BIBLIOGRAPHY

Adam, K. M., 1978: "Winter Road Construction Techniques," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 429–440.

Adams, C. M., D. M. French, and W. D. Kingery, 1963: "Field Solidification and Desalination of Sea Ice," in *Ice and Snow — Processes, Properties, and Applications*, W. D. Kingery, Ed., MIT Press, Cambridge, Mass., pp. 277–287.

Afanasev, V. P., 1972: "Ice Pressure on Vertical Structures," Nat. Res. Council of Canada, Ottawa, Ont., Tech. Transl. 1708.

Ahlgren, L., 1972: "Moisture Fixation in Porous Building Materials," Lund Institute of Technology, Div. of Building Technol., Rep. 36.

Aho, O. K., 1977: "Frost Protection of Shallow Foundations" (in Finnish), University of Oulu, Div. of Road and Soil Construction, Oulu, Publ. 24.

Aitken, G. W., 1974: "Reduction of Frost Heave by Surcharge Stress," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Res. Rep. 184.

Alaluusua, M., 1980: "A Buoy Study at Field" (in Finnish), Finnish Board of Navigation, Int. Rep.

Alasaarela, P., 1979: "Fatigue Strength of Welded Structures" (in Finnish), *Hitsaustekniikka* 29:4–5.

Aldrich, H. P., and H. M. Paynter, 1953: "Analytical Studies of Freezing and Thawing of Soils," U.S. Army ACFEL TR 42.

Algaard, E., 1976: "Frost Protection of Floors, Foundations, and Construction Ground during Construction Period," in *Frost Protection of Cold Structures* (in Norwegian), Roy. Norw. Council Sci. and Ind. Res. and the Public Roads Administration's Committee on Frost Action in Soils, Frost i jord, no. 17, chap. 11, pp. 315–339.

Alkire, B. D., W. M. Haas, and T. J. Kaderabek, 1975: "Improving Low Temperature Compaction of a Granular Soil," *Can. Geotech. J.* 12:527–530.

Allyn, N., and K. Charpentier, 1982: "Modelling Ice Rubble Fields around Arctic Offshore Structures," *Proc. Offshore Technol. Conf.*, OTC 4422.

———, B. R. Wasilewski, 1979: "Some Influences of Ice Rubble Field Formations around Artificial Islands in Deep Water," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Trondheim, Norway), pp. 31–55.

Almazov, V. O., and E. M. Kopaigorodski, 1982: "Bearing Capacity of a Reinforced Concrete Shell in an Arctic Environment," *Cold Regions Sci. Technol.* 6:89–98.

Aluminum Association, 1976: Aluminum standards and data, New York.

American Association of State Highway and Transportation Officials, 1982: "Standard Specifications for Transportation Materials and Methods of Sampling and Testing," AASHTO, Washington, D.C.

American Concrete Institute, 1978: "Cold Weather Concreting," ACI 306R-78.

American National Standards Institute, 1972: "Building Code Requirements for Minimum Design Loads in Buildings and Other Structures," New York, ANSI A58.1-1972.

American Petroleum Institute, 1982: "Bulletin on Planning, Design and Constructing Fixed Offshore Structures in Ice Environments," API, Washington, D.C.

American Society for Testing and Materials, 1977: "Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing," ASTM C666-77.

———, 1977: "Standard Test Method for Critical Dilation of Concrete Specimens Subjected to Freezing," ASTM C671-77.

———, 1978: "Standard Test Method for Plain Strain Fracture Toughness," ASTM E399-78.

American Society of Civil Engineers, 1981: *Proc. Conf. The Northern Community: A Search for a Quality Environment*, T. S. Vinson, Ed., ASCE, New York.

American Society of Heating, Refrigeration, and Air-Conditioning Engineers, 1980: *Handbook and Product Directory*, vol. *Systems*, chap. 38: "Snow Melting," ASHRAE, New York.

———, 1981: *Handbook of Fundamentals*, ASHRAE, Atlanta, Ga.

Andersland, O. B., and D. M. Anderson, Eds., 1978: *Geotechnical Engineering for Cold Regions*, McGraw-Hill, New York.

———, F. H. Sayles, Jr., and B. Landanyi, 1978: "Mechanical Properties of Frozen Ground," in *Geotechnical Engineering for Cold Regions*, O. B. Andersland and D. M. Anderson, Eds., McGraw-Hill, New York, chap. 5, pp. 216–275.

Anderson, D. L., 1958: "Preliminary Results and Review of Sea Ice Elasticity and Related Studies," *Trans. Eng. Inst. Canada* 2:116–122.

———, 1960: "The Physical Constants of Sea Ice," *Research* 13:310–318.

