as the variation of Poisson's ratio across the plate thickness.]
- IBCHENKO, V. O., and KHEYSIN, D. YE. Opredeleeniye vnutrennikh napryazheniy v ledyanom pokrove, vozni-kayushchikh pri dreyfa l'da [Measurement of internal strains in ice cover occurring during ice drift]. *Problemy Arktiki i Antarktiki*, Vyp. 43-44, 1974, p. 84-91. [Based on study of Arctic sea ice.]
- KESTER, D. R. Comparison of recent seawater freezing point data. *Journal of Geophysical Research*, Vol. 79, No. 30, 1974, p. 4555-56. [Compares recent investigations and suggests that the effect of pressure should be taken into account.]
- KOVACS, G. Discussion on "Expériences relatives au régime des glaces, acquises en Hongrie" by W. Lászlóffy. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 1, p. 490-95.)
- KOZO, T. L., and TUCKER, W. B. Sea ice bottomside features in the Denmark Strait. *Journal of Geophysical Research*, Vol. 79, No. 30, 1974, p. 4505-11. [Analogue under-ice profile data collected during nuclear submarine transits in Denmark Strait were digitized and analysed in attempt to discover systematic changes in overhead ice character with increasing distance inside seaward ice edge.]
- KRUCHININ, YU. A. Prirodnyaya differentsiatsiya antarkticheskikh shel'fovykh lednikov i yeye faktory [Natural differentiation of Antarctic ice shelves and its factors]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 180-85. [Discusses classification of Antarctic ice shelves. English summary, p. 185.]
- LÁSZLÓFFY, W. Expériences relatives au régime des glaces, acquises en Hongrie. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 1, p. 482-89.) [Discusses formation and behaviour of ice observed on Lake Balaton and on rivers in Hungary.]
- LEONT'YEV, YE. B. Ledovyye usloviya v zalive Pryuds (dekabr' 1971 g.-fevral' 1972 g.) [Ice conditions in Prydz Bay (December 1971-February 1972)]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 88, 1974, p. 47-49.
- LEVKOV, N. P., and CHERKESOV, L. V. O vliyaniy ledyanogo pokrova na elementy dlennykh voln v dvukhsloynnoy vyzkoy zhidkosti [Influence of ice cover on the elements of long waves in a two-layered viscous fluid]. *Problemy Arktiki i Antarktiki*, Vyp. 43-44, 1974, p. 112-18.
- LIST, R., and BARRIE, L. A. Heat losses and synoptic patterns relating to frazil ice production in the Niagara River. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 2, p. 1328-38.) [Presents results of investigation into factors affecting frazil ice formation. Discussion, p. 1337-38.]
- MARKHAM, W. E. Modern demands on the Canadian ice advisory service. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . Washington, D.C., National Academy of Sciences, 1974, p. 370-75.) [Discusses new developments in sea ice reconnaissance and forecasting.]
- MARTIN, S., and KAUFFMAN, P. The evolution of under-ice melt ponds, or double diffusion at the freezing point. *Journal of Fluid Mechanics*, Vol. 64, Pt. 3, 1974, p. 507-27. [Describes experimental and theoretical study, modelling phenomenon observed in summer Arctic, where fresh-water layer at 0°C floats both over sea-water layer at its freezing point and under an ice layer.]
- MEDCOF, J. C., and THOMAS, M. L. H. Surfacing on ice of frozen-in marine bottom materials. *Journal of the Fisheries Research Board of Canada*, Vol. 31, No. 7, 1974, p. 1195-1200. [Benthic material observed in patches on surface of thick fast ice paralleling the shores of estuaries in Canada, particularly the southern Gulf of St. Lawrence. Compares phenomena, and conditions favouring occurrence, here and in Antarctica.]
- MENELEY, W. A. Blackstrap Lake ice cover parking lot. *Canadian Geotechnical Journal*, Vol. 11, No. 4, 1974, p. 490-508. [Describes geotechnical measurements made to ensure safety of parking area on which over 4 000 cars were accommodated.]
- MICHEL, B. Properties and processes of river and lake ice. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 1, p. 454-81.) [Deals with various mechanisms of formation of river and lake ice, effect of ice cover, and various mechanisms of break-up as they influence hydrological phenomena. Discussion, p. 479-81.]
- MICHEL, B., and BÉRENGER, D. L'hiver glaciologique le long du Fleuve St-Laurent. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 2, p. 1251-82.) [Deals with glaciological characteristics of the Canadian winter in the Gulf of St. Lawrence and its valley and especially with ice freeze-up and break-up.]
- MICHEL, B., and others. Ice bridges of the James Bay project, [by] B. Michel and M. Drouin, L. M. Lefebvre, P. Rosenberg and R. Murray. *Canadian Geotechnical Journal*, Vol. 11, No. 4, 1974, p. 599-619. [Reports on bearing capacity theory, design, site selection, construction and testing of ice bridges, which spanned eight rivers.]
- ORADOVSKIY, S. G. Issledovaniye kimicheskogo sostava morskikh antarkticheskikh l'dov [Study of the chemical composition of Antarctic sea ice]. *Okeanologiya*, Tom 14, Vyp. 1, 1974, p. 64-70. [Concentrations of various radicals, salinity and pH of various layers measured. Chlorophyll analysis.]
- ORVIC, S. K probleme transformatsii vozdushnoy massy nad polyn'yami [The problem of transformation of the air mass over polynyas]. *Problemy Arktiki i Antarktiki*, Vyp. 43-44, 1974, p. 161-65. [Based on research in waters of the Canadian Arctic.]



- PAULSON, C. A., and UNTERSTEINER, N. Comment on "On wind profiles over sea ice" by M. P. Langleben. *Geophysical Research Letters*, Vol. 1, No. 7, 1974, p. 313-14. [Criticism of paper, *ibid.*, Vol. 1, No. 2, 1974, p. 82-85, with reply by Langleben, p. 315.]
- PELLETIER, B. R., and SHEARER, J. M. Sea bottom scouring in the Beaufort Sea of the Arctic Ocean. *Collected Contributions of the Bedford Institute of Oceanography*, Vol. 5, 1972, p. 154-64. [Discusses churning and scouring by ice islands and pressure ridges under sea ice as they scrape the ocean bottom.]
- PIOTROVICH, V. V., and DERYUGIN, A. G. Computation of crystal and snow ice accretion in reservoirs from meteorological data. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 2, p. 1202-11.) [Presents formulae for computing ice accretion on the lower surface of the ice, taking into account various parameters.]
- QUINN, F. H. Ice information collection, dissemination and uses on the Great Lakes. (In Santeford, H. S., and Smith, J. L., *comp. Advanced concepts and techniques in the study of snow and ice resources*. . . Washington, D.C., National Academy of Sciences, 1974, p. 363-69.) [General description of activities carried out by, mainly, U.S. government agencies.]
- RODEWALD, M. Die Trend-Umkehr der Eisberg-Häufigkeit bei Neufundland. *Wetterlotse*, Jahrg. 26, Nr. 329-30, 1974, p. 93-96. [Variations in number of icebergs crossing latitude 48° N. in North Atlantic Ocean east of Newfoundland during this century.]
- RUSSELL, B. E. Ice formation in Lake Erie and the Niagara River, its effects and control. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 2, p. 1442-63.) [Discusses operation of ice boom, efficacy in inhibiting ice movement out of lake and studies of effects of boom on ice accumulation and dissipation in lake. Discussion, p. 1463.]
- SADLER, H. E. On a polynya in Makinson Inlet. *Arctic*, Vol. 27, No. 2, 1974, p. 157-59. [Observations made in May 1973, Ellesmere Island, N.W.T.]
- SHORT, A. D., and WISEMAN, W. J., jr. Freezeup processes on Arctic beaches. *Arctic*, Vol. 27, No. 3, 1974, p. 215-24. [Sequence of events noted, also effects of waves, winds and storms.]
- SMETANNIKOVA, A. V., and TEYTEL'BAUM, K. A. Ispol'zovaniye chislennoy skhemy rascheta dlya modelirovaniya osenne-zimnikh ledovykh yavleniy v Arkticheskikh moryakh [Use of a numerical scheme of calculation for modelling of autumn-winter ice phenomena in Arctic seas]. *Problemy Arktiki i Antarktiki*, Vyp. 43-44, 1974, p. 99-105. [Ice movement.]
- STRILAEFF, P. W. Measurement of discharge under ice cover. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 1, p. 797-813.) [Discusses problems involved in this measurement, with reference to experiences in northern Canada. Discussion, p. 812-13.]
- TCHERNIA, P. Étude de la dérive antarctique Est-Ouest au moyen d'icebergs suivis par le satellite *Éole*. *Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences (Paris)*, Sér. B, Tom. 278, No. 14, 1974, p. 667-70. [East-west drift of tabular icebergs in Antarctic waters tracked by means of satellite for 300 days over a distance of 2 000 miles.]
- TIMOKHOV, L. A., ed. Dinamika ledyanogo pokrova [Dynamics of floating ice]. *Trudy Arkticheskogo i Antarkticheskogo Nauchno-Issledovatel'skogo Instituta*, Tom 316, 1974, 218 p. [Articles dealing with Arctic sea ice and with mathematical theory of floating ice.]
- TSANG, G., and SZUCS, L. Field experiments of winter flow in natural rivers. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 1, p. 772-96.) [Describes reactions of natural watercourse to effects of ice cover formation, growth and deterioration, determining parameters affecting rivers in cold weather. Discussion, p. 796.]
- TSURIKOV, V. L. Statisticheskiye kharakteristiki solevogo sostava morskogo l'da [Statistical characteristics of salt composition of sea ice]. *Okeanologiya*, Tom 14, Vyp. 3, 1974, p. 439-47. [English summary, p. 447.]
- TYWONIUK, N., and FOWLER, J. L. Winter measurements of suspended sediments. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 1, p. 814-27.) [Reviews measurement techniques used on Canadian prairie watercourses, difficulties related to presence of ice cover in winter, and methods of overcoming these. Discussion, p. 826-27.]
- VILENSKIY, V. D., and KOROLEVA, N. I. Soderzhaniye sul'fata v lednikovom pokrove Antarktidi [Sulphate content of the Antarctic ice sheet]. *Antarktika. Doklady Komissii*, Vyp. 12, 1973, p. 94-101.
- WALKER, H. J. Salinity changes in the Colville River delta, Alaska, during breakup. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 1, p. 514-27.) [Replacement of sea water by fresh water occurs with little mixing and interface is well delineated. Volume of sea water replaced can thus be determined. Discussion, p. 527.]
- WEEKS, W. F., and DINGMAN, S. L. Thermal modification of river ice covers: progress and problems. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 2, p. 1427-35.) [Possible to estimate water temperatures below thermal pollution sites, but prediction of time dependent behaviour of ice cover below artificially induced ice-free reaches is poor.]
- WEEKS, W. F., and others. Sea ice: scales, problems and requirements, [by] W. F. Weeks, W. D. Hibler III, S. F. Ackley. (In Santeford, H. S., and Smith, J. L., *comp. Advanced concepts and techniques in the study of snow and ice resources*. . . Washington, D.C., National Academy of Sciences, 1974, p. 255-67.) [Discusses some of the problems confronting investigators concerned with the study of sea ice.]
- WILLIAMS, G. P. A case history of forecasting frazil ice. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . 1973, Vol. 2, p. 1212-23.) [Twenty years' records of blockage of intake racks by frazil ice at power plants on the Ottawa River were examined to define weather conditions and heat losses under which frazil ice occurred. Discussion, p. 1222-23.]
- YEFREMOVA, N. D. Short-range forecasting of floating ice on rivers, lakes, and reservoirs. (In [International



- Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 2, p. 1238-42.) [Based on Shuliakovskiy's method.]
- YESKIN, L. I. O dreyfa l'da v more Kosmonavtov [Ice drift in the "Sea of Cosmonauts"]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 88, 1974, p. 50-51. [Near "Molodezhnaya".]
- ZHDANOV, L. A. Ispol'zovaniye sputnikovoy informatsii dlya analiza ledovoy obstanovki v Antarktike [Use of satellite information in the analysis of ice conditions in the Antarctic]. *Antarktika. Doklady Komissii*, Vyp. 12, 1973, p. 102-19. [Sea ice.]

## GLACIAL GEOLOGY

- ALFORD, D. L. Cirque glaciers of the Colorado Front Range: mesoscale aspects of a glacier environment. *Dissertation Abstracts International*, B, Vol. 34, No. 7, 1974, p. 3341-B. [Mass balance studies on 13 small cirque glaciers leads to concept of "orientation gradient" analogous to "energy of glaciation" of larger glaciers. Abstract of Ph.D. thesis, University of Colorado, 1973. University Microfilms order no. 73-32503.]
- ALLARD, M. Géomorphologie des eskers abitibiens. *Cahiers de Géographie de Québec*, Vol. 18, No. 44, 1974, p. 271-96. [Describes and discusses formation of eskers in Abitibi region of north-western Quebec, Canada.]
- ALLEY, N. F., and HARRIS, S. A. Pleistocene glacial lake sequences in the Foothills, southwestern Alberta. *Canadian Journal of Earth Sciences*, Vol. 11, No. 9, 1974, p. 1220-35. [Describes sequence and extent of lakes, relates lacustrine and fluvio-lacustrine features to sequence, and substantiates stratigraphic evidence for non-synchronicity of Laurentide and Cordilleran ice maxima in south-western Alberta.]
- ASEYEV, A. A. Problemy geomorfologii oblastey drevnikh materikovykh oldedeniy i ikh znacheniy dlya glyatsiologii [Geomorphological problems of areas of former continental glaciers and their role for glaciology]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 83-86. [English summary, p. 86.]
- BALKWILL, H. R., and others. Glacial features and pingos, Amund Ringnes Island, Arctic Archipelago, [by] H. R. Balkwill, K. J. Roy, W. S. Hopkins and W. V. Sliter. *Canadian Journal of Earth Sciences*, Vol. 11, No. 9, 1974, p. 1319-25. [Evidence of Pleistocene glaciation includes striations and grooves in bedrock, striated erratics, and possible eskers and kames. Comments upon unusual cluster of pingos.]
- BEHLING, R. E., and others. Soil and glacial history studies in Wright Valley (revisited), [by] R. E. Behling and J. P. Reger, P. E. Calkin. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 148-49. [Re-examines evidence on alpine glaciations in this region of Antarctica, based on 1973-74 field observations.]
- BELLONI, S. Ricerche lichenometriche in Valfurva e nella Valle di Solda. *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 21, 1973, p. 19-33. [Lichenometric measurements at snout of Solda glacier, Italy, enable position during last 500 years to be determined.]
- BLACK, R. F. Late-Quaternary sea level changes, Umnak Island, Aleutians—their effects on ancient Aleuts and their causes. *Quaternary Research*, Vol. 4, No. 3, 1974, p. 264-81. [Discusses post-glacial radiocarbon-dated ash sequence and describes geologic evidence for sea-level changes. Reviews causes of relative sea-level changes on island (eustatic, tectonic, volcanic, and glacial and water isostatic effects). Discusses effects of late Quaternary sea-level changes on migration and environment of ancient Aleuts.]
- CURL, J. E., and TENBRINK, N. W. Glaciology and glacial chronology in the South Shetland Islands. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 168-71. [Analysis of ice cores should result in complete chronology of glacier and sea-level fluctuations.]
- CURREY, D. R. Probable pre-neoglacial age of the type Temple Lake moraine, Wyoming. *Arctic and Alpine Research*, Vol. 6, No. 3, 1974, p. 293-300. [Evidence includes minimum limiting date of  $6\,500 \pm 230$  <sup>14</sup>C years B.P. from base of bog on type moraine.]
- DANILOV, I. D. Problemy razvitiya polyarnogo shel'fa Yevrazii i yego poberezhnyy v kaynozoye [Problems of the development of Eurasia's polar shelf and its coasts in Cainozoic times]. *Vestnik Moskovskogo Universiteta. Seriya Geografiya*, 1974, No. 1, p. 31-37. [English summary, p. 37.]
- DEMEK, J. Die Klimamorphologie des vulkanischen Gebietes von Changbai-san in der Koreanischen Volksdemokratischen Republik. *Zeitschrift für Geomorphologie, Neue Folge*, Supplementbd. 17, 1973, p. 58-71. [Presents evidence of Pleistocene glaciation in Korea, including observations on corries and moraines.]
- DENTON, G. H. Quaternary glaciations of the White River valley, Alaska, with a regional synthesis for the northern St. Elias Mountains, Alaska and Yukon Territory. *Geological Society of America. Bulletin*, Vol. 85, No. 6, 1974, p. 871-92. [Discusses Quaternary stratigraphy and chronology of area, and suggests climatic implications.]
- DENTON, G. H., and BORNES, H. W., jr. Former grounded ice sheets in the Ross Sea. *Antarctic Journal of the United States*, Vol. 9, No. 4, 1974, p. 167. [Reports work on mapping and dating moraines and erosional features associated with the ice sheet grounded within the last 1.2 million years.]
- DIK, I. P. Drevneye oledeneniye Tokinskogo Stanovika (Yuzhnaya Yakutiya) [Ancient glaciation of Tokinskiy Stanovik (southern Yakutiya)]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya*, 1974, No. 1, p. 96-100. [Quaternary glaciation.]
- ENGLAND, J. A note on the Holocene history of a portion of northernmost Ellesmere Island. *Arctic*, Vol. 27, No. 2, 1974, p. 154-57. [Comments on article by J. B. Lyons and J. E. Mielke, *ibid.*, Vol. 26, No. 4, 1973, p. 314-23.]
- EVANS, I. S., and COX, N. Geomorphometry and the operational definition of cirques. *Area* (Cambridge), Vol. 6, No. 2, 1974, p. 150-53. [Discusses how to define and measure a cirque in the light of recent confusion.]
- FLURI, F. Beiträge zur Geschichte der alpinen Würmvereisung: Forschungen am Bänderton von Baumkirchen (Inntal, Nordtirol). *Zeitschrift für Geomorphologie, Neue Folge*, Supplementbd. 16, 1973, p. 1-14. [Discusses dating of Würm glaciation of the Inn valley, Austria.]