Anderson, D. M., R. Pusch, and E. Penner, 1978: "Physical and Thermal Properties of Frozen Ground," in *Geotechnical Engineering for Cold Regions*, O. B. Andersland and D. M. Anderson, Eds., McGraw-Hill, New York, chap. 2, pp. 36–102.

———, A. R. Tice, and H. L. McKim, 1973: "The Unfrozen Water and the Apparent Specific Heat Capacity of Frozen Soils," *Proc. 2d Intern. Conf. Permafrost* (Yakutsk, U.S.S.R.), North Amer. Contrib., U.S. Nat. Acad. Sci., Washington, D.C., pp. 289–295.

Anno, Y., 1984: "Requirements for Modeling of a Snowdrift," *Cold Regions Sci. Technol.* 8: 241–252.

Armstrong, M. D., and T. I. Csathy, 1963: "Frost Design Practice in Canada," *Highway Res. Rec.*, no. 33, pp. 170–201.

Arridge, R. G. C., 1975: *Mechanics of Polymers*, Oxford University Press, London.

Ashton, G. D., 1974: "Air Bubbler System to Suppress Ice," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Spec. Rep. 210.

———, 1978: "Numerical Simulation of Air Bubbler Systems," *Can. J. Civil Eng.* 5:231–238.

———, 1979: "Point Source Bubbler Systems to Suppress Ice," U.S Army Cold Regions Res. Eng. Lab., Hanover, N.H., Rep. 79–12.

Associated General Contractors and House Builders of Sweden, 1963: *Road Construction Year Round* (in Swedish), Byggnadsindustrins Förlags AB.

Assur, A., 1956: "Airfields on Floating Ice Sheets," U.S. Army Corps of Engineers Snow, Ice, and Permafrost Research Establishment (SIPRE), Tech. Rep. 36.

———, 1958: "Composition of Sea Ice and Its Tensile Strength," in *Arctic Sea Ice*, U.S. Nat. Acad. Sci., Nat. Res. Council, Publ. 598, pp. 106–138.
———, 1961: "Traffic over Frozen or Crusted Surfaces," *Proc. 1st Intern. Conf. Mech. Soil Vehicle Systems* (St. Vincent, Torino, Italy), pp. 913–923.
———, 1971: "Forces in Moving Ice Fields," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Trondheim, Norway), pp. 112–118.
Azmi, M. H., 1978: "Steel Construction in the Arctic," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 330–341.
Baker, M. C., 1980: "Roofs, Design, Application and Maintenance," Nat. Res. Council of Canada, Multiscience Publ. Ltd., Montreal, Que.
Banke, E. G., and S. D. Smith, 1971: "Wind Stress over Ice and over Water in the Beaufort Sea," *J. Geophys. Res.* 76:7369–7374.
——— and ———, 1973: "Wind Stress on Arctic Sea Ice," *J. Geophys. Res.* 78:7871–7873.
——— and ———, 1976: "Recent Measurements of Wind Stress on Arctic Sea Ice," *J. Fish. Res. Board Canada* 33:2307–2317.
Bates, R. E., and M. A. Bilello, 1966: "Defining the Cold Regions of the Northern Hemisphere," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Tech. Rep. 178.
Baudais, D. J., D. M. Masterson, and J. S. Watts, 1974: "A System for Offshore Drilling in the Arctic Islands," 25th Ann. Meet., Pet. Soc. Can. Inst. Mining, Calgary, Alta.
Bennett, F. L., 1976: "Temporary Enclosures and Heating in Cold Regions Construction," *Proc. 2d Intern. Symp. Cold Regions Engineering* (Fairbanks, Alaska), pp. 502–516.
Bennett, I., 1959: "Glaze, Its Meteorology and Climatology, Geographical Distribution and Economic Effects," Quartermaster Res. and Eng. Center, Tech. Rep. EP-105.
Bent, C., 1981: "Accommodation Design for Remote Settlements," *Proc. Conf. The Northern Community: A Search for a Quality Environment*, T. S. Vinson, Ed., ASCE, New York, pp. 115–131.
Bercha, F. G., 1979: "The Development and Application of Multimodal Ice Failure Theory," *Proc. IUTAM Symp. Physics and Mechanics of Ice* (Copenhagen), Springer-Verlag, pp. 16–27.
Berg, R. L., G. L. Guymon, and T. C. Johnson, 1980: "Mathematical Model to Correlate Frost Heave of Pavements with Laboratory Predictions," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 80-10.
Bergedahl, L., 1978: "Thermal Ice Pressure in Lake Ice Covers," Chalmers University of Technology, Dept. of Hydraulics, Göteborg, Rep., ser. A:2.
Bilello, M. A., 1960: "Formation, Growth and Decay of Sea Ice in Canadian Arctic Archipelago," U.S. Army Corps of Engineers Ice, Snow and Permafrost Research Establishment (SIPRE), Res. Rep. 65.
Biyanov, G. F., 1973. "Experience on Constructing Dams on Permafrost in Yakutia, U.S.S.R.," *Proc. 2d Intern. Conf. Permafrost* (Yakutsk, U.S.S.R.), U.S.S.R. Contrib., U.S. Nat. Acad. Sci., Washington, D.C., pp. 594–598.
Bogorodsky, V. V., and V. P. Gavrilo, 1980: *Ice, Physical Properties, Modern Methods of Glaciology* (in Russian), Gidrometeoizdat, Leningrad.
Botz, J. J., and W. M. Haas, 1980: "The Construction of an Embankment with Frozen Soil," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Spec. Rep. 80-21.
Bragg, R. A., and O. B. Andersland, 1980: "Strain Rate, Temperature, and Sample Size Effects on Compression and Tensile Properties of Frozen Sand," *Proc. 2d Intern. Symp. Ground Freezing* (Trondheim, Norway), pp. 34–47.
British Standards Institute, 1977: "Methods for Crack Opening Displacement (COD) Testing," BS5762.
Brown, J. H., 1963: "Elasticity and Strength of Sea Ice," in *Ice and Snow—Processes, Properties and Applications*, W. D. Kingery, Ed., MIT Press, Cambridge, Mass., pp. 76–106.
Brown, W. G., 1963: "Graphical Determination of Temperature under Heated or Cooled Areas on the Ground Surface," Nat. Res. Council of Canada, Ottawa, Ont., Div. of Building Res., Tech. Pap. 163.

Browne, R. D., and P. B. Bamforth, 1981: "The Use of Concrete for Cryogenic Storage; A Summary of Research Past and Present," presented at the 1st Intern. Conf. Cryogenic Concrete (Newcastle).

Bruun, P. M., and P. Johannesson, 1971: "The Interaction between Ice and Coastal Structures," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Trondheim, Norway), pp. 683–712.

Burdick, J. L., E. F. Rice, and A. Phukan, 1978: "Cold Regions: Descriptive and Geotechnical Aspects," in *Geotechnical Engineering for Cold Regions*, O. B. Andersland and D. M. Anderson, Eds., McGraw-Hill, New York, chap. 1, pp. 1–36.

Butkovich, T. R., 1954: "Ultimate Strength of Ice," U.S. Army Corps of Engineers Snow, Ice and Permafrost Research Establishment (SIPRE), Res. Pap. 11.

———, 1956: "Strength Studies of Sea Ice," U.S. Army Corps of Engineers Snow, Ice and Permafrost Research Establishment (SIPRE), Res. Pap. 20.

Calkins, D. J., 1983: "Ice Jams in Shallow Rivers with Floodplain Flow," *Can. J. Civil Eng.* 10:538–548.

——— and G. D. Ashton, 1976: "Passage of Ice at Hydraulic Structures," in *Rivers '76, Symp. Inland Waterways for Navigation, Flood Control and Water Diversion* (Colorado State University, Fort Collins), Reprint, pp. 1726–1736.

——— and M. Mellor, 1975: "Cost Comparison for Lock Wall Deicing," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Hanover, N.H.), pp. 51–66.

Cammaert, A. B., D. R. Miller, and R. J. Gill, 1979: "Concepts for Ice Management at Arctic LNG Terminal," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Trondheim, Norway), pp. 1257–1268.

——— and G. P. Tsinker, 1981: "Impact of Large Ice Floes and Icebergs on Marine Structures," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (University of Laval, Quebec), pp. 653–662.

Canadian Standards Association, 1974: "Design of Highway Bridges," Std. S-6.

Carey, K. L., 1973: "Icings Developed from Surface Water and Ground Water," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Monograph M III-D3.

———, 1977: "Solving Problems of Ice-Blocked Drainage Facilities," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL SR 77-25.

Carlsson, J., 1976: *Fracture Mechanics* (in Swedish), Ingenjörsförslaget, Stockholm.

Casagrande, A., 1931: "Discussion of Frost Heaving," *Highway Res. Board Proc.* 11:163–172.

Central Intelligence Agency, 1978: *Polar Regions Atlas*, Nat. Foreign Assessment Center, C.I.A., Washington, D.C.

Chamberlain, E. J., 1981. "Frost Susceptibility of Soil, Review of Index Tests," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Monograph 81-2.