- GROSVAL'D, M. G. Pokrovnnye ledniki morey i ikh rol' v glyatsial'nom morfolitogeneze [Ice sheets of the sea and their role in glacial morpholithogenesis]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 68-77. [During the Cainozoic, nearly half the ice existed as ice shelves or as ice sheets grounded below sea-level. English summary, p. 77.]
- GUSTAVSON, T. C. Fluvial and lacustrine sedimentation in the proglacial environment, Malaspina Glacier foreland, Alaska. *Dissertation Abstracts International*, B, Vol. 34, No. 6, 1973, p. 2714-B. [Description of these varved sediments currently being formed. Abstract of Ph.D. thesis, University of Massachusetts, 1973. University Microfilms order no. 73-22801.]
- HASTENRATH, S. Glaziale und periglaziale Formbildung in Hoch-Semyen, Nord-Äthiopien. *Erdkunde*, Bd. 28, Ht. 3, 1974, p. 176-86. [Presents observations on altitudinal zonation of periglacial phenomena and on moraines and cirques in this mountainous region of Ethiopia.]
- HEUSSER, C. J. Quaternary vegetation, climate, and glaciation of the Hoh River valley, Washington. *Geological Society of America. Bulletin*, Vol. 85, No. 10, 1974, p. 1547-60. [Takes into account palynologic and related studies having to do with recognition and chronology of glacial events, as well as vegetational and climatic changes in valley.]
- IVANOVSKIY, L. N. Rayony drevnego oledeniya i ob'yem l'da pozdnepleystotsenovykh lednikov Altaya [Areas of former glaciation and volume of ice in late Pleistocene glaciers of the Altay]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 130-35. [Presents reconstruction of events. English summary, p. 135.]
- KÁDÁR, L. On Cenozoic and older glaciations. *Geoforum* (Oxford), [No.] 15, 1973, p. 7-13. [Maintains that it is incorrect to speak of glacial and interglacial periods in a global sense, since polar wandering and alterations in intensity of solar radiation and in atmospheric processes influence climatic zones and cause alternation of periglacial and interperiglacial periods in belts round polar ice caps.]
- KARCZEWSKI, A. Structural features of kame forms as an expression of the dynamics of morphogenetic environment. *Questiones Geographicae* (Poznań), [No.] 1, 1974, p. 53-63. [Discusses formation of kames.]
- KIDSON, C., and others. The Burtle Beds of Somerset—glacial or marine? [By] C. Kidson, J. R. Haynes, A. Heyworth. *Nature*, Vol. 251, No. 5472, 1974, p. 211-13. [Presents evidence suggesting marine origin.]
- KOROTUN, I. N. Rekonstruktsiya pozdnepleystotsenovykh i golotsenovykh lednikov v bassejnye reki Baksan (Kavkaz) [On the reconstruction of the late Pleistocene and Holocene glaciers in the river Baksan basin (Caucasus)]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 123-30. [Geomorphological, lichenometrical and dendrochronological studies. English summary, p. 130.]
- KURIMO, H. Virtaviivaiset muodot jäään liikuntojen kuvastajina Posion-Kuusamon alueella [Stream-line features as indications of ice movement in the Posio-Kuusamo area]. *Terra*, Vol. 86, No. 2, 1974, p. 52-61. [North-east Finland. Features include drumlins and fluted surfaces. English abstract, p. 52.]
- LAVROV, A. S. Drevneye oledeniye severo-vostoka russkoy ravniny [Ancient glaciation of the north-east Russian plain]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya*, 1973, No. 6, p. 29-38. [Study of deposits and relief of region as indicators of effects of glaciation.]
- MAYEWSKI, P. A. Glacial geology and late-Cenozoic history of the Trans-Antarctic Mountains, Antarctica. *Dissertation Abstracts International*, B, Vol. 34, No. 8, 1974, p. 3859-B-60-B. [Study of glacial history of Antarctica and estimates of ice volumes at glacial maxima. Abstract of Ph.D. thesis, Ohio State University, 1973. University Microfilms order no. 74-3248.]
- METZ, B., and NOLZEN, H. Neue Ergebnisse aus dem Vorfeld des Grünaufeners (Stubai Alpen/Tirol). Ein Beitrag zur Datierung postglazialer Gletscherhochstände. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 16, 1973, p. 73-89. [Attempt to find evidence for extent of Grünaufener, Austria, during post-Pleistocene readvance.]
- MICKELSON, D. M., and BERKSON, J. M. Till ridges presently forming along above and below sea level in Wachusett Inlet, Glacier Bay, Alaska. *Geografiska Annaler*, Vol. 56A, Nos. 1-2, 1974, p. 111-19. [Describes appearance and composition of till ridges forming along calving margin of Plateau Glacier.]
- MILLER, C. D., and BIRKELAND, P. W. Probable pre-neoglacial age of the type Temple Lake moraine, Wyoming: discussion and additional relative-age data. *Arctic and Alpine Research*, Vol. 6, No. 3, 1974, p. 301-06. [Comments on D. R. Currey's article, *ibid.*, p. 293-300.]
- MYAGKOV, S. M. Istoriya oledeniya dolin Rayta, Teylora i Ferrara (Zemlya Viktorii, Antarktida) [History of the glaciation of the Wright, Taylor and Ferrar valleys (Victoria Land, Antarctica)]. *Antarktika. Doklady Komissii*, Vyp. 13, 1974, p. 5-11.
- PATZELT, G. Die postglazialen Gletscher- und Klimaschwankungen in der Venedigergruppe (Hohe Tauern, Ostalpen). *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 16, 1973, p. 25-72. [Age of post-glacial moraines of valley glaciers in this region of Austria studied in order to correlate glacial and climatic history of region.]
- REINHARD, H. Genese des Nordseeraumes im Quartär. *Fennia*, 129, 1974, 96 p. [Development of North Sea area during Quaternary glaciations.]
- ROTNICKI, K. Slope development of Riss glaciation end moraines during the Würm; its morphological and geological consequences. *Questiones Geographicae* (Poznań), [No.] 1, 1974, p. 109-39. [Slope evolution in Poland.]
- RUDBERG, S. Glacial erosion forms of medium size—a discussion based on four Swedish case studies. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 17, 1973, p. 33-48. [Examples of Pleistocene erosion from west and north-central Sweden.]
- SAARNISTO, M. The deglaciation history of the Lake Superior region and its climatic implications. *Quaternary Research*, Vol. 4, No. 3, 1974, p. 316-39. [Investigation of end moraines and pollen stratigraphy.]
- SCHERMERHORN, L. J. G. Late Precambrian mixtites: glacial and/or nonglacial? *American Journal of Science*, Vol. 274, No. 7, 1974, p. 673-82. [Widespread distribution of mixtites has led to concept of Precambrian



- ice age of such severity that ice caps existed in the present tropics. Theory examined and concluded to be unlikely.]
- SCHERMERHORN, L. J. G. No evidence for glacial origin of late Precambrian tilloids in Angola. *Nature*, Vol. 252, No. 5479, 1974, p. 114-15. [Questions validity of A. Kröner and H. Correia's arguments, *Nature, Physical Science*, Vol. 246, No. 155, 1973, p. 115-17. Reply by Kröner, p. 115-16.]
- SCOTT, R. W. Successional patterns on moraines and outwash of the Frederika Glacier, Alaska. (In Bushnell, V. C., and Marcus, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4.* New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974, p. 319-29.) [Vegetation patterns.]
- SELLEVOLL, M. A., and SUNDVOR, E. The origin of the Norwegian Channel—a discussion based on seismic measurements. *Canadian Journal of Earth Sciences*, Vol. 11, No. 2, 1974, p. 224-31. [Results of survey between 59° 5' and 63° N. show that channel is mainly result of sedimentation and glacial erosion during Quaternary.]
- SEMMELE, A. Periglaziale Umlagerungszonen auf Moränen und Schotterterrassen der letzten Eiszeit im deutschen Alpenvorland. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 17, 1973, p. 118-32. [Describes debris blankets and zones of debris displacement from areas formerly covered by Rhine- and Ammersee-gletscher. Probably originated under periglacial climatic conditions in late glacial period.]
- SHNITNIKOV, A. V. Degradatsiya poslednego oledneniya v kotlovine ozera Chatyrkel' (Tyan'-Shan') [Degradation of the last glaciation in the basin of Ozero Chatyrkel' (Tyan'-Shan')]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 117-23. [Study of moraines shows how glacier in Kirgizskaya S.S.R. retreated, leaving behind present lake. English summary, p. 123.]
- SIGAFOOS, R. S., and HENDRICKS, E. L. Recent activity of glaciers of Mount Rainier, Washington. Botanical evidence of glacier activity. An investigation of the chronology of terminal and lateral moraines of eight glaciers at Mount Rainier, Washington. *U.S. Geological Survey. Professional Paper 387-B*, 1972, vi, 24 p. [Determines ages of young moraines, deposited recently in historical times, by determining ages of trees growing on them.]
- SISSONS, J. B. A late-glacial ice cap in the central Grampians, Scotland. *Institute of British Geographers. Transactions*, No. 62, 1974, p. 95-114. [Evidence obtained to show existence of ice cap of area 300 km<sup>2</sup>, volume 32 km<sup>3</sup>, and average thickness 110 m. Former firn lines determined and inferences made about contemporary temperatures and distribution of precipitation.]
- SOYUZ, D. Studien zur Geomorphologie und zum letztglazialen Eisrückzug in den Gebirgen Süd-Lapplands, Schweden. *Geografiska Annaler*, Vol. 56A, Nos. 1-2, 1974, p. 1-71. [Geomorphology and retreat of ice during late glacial period in southern Lapland mountains.]
- SUROVA, T. G., and others. Razvitiye oledneniya Polyarnogo Urala v pozdnem pleystotsene i golotsene (v svyazi s izucheniym otlozheniy lednikovo-podprudnykh ozer) [On the development of the glaciation of Polyarnyy Ural during the late Pleistocene and Holocene (in connection with the study of glacial lake deposits)]. [By] T. G. Surova, L. S. Troitskiy, Ya.-M. K. Punning. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 61-68. [Study of glacial lakes and moraines formed during the Quaternary enables development of climate, vegetation and glaciation to be followed. English summary, p. 68.]
- TERASMAE, J. Deglaciation of Port Hood Island, Nova Scotia. *Canadian Journal of Earth Sciences*, Vol. 11, No. 10, 1974, p. 1357-65. [Concludes deglaciation occurred more than 11 000 years B.P. No evidence of more recent ice advance found on western Cape Breton Island.]
- TROITSKIY, L. S. Voprosy glyatsial'nogo morfogeneza (po issledovaniyam na Shpitsbergene, Novoy Zemle i Polyarnom Urale) [Problems of glacial morphogenesis (based on studies in Svalbard, Novaya Zemlya and Polyarnyy Ural)]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 105-09. [English summary, p. 109.]
- VELICHKO, A. A., and LEBEDEVA, I. M. Opyt paleoglyatsiologicheskoy rekonstruktsii dlya vostochnogo Pamira [An attempt at a palaeoglaciological reconstruction of the eastern Pamir]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 109-17. [Deals with type, age and climatic conditions of the last glaciation in Tadzhikskaya S.S.R. English summary, p. 117.]
- VELICHKO, A. A., and LEBEDEVA, I. M. Reconstruction of the upper Pleistocene glaciation of east Pamir. *Geoforum (Oxford)*, [No.] 16, 1973, p. 67-74. [Discusses age, type and climatic conditions of glaciation. Suggests maximum occurred 14 000-15 000 years B.P.]
- VINOGRADOV, O. N., and KONOVALOVA, G. I. Problemy glyatsiomorfologicheskogo rayonirovaniya (na primere Tyan'-Shanya) [Problems of defining glaciomorphological regions (with reference to Tyan'-Shan')]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 186-96. [Use of *Katalog lednikov SSSR* to distinguish types of glaciers. English summary, p. 196.]
- WEIDICK, A. Investigations on the Quaternary deposits in the Fiskeneset region, southern west Greenland. *Grønlands Geologiske Undersøgelse. Rapport Nr. 65*, 1974, p. 65.
- YEVTSEYEV, S. A. O glyatsiogeomorfologii Antarktity [On the glaciogeomorphology of the Antarctic]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 87-93. [Review. English summary, p. 93.]