Chari, T. R., and K. Muthukrishnaiah, 1978: "Iceberg Threat to Ocean Floor Structures," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Luleå, Sweden), pp. 421–435.

Colbeck, S. C., Ed., 1980: *Dynamics of Snow and Ice Masses*, Academic Press, New York.

Cotton, H. C., and I. M. Macaulay, 1976: "Using Steel in Arctic Construction," *Proc. Conf. Materials Engineering in the Arctic* (St. Jovite, Que.), American Society for Metals, pp. 50–58.

Cox, G. F. N., 1979: "Artificial Ice Islands for Exploratory Drilling," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Trondheim, Norway), pp. 147–162.

———, J. A. Richter-Menge, W. F. Weeks, M. Mellor, and H. W. Bosworth, 1984: "The Mechanical Properties of Multi-Year Sea Ice, Phase I: Test Results," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 84-9.

Croasdale, K. R., 1974: "Crushing Strength of Arctic Ice," *Proc. Symp. Beaufort Sea Coast and Shelf Research*, Arctic Inst. of North America, pp. 377–399.

———, 1980: *Ice Forces on Fixed, Rigid Structures*, T. Carstens, Ed., IAHR Working Group on Ice Forces on Structures, U.S. Army Cold Regions Res. Eng. Lab., Spec. Rep. 80–26, pp. 34–106.

——— and R. W. Marcellus, 1981: "Ice Force on Large Marine Structures," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Quebec, Que.), pp. 755–764.

———, N. R. Morgenstern, and J. B. Nuttal, 1976: "Indentation Tests to Investigate Ice Pressures on Vertical Piers," *J. Glaciology* 19(81):301–312.

Crory, F. E., 1963: "Pile Foundations in Permafrost," *Proc. 1st Intern. Conf. Permafrost* (Lafayette, Ind.), pp. 467–476.

———, 1968: "Bridge Foundations in Permafrost Areas: Goldstream Creek, Fairbanks, Alaska," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Tech. Rep. 180.

———, 1973: "Settlement Associated with the Thawing of Permafrost," *Proc. 2d Intern. Conf. Permafrost* (Yakutsk, U.S.S.R.), North Amer. Contrib., U.S. Nat. Acad. Sci., Washington, D.C., pp. 599–607.

———, 1978: "Design and Construction of Temporary Air Fields in the National Petroleum Reserve—Alaska," *The Northern Eng.* 10(3), Fall.

———, 1980: "Use of Piling in Frozen Ground," presented at the ASCE Nat. Conv., Session 3, Cold Regions Eng. (Portland, Ore.).

Danys, J. V., 1978: "Ice Management of Lac St. Pierre, Quebec," *Can. J. Civil Eng.* 5:374–390.

Davison, B. E., J. W. Rooney, and D. E. Bruggers, 1978: "Design Variables Influencing Piles Driven in Permafrost," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 307–318.

de Jong, J. J. A., C. Stigter, and B. Steyn, 1975: "Design and Building of Temporary Artificial Islands in the Beaufort Sea," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Fairbanks, Alaska), pp. 753–789.

Dempsey, B. J., J. Ingersoll, T. C. Johnson, and M. Y. Shahin, 1980: "Asphalt Concrete for Cold Regions," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 80-5.

Dolgopolov, Y. V., V. P. Afanasev, V. A. Korenkov, and D. F. Panfilov, 1975: "Effect of Hummocked Ice on Piers of Marine Hydraulic Structures," *Proc. Intern. Ass. Hydr. Res. Symp. Ice Problems* (Hanover, N.H.), pp. 469–477.

Donelly, P., 1966: "An Outline of the Design and Operation of the Montreal Ice Control Structure," *Proc. Conf. Ice Pressures against Structures* (University of Laval, Quebec), Nat. Res. Council of Canada, Ottawa, Ont., TM 92, pp. 171–184.

Drouin, M., and B. Michel, 1971: "Pressure of Thermal Origin Exerted by Ice Sheets upon Hydraulic Structures" (in French), University of Laval, Quebec, Rep. S-22; also U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Draft Transl. 427.

Eaton, R., and R. Berg, 1978: "Temperature Effects in Compacting an Asphalt Concrete Overlay," *Proc. Conf. Applied Techniques for Cold Environment* (Anchorage, Alaska), pp. 146–158.

Eliason, K., 1978: "Materials, Manpower, Equipment and Methods," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 674–683.

Eranti, E., 1978: "Ice Forces on Structures and Bearing Capacity of Ice Cover" (in Finnish), Finnish Roads and Waterways Administration, Rep. 753320.