#### FROST ACTION ON ROCKS AND SOIL. FROZEN GROUND. PERMAFROST

- AFANASENKO, V. YE., and others. Gigantskiye naledi v bassejne r. Selennyakh [Gigantic nales in the Selennyakh river basin]. [By] V. Ye. Afanasenko, M. M. Koreyshina, N. N. Romanovskiy. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 210-14. [Regime of this naled studied and results compared with those obtained in 1939. Yakutskaya A.S.S.R. English summary, p. 214.]
- ALEKSEYEV, V. R. Causes and factors of ground-ice formation. *Soviet Geography: Review and Translation*, Vol. 15, No. 7, 1974, p. 395-407. [Discusses causes and factors in light of new definition of ground ice as product of



- layer-by-layer freezing of water of any origin. Translation of *Doklady Instituta Geografii Sibiri i Dal'nego Vostoka*, 1973, No. 39, p. 12-23.]
- BANIN, A., and ANDERSON, D. M. Effects of salt concentration changes during freezing on unfrozen water content of porous materials. *Water Resources Research*, Vol. 10, No. 1, 1974, p. 124-28. [Develops and tests experimentally equations necessary to calculate unfrozen water content in porous bodies containing solutes.]
- BLEICH, K. E. Zur Entstehung der Pingos im Mackenzie Delta, N.W.T. *Polarforschung*, Jahrg. 44, Nr. 1, 1974, p. 60-66. [Describes formation of pingos in this region of Canada.]
- CZUDEK, T. Zur klimatischen Talasymmetrie des Westteiles der Tschechoslowakei. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 17, 1973, p. 49-57. [Asymmetry of valley sides in western Czechoslovakia is largely due to periglacial climatic conditions during Würm glaciation.]
- FROLOV, A. D. O temperaturnoy dispersii dielektricheskikh svoystv l'da i merylykh gruntov [On the temperature dispersion of the dielectric properties of ice and frozen ground]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 56-61. [Dielectric properties well approximated by curves analogous to Cole-Cole diagrams for frequency dispersion, confirming dependence of relaxation characteristics of dielectric properties on temperature of cryogenic formation studied. English summary, p. 60-61.]
- FURRER, G., and FREUND, R. Beobachtungen zum subnivalen Formenschatz am Kilimandjaro. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 16, 1973, p. 180-203. [Discusses needle ice formation and solifluction on Mt Kilimanjaro, East Africa.]
- GAVRILOVA, M. K. Radiation and heat balances, thermal regime of an icing. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 496-504.) [Reports observations on the icing formed annually from freezing of underground fresh water, which forces its way to the surface, in the Ulakhan-Taryn valley, central Yakutiya.]
- GUYMON, G. L., and LUTHIN, J. N. A coupled heat and moisture transport model for Arctic soils. *Water Resources Research*, Vol. 10, No. 5, 1974, p. 995-1001. [Describes development of model of processes in these soils where moisture movement and storage is complicated by water undergoing a phase change during freezing and thawing and by presence of ice-rich permafrost.]
- HARLAN, R. L. Ground conditioning and the groundwater response to surface freezing. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 326-41.) [Presents mathematical model which provides for finite difference solution to one-dimensional, coupled heat-fluid flow problem with freezing and thawing in homogeneous, rigid (non-deforming) porous medium. Discussion, p. 341.]
- HASTENRATH, S. Observations on the periglacial morphology of Mts. Kenya and Kilimanjaro, East Africa. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 16, 1973, p. 161-79. [Includes descriptions of pipkrake, stone stripes and polygons.]
- HEGINBOTTOM, J. A. Some effects of surface disturbance on the permafrost active layer at Inuvik, N.W.T. *Canada. Task Force on Northern Oil Development. Environmental-Social Committee, Northern Pipelines. Report No. 73-16*, 1973, [70] p. [Considers effects of forest fires, removal of trees, and removal of surface vegetation and soil, which has a particularly serious effect, especially in summer.]
- IOFFE, D. YA. O proiskhozhenii Samarovskogo "lednikovogo ottorzhenitsa" [On the origin of the Samarovskiy erratic block]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 214-18. [West Siberian lowland. English summary, p. 218.]
- JOHNSON, P. G. Mass movement of ablation complexes and their relationship to rock glaciers. *Geografiska Annaler*, Vol. 56A, Nos. 1-2, 1974, p. 93-101. [Field evidence in Yukon and literature survey suggests that a wide range of forms which have been identified as rock glaciers should be investigated according to their processes of movement rather than their morphological form.]
- JUDGE, A. S. The thermal regime of the Mackenzie valley: observations of the natural state. *Canada. Task Force on Northern Oil Development. Environment-Social Committee, Northern Pipelines. Report No. 73-38*, 1973, vii, 117 p. [Presents results of precise measurements at various sites.]
- JUMIKIS, A. R. Thermo-osmotic soil moisture transfer upon freezing. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 119-34.) [Discussion and mathematical analysis of phenomenon.]
- JUMIKIS, A. R., and SLUSARCHUK, W. A. Electrical parameters of some frost-prone soils. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 765-81.) [Describes experimental study of electrical parameters of dry and moist soils as function of soil type, porosity, moisture content, frequency, and temperature.]
- KANE, D. L., and SLAUGHTER, C. W. Seasonal regime and hydrological significance of stream icings in central Alaska. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 528-40.) [Describes and discusses formation and behaviour of icings (naleds). Discussion, p. 540.]
- KONSTANINOVA, G. S., and TYRTIKOV, A. P. Ovrashno-termoerozionnyy landschaft morskoy tundrovoy ravniny i yego dinamika [Ravine-type thermo-erosional landscape of the coastal tundra plain and its dynamics]. *Vestnik Moskovskogo Universiteta. Seriya Geografiya*, 1974, No. 1, p. 81-87. [Thermokarst areas along Soviet Arctic shores. English summary, p. 87.]
- KOZARSKI, S. Evidences of late-Würm permafrost occurrence in north-west Poland. *Quaestiones Geographicae* (Poznań), [No.] 1, 1974, p. 65-86. [Describes fossil remains of permafrost features, including ice-wedge casts and sand-wedge polygons.]
- LADANYI, B., and JOHNSTON, G. H. Behavior of circular footings and plate anchors embedded in permafrost. *Canadian Geotechnical Journal*, Vol. 11, No. 4, 1974, p. 531-53. [Develops method for predicting creep settlement and bearing capacity of frozen soils under deep circular loads.]



- LANDRY, B. S. Numerical simulation of geophysical heat transfer in permafrost areas. *Dissertation Abstracts International*, B, Vol. 34, No. 8, 1974, p. 3807-B. [Appraises effects of heat additions to permafrost layers. Abstract of Ph.D. thesis, University of Houston, 1973. University Microfilms order no. 74-2845.]
- MACKAY, J. R. Ice-wedge cracks, Garry Island, Northwest Territories. *Canadian Journal of Earth Sciences*, Vol. 11, No. 10, 1974, p. 1366-83. [Discusses time and geometry of winter ice-wedge cracks during 1967-73. About 40% of ice wedges crack in any given year.]
- MCRROBERTS, E. C., and MORGENSTERN, N. R. Stability of slopes in frozen soil, Mackenzie Valley, N.W.T. *Canadian Geotechnical Journal*, Vol. 11, No. 4, 1974, p. 554-73. [Describes characteristic morphology and soil and permafrost conditions at block and multiple retrogressive landslides associated with shear failure in frozen soil.]
- MCRROBERTS, E. C., and MORGENSTERN, N. R. The stability of thawing slopes. *Canadian Geotechnical Journal*, Vol. 11, No. 4, 1974, p. 447-69. [Describes common thaw-dominated landslide forms, and considers a thaw consolidation model and an ablation model.]
- PEWÉ, T. L. Ice wedge casts and past permafrost distribution in North America. *Geoforum* (Oxford), [No.] 15, 1973, p. 15-25. [Describes how presence of ice-wedge casts shows extent of Quaternary permafrost.]
- PREUSSER, H. Hypsometrischer Formenwandel der Polygone in Island. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 16, 1973, p. 155-60. [Describes types, development and distribution of polygons in Iceland.]
- ROMANOVSKIY, N. N. Naledobrazovaniye v prilednikovoy zone pokrovnykh oledeneniy Yevropy [On the formation of icing in periglacial zones of Europe]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 100-04. [Discusses icing. English summary, p. 104.]
- SCOTT, R. W. Soils and patterned ground in the Chitstone Pass region of Alaska. (In Bushnell, V. C., and Marcus, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4*. New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974, p. 279-82.) [Presents preliminary classification of soils and describes patterned ground observed during alpine vegetation studies.]
- SHARBATYAN, A. A. *Ekstremal'nyye otsenki v geotermii i geokriologii* [Extreme values in geothermy and geocryology]. Moscow, Izdatel'stvo "Nauka", 1974. 122 p. [Includes calculations of thermal properties of frozen ground in northern part of Western Siberia.]
- SMITH, M. W. Factors affecting the distribution of permafrost, Mackenzie Delta. *Dissertation Abstracts International*, B, Vol. 34, No. 12, Pt. 1, 1974, p. 6063-B. [Variations in ground temperature regime and permafrost distribution studied near Inuvik, N.W.T. Abstract of Ph.D. thesis, University of British Columbia. Microfilm copies from National Library of Canada, Ottawa.]
- THIE, J. Distribution and thawing of permafrost in the southern part of the discontinuous permafrost zone in Manitoba. *Arctic*, Vol. 27, No. 3, 1974, p. 189-200. [25% of once occurring permafrost is still present. Peripheral collapse noticed around very small permafrost bodies, central collapse in larger ones. Amount of collapse varied from 0 to 30 m horizontally in 20 years.]
- TOLSTIKHIN, O. N., and SOKOLOV, B. L. Icing mounds as a factor of formation of river and underground runoff in eastern Siberia. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 557-63.) [Presents methods for computing icing alimentation and flow, and evaluates influence of icing process on formation of surface and ground water resources.]
- TROLL, C. Rasenabschälung (turf exfoliation) als periglaziales Phänomen der subpolaren Zonen und der Hochgebirge. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 17, 1973, p. 1-32. [Discusses process of turf exfoliation, caused by freezing and frost-heaving of soil with nightly formation of needle ice, based on observations in Iceland, Îles Kerguelen, and high mountains of various climatic zones.]
- TYRTIKOV, A. P. *Dinamika rastitel'nogo pokrova i razvitiye vechnoy merzloty v Zapadnoy Sibiri* [Dynamics of the vegetation cover and development of permafrost in Western Siberia]. Moscow, Izdatel'stvo Moskovskogo Universiteta, 1974. 198 p.
- U.S. NATIONAL RESEARCH COUNCIL. *Priorities for basic research on permafrost. Ad hoc Study Group on Permafrost, Committee on Polar Research*. Washington, D.C., National Academy of Sciences, 1974. ix, 54 p. [Survey of problems and suggestions for priorities.]
- WHITE, P. G. Rock glaciers in the San Juan Mountains, Colorado. *Dissertation Abstracts International*, B, Vol. 34, No. 10, 1974, p. 5025-B. [Study of relation between rock glaciers and true glaciers shows only connection is that they have occupied the same topography. Rock glaciers are essentially a periglacial and wasting phenomenon. Abstract of Ph.D. thesis, University of Denver, 1973. University Microfilms order no. 74-9234.]
- WICK, P. Fossiles Rieseneisystem in spätglazialen Schottern im vorderen Prättigau (Graubünden/Schweiz). *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 16, 1973, p. 15-24. [Giant fossil ice wedges found in gravel pit, Landquartberg, Prättigau, Switzerland.]
- WORSLEY, P., and HARRIS, C. Evidence for neoglacial solifluction at Okstindan, north Norway. *Arctic*, Vol. 27, No. 2, 1974, p. 128-44. [Radiocarbon dates from buried soils beneath solifluction lobes reveal evidence of soil movement extending over 3 000 years to the present. Suggests movement is linked to late sub-boreal climatic deterioration and neo-glacial glacier expansion which induced development of late-lying snow patch.]

## METEOROLOGICAL AND CLIMATOLOGICAL GLACIOLOGY

- BORISENKOV, YE. P. Nekotoryye problemy chislennogo eksperimentirovaniya vzaimodeystviya atmosfery i okeana s uchetom polyarnykh l'dov [Some problems of numerical experimentation on interaction of atmosphere and ocean taking into account polar ice]. *Problemy Arktiki i Antarktiki*, Vyp. 43-44, 1974, p. 6-17.
- DROZDOV, O. A., and MOSOLOVA, G. I. Korrelyatsii v prostranstve, vo vremeni i v godovom khode, vozmozhnost' ikh ispol'zovaniya v klimatologii i glyatsioklimatologii [Correlations in space, time and annual movement and their use in climatology and glacioclimatology]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 91-95. [English summary, p. 95.]



- HOBBS, P. V. High concentrations of ice particles in a layer cloud. *Nature*, Vol. 251, No. 5477, 1974, p. 694-96. [Letter. Concentrations greatly in excess of ice nucleus measurements found in non-convective cloud layer.]
- KRY, P. R. Aerodynamics of rotating oblate spheroidal hailstone models. *Dissertation Abstracts International*, B, Vol. 35, No. 1, 1974, p. 419-B. [Wind tunnel measurements used to assist theory of free fall of hailstones. Abstract of Ph.D. thesis, University of Toronto, 1973. Microfilm copies from National Library of Canada, Ottawa.]
- LAGERCRANTZ, C.-L. Kilpisjärvitraktens klimat, tjäle och postglaciala klimatutveckling: observationer gjorda 1938-39. *Terra*, Vol. 86, No. 2, 1974, p. 62-67. [Climate, frozen ground and post-glacial climate development at Kilpisjärvi: observations made in Finnish Lapland, 1938-39. English abstract, p. 62.]
- VOLOSHINA, A. P. Metod rascheta klimaticheskikh kharakteristik teplovogo balans a lednikovoy poverkhnosti [Technique of computing the climatic characteristics of the heat balance of a glacier surface]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 108-11. [Mean values of heat exchange components were calculated for anticyclonic, frontal, and convective with and without precipitation types of weather. English summary, p. 111.]
- WENDLER, G., and others. The climate of the McCall Glacier, Brooks Range, Alaska, in relation to its geographical setting. [by] G. Wendler, N. Ishikawa and N. [A.] Streten. *Arctic and Alpine Research*, Vol. 6, No. 3, 1974, p. 307-18. [Data from automatic weather station at altitude 2 275 m differed from those obtained at nearest permanent meteorological stations, particularly in very high precipitation recorded and verified by snow stratigraphy measurements.]
- SNOW
- ALEKSEYEV, G. A., and others. Infiltration of snowmelt water into frozen soil, [by] G. A. Alexeyev [sic], I. L. Kaljuzhny, V. Ya. Kulik, K. K. Pavlova and V. V. Romanov. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 313-25.) [Presents formulae which are compared with results of field experiments.]
- ARMSTRONG, R. L. Avalanche hazard evaluation and prediction in the San Juan Mountains of southwestern Colorado. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 346-55.) [Discusses current research in this area.]
- ÁRNASON, B., and others. Movement of water through snow pack traced by deuterium and tritium, [by] B. Árnason, T. Buason, J. Martinec and P. Theodórsson. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 299-312.) [Isotope concentrations in precipitation, snow-pack and melt water measured to trace movement of water, recrystallization and isotopic exchange in the snow-pack. Field results agreed with theory. Discussion, p. 312.]
- BARTOS, L. R., and RECHARD, P. A. Ablation characteristics of an alpine snowfield in summer. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 90-98.) [Total change in volume of water was determined by two techniques. Mean summer ablation rate was  $6.00 \pm 0.5$  cm/day.]
- BELEN'KIY, B. M., and others. Kolichestvennaya kharakteristika meteley v Khibinakh po mnogoletnim instrumental'nym nablyudeniyam [Quantitative characteristics of snowdrifts on Khibiny according to perennial observations]. [By] B. M. Belen'kiy, L. Ya. Ivanova, N. F. Nechayev, B. N. Rzhnevskiy, S. M. Talalayev. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 141-46. [Study based on observations of snow-storms, 1936-72, on mountains in Murmanskaya Oblast'. English summary, p. 146.]
- BENSON, C. S., and TRABANT, D. C. Field measurements on the flux of water vapour through dry snow. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 291-98.) [Measured upward vapour fluxes in shallow seasonal snow-packs averaged  $0.025 \text{ g cm}^{-2} \text{ day}^{-1}$ , an order of magnitude greater than vapour fluxes calculated from pure diffusion models.]
- BILELLO, M. A. Surface measurements of snow and ice for correlation with data collected by remote systems. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 283-93.) [Describes network of stations in North America where observations on properties of snow and ice thickness are being made. Remote sensing data should be checked against these.]
- BILELLO, M. A., and others. Mesoscale measurement of snow-cover properties, [by] M. A. Bilello, R. E. Bates and J. Riley. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 624-43.) [Presents analysis of information obtained from Fort Greely, Alaska, 1966-67.]
- BLAGOVESHCHENSKIY, V. P. Opredeleyeniye maksimal'nykh dal'nostey vybrosa lavin metodom statisticheskogo analiza vidimyykh granits [Estimate of maximum outburst of avalanches by means of statistical analysis of visible boundaries]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 222-27 [English summary, p. 227.]
- BOHREN, C. F. Theory of radiation heat transfer between forest canopy and snowpacks. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 165-75.) [Study concerned with solution of equations of transfer for model canopy which preserves many essential physical characteristics of an actual canopy and its environment. Discussion, p. 175.]
- BOHREN, C. F., and BARKSTROM, B. R. Theory of the optical properties of snow. *Journal of Geophysical Research*, Vol. 79, No. 30, 1974, p. 4527-35. [Relates optical quantities to mechanical properties: asymptotic flux extinction coefficient and albedo under diffuse illumination to snow-pack density and grain size.]