———, 1979: "Indentation Experiments with Natural Ice Plates," Helsinki University of Technology, Div. of Struct. Eng., Publ. 21.

———, F. D. Hayes, M. Määttänen, and T. T. Song, 1981: "Dynamic Ice-Structure Interaction Analysis for Narrow Vertical Structures," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (University of Laval, Quebec), pp. 472–479.

——— and G. C. Lee, 1981: "Introduction to Ice Problems in Civil Engineering," State University of New York at Buffalo, Center for Cold Regions Eng., Sci. and Technol., 81-1.

——— and G. C. Lee, 1983: "Introduction to Cold Regions Structural Design and Construction," State University of New York at Buffalo, Center for Cold Regions Eng., Sci. and Technol., 83-1A.

———, E. Leppänen, and M. Penttinen, 1983: "Ice Control in Finnish Harbours," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Helsinki, Finland), pp. 370–380.

———, M. Penttinen, and T. Rekonen, 1983: "Extending the Ice Navigation Season in the Saimaa Canal," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Helsinki, Finland), pp. 381–391.

Esch, D. C., 1983: "Evaluation of Experimental Design Features for Roadway Construc-

tion over Permafrost," *Proc. 4th Intern. Conf. Permafrost* (Fairbanks, Alaska), University of Alaska and Nat. Acad. Sci., Washington, D.C., pp. 283–288.

Everett, D. H., and J. M. Haynes, 1965: "Capillary Properties of Some Model Pore Systems with Reference to Frost Damage," *RILEM Bull.*, new ser. **27**:31–38.

Fagerlund, G., 1977: "The Critical Degree of Saturation Method of Assessing the Freeze/Thaw Resistance of Concrete," RILEM Committee 4 CDC, *Matér. Constr.* **10**(58): 217–229.

———, 1981: "Principles for Frost-Susceptibility of Concrete" (in Swedish), *Nordisk betong*, no. 2, pp. 5–13.

Farouki, O. T., 1981: "Thermal Properties of Soils," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Monograph 81-1.

Finnish Ministry of the Interior, 1978: Finnish collection of building regulations. C3 "Insulation—Regulations;" C4 "Insulation—Instructions" (in Finnish), Helsinki.

Finnish Roads and Waterways Administration, 1980: "Improvement of the Pavement Structure, Design Instructions" (in Finnish), TVH 722336.

Flanders, S. N., 1981: "Cold Regions Testing of an Air-Transportable Shelter," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 81-16.

Foster-Miller Associates, Inc., 1973: "Fundamental Concepts for the Rapid Disengagement of Frozen Soil, Phase 1," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Tech. Rep. 233.

Frankenstein, G. E., and N. Smith, 1970: "The Use of Explosives in Removing Ice Jams," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Reykjavik, Iceland).

Frederking, R. N. W., 1974: "Downdrag Loads Developed by a Floating Ice Cover," *Can. Geotech. J.* **11**:339–347.

———, 1977: "Plain Strain Compressive Strength of Columnar-Grained and Granular-Snow Ice," *J. Glaciology* **18**(89):506–516.

———, 1979: "Laboratory Tests on Downdrag Loads Developed by Floating Ice Covers on Vertical Piles," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Trondheim, Norway), pp. 1097–1110.

——— and L. W. Gold, 1975: "Experimental Study of Edge Loading of Ice Plates," *Can. Geotech. J.* **12**:456–463.

——— and ———, 1976: "The Bearing Capacity of Ice Covers under Static Loads," *Can. J. Civil Eng.* **3**:288–293.

Fullwider, C. W., 1973: "Thermal Regime in an Arctic Earthfill Dam," *Proc. 2d Intern. Conf. Permafrost* (Yakutsk, U.S.S.R.), North Amer. Contrib., U.S. Nat. Acad. Sci., Washington, D.C., pp. 622–628.

Gardner, W. R., 1958: "Some Steady State Solutions of the Unsaturated Flow Equation with Application to Evaporation from a Water Table," *Soil Sci.* **88**:228–232.

Gevay, B. J., and H. A. Erith, 1979: "Electric Heating of Intake Trash Racks at Twin Falls, Labrador," *Can. J. Civil Eng.* **6**:319–324.

Gevirtz, G., and V. Mostkov, 1978: "Specific Features of Constructing Underground Hydraulic Structures in Permafrost Conditions," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 245–262.

Glukhov, V., 1971: "Evaluation of Ice Loads on High Structures from Aerological Observations" (in Russian), *Soviet Hydrology: Selected Papers*, no. 3/1971.