- BREDELL, J. H. Ten-metre snow studies at Grunchogna base, western Dronning Maud Land. *South African Journal of Antarctic Research*, No. 3, 1973, p. 16–21. [Presents results of determination of mean annual accumulation and of investigation of influence of surface temperatures on snow temperatures at various depths.]
- BROWN, A. J. Long-range goal and information needs of the coordinated snow survey program in California. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 47–54.) [Discusses current trends and needs, especially in forecasting water supply.]
- CARLSON, R., and others. Modelling snowmelt runoff in an Arctic coastal basin, [by] R. Carlson, W. Norton and R. Britch. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 2, p. 1004–16.) [First part of model simulation is snow melt hydrograph generation programme which uses a four component energy transfer computation to transform climatological data into snow melt; the second part uses a two parameter linear storage model to transform snow melt hydrograph into run-off hydrograph. Discussion, p. 1015–16.]
- CHEMERENKO, E. P. Areal averaging of snow cover characteristics. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 1, p. 656–63.) [Discusses problem of accuracy.]
- COLBECK, S. C. On predicting water runoff from a snow cover. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 55–66.) [Evaluates existing theory.]
- COLBECK, S. C. Water flow through snow overlying an impermeable boundary. *Water Resources Research*, Vol. 10, No. 1, 1974, p. 119–23. [Presents two-dimensional model to assist in forecasting run-off and describing water flow in glacial ice and snow. Consists of vertical flow through unsaturated layer and flow along boundary in saturated layer.]
- COLBECK, S. C., and DAVIDSON, G. Water percolation through homogeneous snow. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 1, p. 242–57.) [Discusses gravity-flow theory of water percolation. Discussion, p. 257.]
- DELEUR, M. S., and others. Ispol'zovaniye korrelyatsionnogo analiza dlya issledovaniya prostranstvenno-vremennoy izmenchivosti snegotoyaniya v basseyne r. Kolymy [Use of correlation analysis for the study of variability in time and space of snow melting in the Kolyma river basin]. [By] M. S. Deleur, A. A. Ivanova, V. A. Rummyantsev. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 180–85. [Forecasting stream flow in Yakutskaya A.S.S.R. English summary, p. 185.]
- DEMENT'YEV, A. A. Vliyaniye geograficheskikh usloviy Kol'skogo poluostrova na raspredeleniye snezhnogo pokrova i lavin [The effect of geographical conditions of Kol'skiy Poluostrov on the spreading of snow cover and avalanches]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 146–53. [Study of effect of climate, elevation and vegetation on snow drifting and avalanches in Murmanskaya Oblast'. English summary, p. 152–53.]
- DETWYLER, T. R. Snowmelt along the environmental transect at Chitstone Pass, Alaska during the summers of 1967, 1968, and 1969. (In Bushnell, V. C., and Marcus, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4*. New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974, p. 207–09.) [Transect is 1 075 m long, altitude at west end is 1 794.5 m and at east end 1 852.3 m. Highest point at 1 852.8 m and lowest at 1 772 m.]
- DETWYLER, T. R. Vegetation-snow cover relations in an alpine pass, Alaska. (In Bushnell, V. C., and Marcus, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4*. New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974, p. 355–60.) [Investigates relations between snow duration and distribution of some common tundra plant species in Chitstone Pass.]
- DIETRICH, T. L., and MEIMAN, J. R. Hydrologic effects of patch cutting of lodgepole pine. *Hydrology Papers* (Colorado State University), No. 66, 1974, iv, 31 p. [Paired plot studies of soil water and snow water equivalent at 9 000 ft elevation. Small patch cuts, 0.29 to 0.61 acre, were made, analysis of pre- and post-cut relationships to paired control plots was studied for average increase in water potentially available for stream flow.]
- DOLOV, M. A., ed. Sneg i snezhnyye laviny [Snow and snow avalanches]. *Vysokogornyye Geofizicheskiy Institut. Trudy*, Vyp. 18, 1972, 152 p. [Physics of snow cover, dynamics of avalanches, and methods of measuring snowfall, with reference to the Caucasus mountains.]
- DYUNIN, A. K., and MATVIYENKO, V. S. Mekhanika gornyykh meteley [On the mechanics of mountain snow-drifts]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 136–41. [Snow drifting studied on basis of general mechanics of multi-component flows. Methods described of obtaining data, and theoretical conclusions compared with field results. English summary, p. 141.]
- DYUNIN, A. K., and others. Influence of snow storms on snow cover formation in mountains, [by] A. K. Dyunin, A. A. Komarov and E. P. Isayenko. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 1, p. 76–81.) [Hydrological regime of mountain rivers depends on thickness and distribution of snow cover, which may be affected by wind drifting and avalanches.]
- ENGLEN, G. B. Soil moisture in alpine mountain slopes of Colorado and New Mexico. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 1, p. 342–52.) [Investigation of general characteristics of soil moisture in high-altitude mountain soils with regard to its effect on snow melt. Discussion, p. 352.]
- ENGLEN, G. B. Two-year cycles in soil moisture recharge, snowpack, and streamflow in relation to atmospheric conditions (with special reference to the upper Colorado River basin). (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . . 1973*, Vol. 2, p. 895–914.) [Presents model which explains observed cycles by relating regional hydrological sub-systems



- of the river basin with each other and with the major atmospheric circulation over the western U.S.A. Discussion, p. 913-14.]
- ESCHER, H. Zur Bestimmung des Niveau 365 in den Schweizer Alpen. *Zeitschrift für Geomorphologie*, Neue Folge, Supplementbd. 16, 1973, p. 90-103. [Term "niveau 365" used for climatological snow-lines determined outside a glacial area. Demonstrates that altitude of niveau 365 in Swiss Alps is mainly function of average annual temperature.]
- GARY, H. L. Snow accumulation and snowmelt as influenced by a small clearing in a lodgepole pine forest. *Water Resources Research*, Vol. 10, No. 2, 1974, p. 348-53. [Increased snow catch in clearing was offset by deficit in down-wind forest. Clearing affected areal snow distribution but not total amount of snow water equivalent. Melt rates in clearing were twice those in interior forest.]
- GRANT, L. O., and RHEA, J. O. Elevation and meteorological controls on the density of new snow. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 169-81.) [Discusses results from study relating newly fallen mountain snow density to causal factors such as location and elevation, upper wind direction and speed, temperature regime, and weather modification.]
- GRAY, D. M., and O'NEILL, A. D. J. Application of the energy budget for predicting snowmelt runoff. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 108-18.) [Results from Canadian prairies suggest net radiation is dominant energy source for snow melt at beginning of melt, and amount of sensible heat transfer increases in importance as bare ground appears.]
- GULATI, T. D. Role of snow and ice hydrology in India. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 610-23.) [Presents data from the Himalaya.]
- HAUPT, H. F. Relation of wind exposure and forest cutting to changes in snow accumulation. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1399-1409.) [Shows that excess snow will drift into a cornice to the lee of an open treeless ridge if the trees are removed down-slope on the windward slope. Discussion, p. 1409.]
- HERRMANN, A. Variations de l'épaisseur, de la densité et de l'équivalent en eau d'une couche de neige alpine en hiver. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 96-117.) [Effects of elevation, orientation and vegetation on thickness, density and water equivalent of snow cover may lead to results of variable statistical significance when data are obtained from snow samples of limited size. Discussion, p. 116-17.]
- HORNBECK, J. W., and LIKENS, G. E. The ecosystem concept for determining the importance of chemical composition of snow. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 139-51.) [Importance of snow-pack was evaluated in relation to chemical inputs to forest ecosystem and to chemical outputs in stream flow.]
- HOWELL, W. E. Impact of snowpack management on snow and ice hydrology. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1464-72.) [Reviews situation. Discussion, p. 1472.]
- IWAI, K. On the characteristic features of snow crystals developed along c-axis. *Journal of the Meteorological Society of Japan*, Ser. 2, Vol. 51, No. 6, 1973, p. 458-66. [Presents results of measurements of mass, bulk density, size and riming states of snow crystals developed along c-axis on basis of observations made at 1 600 m a.s.l.]
- JOHNSON, P., and ARCHER, D. R. The significance of snow in Britain. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1098-110.) [Considers effect on river flood discharge and seasonal persistence during run-off cycle.]
- JOLLY, J. P. Influence of air temperature and solar radiation on snowmelt runoff from a small watershed. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1073-77.) [Marked effect of these factors.]
- JOYAL, R. Melting of ice and snow in the Mer Bleue sphagnum bog near Ottawa, Canada. *Canadian Field-Naturalist*, Vol. 88, No. 2, 1974, p. 236-38. [Snow and ice depth records were obtained during two winters, affording data on ecologically significant variations between plant communities.]
- KALININ, G. P., and KYZNETZOVA, L. P. Combined solution of water balance equations of the atmosphere and river basins for definition of water equivalent of snow pack and total runoff. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 762-71.) [Presents results from the U.S.S.R. Discussion, p. 771.]
- KHAPAYEV, S. A. Indikatsionnyye metody v izuchenii lavinnykh prirodnykh kompleksov [Indication methods in studying natural avalanche complexes]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 227-34. [Particular reference to method based on deformation of tree trunks by avalanches. English summary, p. 234.]
- KHAPAYEV, S. A. Rol' lavinnykh snezhnikov v dinamike gornyykh prirodnykh kompleksov (po nablyudeniya v basseyne r. Amanauz) [The role of avalanche snow accumulations in the dynamics of natural mountain complexes (from observations in the Amanauz river basin)]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 207-10. [Effect of avalanche-born snow fields on landforms, microclimate, and vegetation. Central Caucasus. English summary, p. 210.]
- KHMELEVSKOY, I. F. Nakloneniye snega na profile ot Minogo do 170-go kilometra [Snow accumulation along the profile from Mirny to the 170 km mark]. *Informatsionnyy Byulleten' Sovetskoy Antarkticheskoy Ekspeditsii*, No. 88, 1974, p. 30-36.



- KHON, A. I. O rezhime ustoychivogo snezhnogo pokrova na territorii Tadzhikistana [On the regime of stable snow cover in Tadzhikskaya S.S.R.]. *Materiy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 204-07. [English summary, p. 206-07.]
- KOERNER, R. M. Specific electrolytic conductivity of snow and deep core samples, Canadian Arctic Archipelago. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 51-63.) [Highest conductivity values in autumn and mid-to-late winter snows. Significant variation in cores from Meighen Ice Cap attributed to soluble material being blown on to ice cap from surrounding terrain. Discussion, p. 63.]
- KOTLYAKOV, V. M. Snow accumulation on mountain glaciers. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 394-400.) [General considerations of snow accumulation discussed with reference to research in the U.S.S.R. Discussion, p. 399-400.]
- KRAVTSOVA, V. I. Karta snezhnogo pokrova Norvegii [Map of snow cover in Norway]. *Materiy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 41-56, map. [Presents and explains map (scale 1 : 2 000 000) compiled in order to estimate avalanche danger. English summary, p. 55-56.]
- KROUSE, H. R., and SMITH, J. L.  $O^{18}/O^{16}$  abundance variations in Sierra Nevada seasonal snowpacks and their use in hydrological research. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 24-38.) [Discusses measurements made on newly fallen snow and snow-packs at 1 900 m elevation in the central Sierra Nevada, California, during winter storms of 1965-68. Discussion, p. 38.]
- KUROIWA, D., and LACHAPPELLE, E. R. Preparation of artificial snow and ice surfaces for XI Olympic winter games, Sapporo. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 1350-69.) [Summarizes details of construction of surfaces from natural snow, transported and compacted to pre-arranged hardnesses. Discussion, p. 1368-69.]
- LABELLE, J. C. Snow studies at high elevations, Mt. Logan, Yukon. (In Bushnell, V. C., and Marcus, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4*. New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974, p. 211-18.) [Presents results of observations on density, temperature, accumulation and drifting, above 5 300 m.]
- LACHAPPELLE, E. R., and FOX, T. A real-time data network for avalanche forecasting in the Cascade Mountains of Washington state. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 339-45.) [Describes system for collecting daily records of data on snow, weather and avalanche conditions together with synoptic weather information, and discusses results obtained by means of this system.]
- LANDALS, A. L., and GILL, D. Differences in volume of surface runoff during the snowmelt period: Yellowknife, Northwest Territories. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 927-42.) [Describes environmental factors that initiate differences in volume and timing of snow melt run-off in a sub-Arctic region.]
- LANGHAM, E. J. The occurrence and movement of liquid water in the snowpack. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 67-75.) [Study of effect of a layered structure on the distribution and flow of water in snow-pack, using dyes.]
- LANGHAM, E. J. Phase equilibria of veins in polycrystalline ice. *Canadian Journal of Earth Sciences*, Vol. 11, No. 9, 1974, p. 1280-87. [Permeability of ice layers in snow to melt water and rain is due to presence of veins, the size of which is very sensitive to changes of temperature, air pressure and dissolved air or other material. Describes experiments with dye in melt water.]
- LEMMELÄ, R. Measurements of evaporation-condensation and melting from a snow cover. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 670-79.) [Assesses effect of climatic characteristics on snow melt and evaporation from snow cover on basis of hydrometeorological observations made in Finland, 1968-72. Discussion, p. 679.]
- LOGAN, L. A. Basin-wide water equivalent estimation from snowpack depth measurements. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 2, p. 864-84.) [Presents data on snow-pack compiled for four years of observations in Ontario. Discussion, p. 884.]
- MCANDREW, D. W. Snow load analysis and recreational uses of snow data. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources*. . . . Washington, D.C., National Academy of Sciences, 1974, p. 11-21.) [The same data that are used for forecasting stream flow provide information on snow loads on building structures and for evaluating winter recreation site potential.]
- MCKAY, G. A., and THOMPSON, H. A. Mapping of snowfall and snow cover in North America. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 598-609.) [Stresses importance of maps and suggests ways in which they could be improved.]
- MALE, D. H., and others. A dimensional analysis of heat and mass transfer in a snowpack, [by] D. H. Male, D. I. Norum and R. W. Besant. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia*, . . . 1972. . . . 1973, Vol. 1, p. 258-90.) [Analysis yields moduli governing movement of radiant, convective and conductive heat fluxes in snow-pack interior, rates of phase change and movement of melt water and water vapour. Discussion, p. 289-90.]
- MARCUS, M. G. A note on snow accumulation and climatic trends in the Icefield Ranges, 1969-1970. (In Bushnell, V. C., and Marcus, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4*. New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974, p. 219-23.) [Reviews previously proposed altitude-precipitation relationships in the light of snow accumulation and climatic trends for these years.]



- MARTINEC, J. Evaluation of air photos for snowmelt-runoff forecasts. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 2, p. 915-26.*) [Points out how the areal extent of snow cover may affect significantly computations of run-off forecasts, and how this may be evaluated by air photographs. Discussion, p. 926.]
- MARTINELLI, M., jr. Snow fences for influencing snow accumulation. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 2, p. 1394-98.*) [Summarizes investigations on collecting fences, which slow wind and allow snow to settle. Discussion, p. 1398.]
- MEIMAN, J. R. Snow surface modification. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 2, p. 1376-81.*) [Describes treatments to accelerate melt and reduce evaporation. Discussion, p. 1381.]
- MEIMAN, J. R., and GRANT, J. O. *Snow-air interactions and management of mountain watershed snowpack. Completion report. OWRR project no. B-073-COLO.* Fort Collins, Colorado, Colorado State University. Environmental Resources Center, 1974. i l., 36 l. (Completion Report Series No. 57.) [Evaporating losses amounted to 60% in open alpine country, largely due to wind transport, and to 45% in both forested areas and areas with forest openings.]
- MEIMAN, J. R., and LEAVESLEY, G. *Little South Poudre watershed climate and hydrology 1961-1971. Synopsis.* Fort Collins, Colorado, Colorado State University. College of Forestry and Natural Resources, 1974. ii, 22 p. [272 km<sup>2</sup> watershed on east slope of Colorado Front Range, mean elevation 2 959 m, mean slope 32.8%. Precipitation is snow in winter and rain and hail in summer.]
- MEIMAN, J. R., and others. Deuterium as a tracer in snow hydrology, [by] J. [R.] Meiman, I. Friedman and K. Hardcastle. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 1, p. 39-50.*) [Study of areal variability of snow-pack deuterium content and of relationship between deuterium content of snow-pack and that of run-off from small watersheds. Discussion, p. 49-50.]
- MEIMAN, J. R., and others. Deuterium in Rocky Mountain snowpacks, [by] J. R. Meiman, I. Friedman, K. Hardcastle. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 152-60.) [Mean regional content ranged from -133‰ in San Juan Mountains, Colorado, to -183‰ in Big Horn Mountains, Wyoming. Suggests stable isotope composition of snow can be regionalized for studies of snow hydrologic processes.]
- MOSER, H., and others. Measuring the isotope content in precipitation in the Andes, [by] H. Moser, C. Silva, W. Stüchler and L. Stowhas. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 1, p. 14-23.*) [Isotope content appears to be governed by the average temperature during precipitation and by the distance of the sampling point from the coast. Discussion, p. 23.]
- MOSKALEV, YU. D., and others. *Ukazaniya snegolavinykh nagruzok pri proyektirovanii sooruzheniy* [Instructions for calculating snow avalanche loads when planning buildings]. [By] Yu. D. Moskalev, A. V. Runich, V. S. Chitadze, A. M. El'mesov. Moscow, Moskovskoye Otdeleniye Gidrometeoizdata, 1973. 20 p. [Separate maps indicate snow avalanche regions of the U.S.S.R.]
- NEFED'YEVA, YE. A. Snezhnyy pokrov i prirodnyye komplekсы [Snow cover and natural complexes]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 186-90. [English summary, p. 190.]
- O'NEILL, A. D. J., and GRAY, D. M. Solar radiation penetration through snow. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 1, p. 227-41.*) [Discusses results of experiments which indicate that solar radiation penetration and the albedo of snow are coupled and affected by the properties of an active layer adjacent to the snow surface. Discussion, p. 240-41.]
- O'NEILL, A. D. J., and GRAY, D. M. Spatial and temporal variations of the albedo of prairie snowpack. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 1, p. 176-86.*) [Study of the shallow snow-packs of the Canadian prairies. Discussion, p. 186.]
- PABST, A. F. Forecasting snowmelt runoff in the upper Midwest. *Dissertation Abstracts International*, B, Vol. 34, No. 11, 1974, p. 5549-B-50-B. [Development and test of two mathematical models. Abstract of Ph.D. thesis, University of Minnesota, 1973. University Microfilms order no. 74-10560.]
- PEARSON, G. L. Snowpack and related trends in mountains of the southwestern United States. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 22-29.) [Analysis of data indicates changing climate and variability within relatively short geographic distances.]
- PECK, E. L. Methods of measuring snow cover, snowmelt, and streamflow under winter conditions. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 1, p. 582-97.*) [Review of methods in use. Discussion, p. 595-97.]
- POPOV, E. G. Snowmelt runoff forecasts—theoretical problems. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 2, p. 829-39.*) [General review. Discussion, p. 838-39.]
- QUERVAIN, M. R. DE. Snow structure, heat, and mass flux through snow. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 1, p. 203-26.*) [Presents general survey of basic phenomena governing metamorphism of snow and its permeability to heat, vapour and water. Discussion, p. 225-26.]
- QUICK, M. C. Forecasting runoff: operational practices. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973, Vol. 2, p. 943-55.*) [Review. Discussion, p. 954-55.]