Gold, L. W., 1966: "Observations on the Movement of Ice at a Bridge Pier," *Proc. Conf. Ice Pressures against Structures* (University of Laval, Quebec), Nat. Res. Council of Canada, Ottawa, Ont., TM 92, pp. 135–141.

———, 1971: "Use of Ice Covers for Transportation," *Can. Geotech. J.* **8**:170–181.

———, 1973: "Ice—A Challenge to the Engineer," *Proc. 4th Can. Conf. Applied Mechanics* (Montreal, Que.), pp. G19–G36; Nat. Res. Council of Canada, Ottawa, Ont., Tech. Pap. 395, NRC 13436.

Gray, D. M., and D. H. Male, 1981: *Handbook of Snow*, Pergamon Press, Toronto, Ont., Canada.

Gundersen, P., 1976: "Frost Protection of Utility Lines" (in Norwegian), Roy. Norw. Council Sci. and Ind. Res. and the Public Roads Administration's Committee on Frost Action in Soils, Frost i jord, no. 17, chap. 9, pp. 233–286.

Gurtin, M. E., 1964: "Variational Principles for Linear Initial-Value Problems," *Quart. Appl. Math.* 23:252–256.

Guymon, G. L., and T. V. Hromadka, 1977: "Finite Element Model of Transient Heat Conduction with Isothermal Phase Change (Two and Three-Dimensional)," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Spec. Rep. 77-38.

———, ———, and R. L. Berg, 1984: "Two-Dimensional Model of Coupled Heat and Moisture Transport in Frost Heaving Soils," *Proc. 3d Intern. Offshore Mechanics and Arctic Engineering Symp.*, pp. 91–98.

Hansen, J. B., 1961: "A General Formula for Bearing Capacity," Danish Geotech. Inst., Copenhagen, Bull. 11.

Harlan, R. L., and J. F. Nixon, 1978: "Ground Thermal Regime, in *Geotechnical Engineering for Cold Regions*, O. B. Andersland and D. M. Anderson, Eds., McGraw-Hill, New York, chap. 3, pp. 103–163.

Harrison, J. D., M. G. Dawes, G. L. Archer, and M. S. Kamath, 1979: "The COD Approach and Its Application to Welded Structures, Elastic-Plastic Fracture," ASTM STP 668, pp. 606–631.

Harwood, T. A., 1973: "A Short Summary of Safety Problems in the Arctic," *Proc. Arctic Oil and Gas, Problems and Possibilities*, 5th Cong. Intern. Fondation Française d'Etudes Nordiques (Le Havre), pp. 474–484.

Haugen, D. W., 1978: "Project Management and the Construction of the Trans- Alaska Pipeline System," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 922–936.

Hawkes, J., and M. Mellor, 1972: "Deformation and Fracture of Ice under Uniaxial Stress," *J. Glaciology* 11(61):103–131.

Hayley, D. W., 1981: "Application of Heat Pipes to Design of Shallow Foundations on Permafrost," *Proc. 4th Can. Permafrost Conf.* (Calgary, Alta.), Nat. Res. Council of Canada, Ottawa, Ont., pp. 535–544.

Hedberg, B., L. Berntsson, and O. Berge, 1979: "The Hydrophobe 3L-Concrete, A State-of-Art Report," Chalmers University of Technology, Div. of Concrete Structures, Göteborg, Rep. 79:2.

Heger, F. J., 1978: "Thermal Gradient Deflections and Stresses in Structural Sandwich Insulating Panels," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 385–402.

Heiner, A., 1972: "Strength and Compaction Properties of Frozen Soil," Nat. Swedish Building Res., D11.

Heuer, C. E., J. B. Caldwell, and B. Zamsky, 1983: "Design of Buried Seafloor Pipelines for Permafrost Thaw Settlement," *Proc. 4th Intern. Conf. Permafrost* (Fairbanks, Alaska), University of Alaska and U.S. Nat. Acad. Sci., Washington, D.C., pp. 486–491.

Hoekstra, P., E. Chamberlain, and A. Frate, 1965: "Frost Heaving Pressures," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Res. Rep. 176.

Hopper, H. R., C. P. S. Simonsen, and W. J. S. Poulier, 1978: "Churchill River Diversion, Burntwood River Waterway, Studies to Evaluate Winter Regime," *Can. J. Civil Eng.* 5:586–594.

Huck, R. W., 1967: "Interim Report on the Behavior of Timber Piles under Static Load in Permafrost," U.S. Army Cold Regions Res. Eng. Lab. Hanover, N.H., Tech. Note.

Hudson, R. D., 1983: "Observations on the Extrusion of Sea Ice Rubble," *Intern. Conf. Port and Ocean Engineering under Arctic Conditions* (Tech. Res. Centre of Finland, Espoo), pp. 99–108.