- RANDOLPH, P. D., and others. A network of telemetered profiling isotopic snow gauges, [by] P. D. Randolph, R. A. Coates, E. W. Killian, L. O. Johnson and R. L. Heath. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 688-701.) [Describes successful use of network in the U.S.A. in western mountain states. Discussion, p. 700-01.]
- RECHARD, P. A., and RAFFELSON, C. N. Evaporation from snowdrifts under oasis conditions. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 99-107.) [Evapo-sublimation was 20% to 30% of the water equivalent volume of the drift at the start of ablation.]
- REINKING, R. F. Cloud droplet accretion on snow crystals. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 193-203.) [Describes empirically accretion on a population of snow crystals. Results applicable to modelling of precipitation formation and densification and metamorphosis of newly fallen snow.]
- REVIKIN, V. S., and others. Snezhnyy pokrov gornogo Altaya [Snow cover of the Altay mountains]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 160-68. [Discusses distribution of snow cover in relation to geographical factors. English summary, p. 168.]
- RHEA, J. O., and GRANT, L. O. Topographic influences on snowfall patterns in mountainous terrain. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 182-92.) [Discusses preliminary results from study of influence of orographic lifting, large-scale vertical motion, convection and up-stream barrier interception on total snowfall.]
- RICHARDS, T. L. Physics and chemistry of snowfall and snow distribution. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 1, p. 1-13.) [Points out that only in nucleation phase of snow formation are physics and chemistry of snow intimately connected. Discussion, p. 13.]
- RICHARDSON, D. Effect of snow and ice on runoff at Mount Rainier, Washington. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 2, p. 1172-85.) [Presents results defining these effects. Melt water run-off constitutes 41% to 53% of total run-off in five basins. Discussion, p. 1185.]
- RILEY, J. P., and others. Some approaches to snowmelt prediction, [by] J. P. Riley, E. K. Israelsen and K. O. Eggleston. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 2, p. 956-71.) [Presents three mathematical models of the snow melt process.]
- SCHMUGGE, T., and others. Microwave signatures of snow and fresh water ice, [by] T. Schmutge, T. T. Wilheit and P. Gloersen, M. F. Meier and D. Frank, I. Dirmhirn. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 551-62.) [Results indicate effects of volume scattering in dry snow and firn become noticeable for free space wave-lengths shorter than 3 cm, and when liquid water is present the effective loss tangent for snow increases to wash out effects of volume scattering.]
- SCOTT, R. W. The effect of snow duration on alpine plant community composition and distribution. (*In* Bushnell, V. C., and Marcus, M. G., ed. *Icefield Ranges Research Project. Scientific results. Vol. 4*. New York, American Geographical Society; Montreal, Arctic Institute of North America, 1974, p. 307-18.) [Snow depth and duration were found to be important agents affecting composition of vegetation.]
- SCRIVEN, R. A. Airborne mercury fallout on snow around five Swedish chlor-alkali plants. *Atmospheric Environment*, Vol. 8, No. 1, 1974, p. 89-90. [Discussion of paper by A. Jernelöv and T. Wallin, *ibid.*, Vol. 7, No. 2, 1973, p. 209-14.]
- SLAUGHTER, C. W., and CROOK, A. G. The Arctic and subarctic seasonal snowpack: research and management approaches in Alaska. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 273-82.) [General discussion of present research and problems.]
- SMITH, J. L. Hydrology of warm snowpacks and their effects upon water delivery . . . some new concepts. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 76-89.) [Density layering and differential maturation affect water movement.]
- SOLOMON, S. I., and QURESHI, A. S. Application of a parametric model for estimating snow accumulation and flow forecasting. (*In* [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, . . . 1972. . . 1973*, Vol. 2, p. 981-91.) [Presents preliminary results of tests with model, which requires precipitation and temperature as the only input data. Discussion, p. 991.]
- STEPHENSON, G. R., and FREEZE, R. A. Mathematical simulation of subsurface flow contributions to snowmelt runoff, Reynolds Creek watershed, Idaho. *Water Resources Research*, Vol. 10, No. 2, 1974, p. 284-94. ["A mathematical model that has previously experienced only the coddled simplicity of carefully devised hypothetical cases is here introduced to the perils of the real world." Reports first attempt to apply model to simulate transient saturated-unsaturated sub-surface contributions to stream flow at a field site.]
- STEPPUHN, H., and DYCK, G. E. Estimating true basin snowcover. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 314-28.) [Constant similarities in the areal variations of snow covers within areal units having similar landscape features in the same climatic region.]
- STORR, D., and GOLDING, D. L. A preliminary water balance evaluation of an intensive snow survey in a mountainous watershed. (*In* Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. . . .* Washington, D.C., National Academy of Sciences, 1974, p. 294-303.) [Presents results of water balances for snow melt period 1969-73 for Marmot Creek, Alberta, Canada.]



- SWANSON, R. H. Small openings in poplar forest increase snow accumulation. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, ... 1972. ... 1973, Vol. 2, p. 1382-89.*) [Snow accumulation and melt may be increased by creating discontinuities in forest canopy. Discussion, p. 1389.]
- TABLER, R. D., and SCHMIDT, R. A. Weather conditions that determine snow transport distances at a site in Wyoming. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, ... 1972. ... 1973, Vol. 1, p. 118-27.*) [Mathematical model for sublimation of wind-blown snow was applied by measuring air temperature, relative humidity, wind speed and total solar radiation. Results indicate average transport distances of 460 and 900 m for particle diameters of 0.010 and 0.015 cm, respectively. Discussion, p. 126-27.]
- TSOMAYA, V. S., and others. Rol' snezhnikovogo stoka v pitanii gornyykh rek [Firn bank run-off and its role in feeding mountain rivers]. [By] V. S. Tsomaya, L. V. Sidorova, K. L. Abdushelishvili. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 122-26. [Study of melt water run-off in the Caucasus. English summary, p. 126.]
- VIKOGADOV, V. N., and KHODAKOV, V. G. Snezhnyy pokrov Kronotskogo massiva i balans l'da lednika Koryto [Snow cover of the Kronotskiye range and mass balance of Lednik Koryto]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 22, 1973, p. 143-52. [Presents results of measurements made in this part of Kamchatka. English summary, p. 152.]
- VONDER HAAR, T. H. Measurement of albedo over polar snow and ice fields using Nimbus-3 satellite data. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. ... Washington, D.C., National Academy of Sciences, 1974, p. 161-68.*) [Describes albedo data reduction technique, usefulness of surface measurements to augment satellite observations, and patterns and extremes of polar albedo variation measured during 1969-70.]
- VOYTKOVSKIY, K. F. O metodike vybora raschetnykh parametrov dlya proyektirovaniya protivolavinnyykh sooruzheniy [On the methods of choosing calculated parameters for designing avalanche protection constructions]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 219-22. English summary, p. 222.]
- WEICKMANN, H. K. Modification of snow accumulation by cloud seeding in the Great Lakes basin. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, ... 1972. ... 1973, Vol. 2, p. 1370-75.*) [Presents results of recent experiments. Discussion, p. 1375.]
- WENDLER, G., and others. Break-up characteristics of the Chena River watershed, central Alaska, [by] G. Wendler, R. Carlson, D. Kane. (In Santeford, H. S., and Smith, J. L., comp. *Advanced concepts and techniques in the study of snow and ice resources. ... Washington, D.C., National Academy of Sciences, 1974, p. 523-31.*) [Snow melt successfully monitored with ERTS imagery. Comparison with actual measurements and with computer model showed good agreement.]
- WITHERSPOON, D. F., and others. Role of snowmelt in forecasting Great Lakes levels, [by] D. F. Witherspoon, R. L. Pentland, G. W. Kite. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, ... 1972. ... 1973, Vol. 2, p. 1035-46.*) [Principal improvement of forecasting by proposed method attributed to use of estimate of snow-pack water equivalent, which represents more than half the water available to the local supply of the lake during a year.]
- WOO, MING-KO. A numerical simulation model for snow storage in small coastal basins, southwestern British Columbia. (In [International Hydrological Decade.] *The role of snow and ice in hydrology. Proceedings of the Banff symposia, ... 1972. ... 1973, Vol. 2, p. 992-1003.*) [Model requires daily temperature and precipitation data only.]
- ZALIKHANOV, M. CH. Dinamika snezhnogo pokrova Bol'shogo Kavkaza [The dynamics of snow cover of the Great Caucasus]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 153-59. [Effect of altitude. English summary, p. 159.]
- ZALIKHANOV, M. CH., and AKAYEVA, L. A. Snezhnost' zim Bol'shogo Kavkaza [Winter snowfall of the Great Caucasus]. *Materialy Glyatsiologicheskikh Issledovaniy. Khronika. Obsuzhdeniya*, Vyp. 23, 1974, p. 168-73. [Quantity and distribution of snowfall in this area varies considerably from winter to winter. English summary, p. 173.]