Hwang, C. T., R. Seshadri, and V. G. Krishnayya, 1980: "Thermal Design for Insulated Pipes," *Can. Geotech. J.* 17:613–622.

Hyvärinen, A., 1980: "Electrical Heating of Concrete with Embedded Wires" (in Finnish), in *Rakentajan Kalenteri*, Rakentajain Kustannus Oy, Helsinki, pp. 585–604.

Jahns, H. O., and C. E. Heuer, 1983: "Frost Heave Mitigation and Permafrost Protection for a Buried Chilled-Gas Pipeline," *Proc. 4th Intern. Conf. Permafrost* (Fairbanks, Alaska), University of Alaska and U.S Nat. Acad. Sci., Washington, D.C., pp. 531–536.

———, T. W. Miller, L. D. Power, W. P. Rickey, T. P. Taylor, and J. A. Wheeler, 1973: "Permafrost Protection for Pipelines," *Proc. 2d Intern. Conf. Permafrost* (Yakutsk, U.S.S.R.), North Amer. Contrib., U.S. Nat. Acad. Sci., Washington, D.C., pp. 673–684.

Jessberger, H. L., 1975: "Bearing Strength of Frost-Sensitive Soils after Thawing as a Parameter for Dimensioning Roads and as a Measure for Evaluating Frost Criteria" (in German), *Strasse u. Autobahn* **24**:511–519.

Jobson, H. E., 1973: "The Dissipation of Excess Heat from the Water Systems," *ASCE J. Power Div.* **99**:89–103.

Johannessen, O. M., 1970: "Note on Some Vertical Profiles below Ice Floes in the Gulf of St. Lawrence Near the North Pole," *J. Geophys. Res.* **75**:2857–2862.

Johnson, R., 1980: "Resins and Non-Portland Cements for Construction in the Cold," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Spec. Rep. 80-35.

Johnson, T. C., R. L. Berg, K. L. Carey, and C. W. Kaplar, 1975: "Roadway Design in Seasonal Frost Areas," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Tech. Rep. 259.

———, D. M. Cole, and E. J. Chamberlain, 1978: "Influence of Freezing and Thawing on the Resilient Properties of a Silt Soil beneath an Asphalt Concrete Pavement," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Rep. 78-23.

——— and F. H. Sayles, 1980: "Embankment Dams on Permafrost in the USSR," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Spec. Rep. 80-40.

Johnston, G. H., 1980: "Permafrost and the Eagle River Bridge, Yukon Territory, Canada," *Permafrost Eng. Workshop Proc.* (Sept. 27–28, 1979), Nat. Res. Council of Canada (Associate Committee in Geotech. Res.), Tech. Memo. 130, pp. 12–28.

———, Ed., 1981: *Permafrost, Engineering Design and Construction,* Nat. Res. Council of Canada, Wiley, New York.

——— and B. Ladanyi, 1972: "Field Tests of Grouted Rod Anchors in Permafrost," *Can. Geotech. J.* **9**:176–194.

Jonson, J.-Å., 1977: "Temperatures in Masonry Works during Winter" (in Swedish), Byggforskning, Stockholm, Rep. R-38.

Jumikis, A. R., 1966: *Thermal Soil Mechanics,* Rutgers University Press, New Brunswick, N.J.

Kane, D. L., 1981: "Physical Mechanics of Aufeis Growth," *Can. J. Civil Eng.* **8**:186–195.

Kaplar, C. W., 1954: "Investigation of the Strength Properties of Frozen Soils," U.S. Army ACFEL TR 48/1.

———, 1969: "Laboratory Determination of Dynamic Moduli of Frozen Soils and of Ice," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Res. Rep. 163.

———, 1971: "Some Strength Properties of Frozen Soil and Effects of Loading Rate," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Spec. Rep. 159.

———, 1974 *a*: "Moisture and Freeze-Thaw Effects on Rigid Thermal Insulations," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Tech. Rep. 249.

———, 1974 *b*: "A Laboratory Freezing Test to Determine the Relative Frost Susceptibility of Soils," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Tech. Rep. 250.

Karri, J., 1979: "Reinforcement of Ice" (in Finnish), *J. Struct. Mech.* **12**:4, Helsinki University of Technology.

Kaufman, J. G., D. J. Lege, and R. A. Kelsey, 1978: "Aluminum Alloys for Cold Environments," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 186–200.

Kerr, A. D., 1975: "Ice Forces on Structures Due to Change in Water Level," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Hanover, N.H.), pp. 419–427.

———, 1978: "Forces an Ice Cover Exerts on Rows or Clusters of Piles Due to a Change of the Water Level," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Luleå, Sweden), pp. 511–525.

Kersten, M. S., 1949: "Thermal Properties of Soils," University of Minnesota, Eng. Experiment Station, Bull. 28.

Kilpi, E., and A. Sarja, 1981: "Winter Concreting Guide for Constructors, Safe Winter-Concreting" (in Finnish), Tech. Res. Centre of Finland, VTT, Espoo, Res. Note 62/1981.

Kingery, W. D., 1962: "Sea Ice Engineering Summary Report, Project ICE WAY," U.S. Naval Civil Eng. Lab., Port Hueneme, Calif., Tech. Rep. R189.

Kivisild, H., G. Rose, and D. M. Masterson, 1975: "Salvage of Heavy Construction Equipment by a Floating Sea Bridge," *Can. Geotech. J.* **12**:58–69.

Koivupalo, A., 1981: "The Properties and Use of Hot Concrete in Winter Concreting" (in Finnish), Ass. of the Concrete Industry in Finland, *Betonituote* 4/81.

Kokki, P., and H. Mäkelä, 1980: *Winter Construction, Thermal Protection and Use of Energy* (in Finnish), Rakentajain Kustannus Oy, Helsinki.

Kollmann, F., 1951: *Technology of Wood and Wood Materials* (in German), vol. 1, 2d ed., Springer-Verlag, Berlin.

Konrad, J. -M., and N. R. Morgenstern, 1984: "Frost Heave Prediction of Chilled Pipelines Buried in Unfrozen Soils," *Can. Geotech. J.* **21**:100–115.

Korzhavin, K. N., 1962: "Action of Ice on Engineering Structures," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N. H., Draft Transl. 260.

Kovacs, A., 1976: "Study of Piles Installed in Polar Snow," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 76-23.

———, 1983: "Sea Ice on the Norton Sound and Adjacent Bering Sea Coasts," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Tech. Res. Centre of Finland, Espoo), pp. 654–666.

——— and D. S. Sodhi, 1979: "Ice Pile-up and Ride-up on Arctic and Subarctic Beaches," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (Trondheim, Norway), pp. 127–146.

Krause, G. W., 1978: "Impact of Cold Environments on Contractors," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 896–902.

Kreig, R. A., and R. D. Reger, 1982: "Air-Photo Analysis and Summary of Landform Soil Properties along the Route of the Trans-Alaska Pipeline System," State of Alaska, Div. of Geol. and Geophys. Surveys, Geol. Rep. 66.

Kry, P. R., 1977: "Ice Rubble Fields in the Vicinity of Artificial Islands," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (St. John's, Nfld.), pp. 200–211.

———, 1978: "Statistical Prediction of Effective Ice Crushing Stresses on Wide Structures," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Luleå, Sweden), pp. 33–47.

———, 1979: "Implications of Structure Width for Design Ice Forces," *Proc. IUTAM Symp. Physics and Mechanics of Ice* (Copenhagen), Springer-Verlag, pp. 189–191.

———, 1980: "Ice Forces on Wide Structures," *Can. Geotech. J.* **17**:97–113.

Krzewinski, T. G., E. S. Clarke, and M. C. Metz, 1981: "Present Condition (1980) of the TAPS Gravel Workpad," *Proc. Conf. The Northern Community: A Search for a Quality Environment*, T. S. Vinson, Ed., ASCE, New York, pp. 678–692.

Kudoyarov, V. I., M. P. Pavchich, and V. G. Radchenko, 1978: "Earth and Rock Excavation Technique for Construction of Hydraulic Structures in Regions of Permafrost," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 201–215.

Kuroiwa, D., 1965: "Icing and Snow Accretion on Electric Wires," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Res. Rep. 123.

Lachenbruch, A. H., 1959: "Periodic Heat Flow in a Stratified Medium with Application in Permafrost Problems," U.S. Geol. Survey, Bull. 1052, 51 pp.

———, 1962: "Mechanics of Thermal Contraction Cracks and Ice-Wedge Polygons in Permafrost," Geol. Soc. America, Spec. Pap. 70.

———, 1970: "Some Estimates of the Thermal Effects of a Heated Pipeline in Permafrost," U.S. Geol. Survey, Circular 632.

Ladanyi, B., 1976: "Use of the Static Penetration Test in Frozen Soils," *Can. Geotech. J.* 13:95–110.

———, 1983: "Shallow Foundations on Frozen Soil: Creep Settlement," *ASCE J. Geotech. Eng.* **109**(11).

——— and G. H. Johnston, 1974: "Behaviour of Circular Footings and Plate Anchors Embedded in Permafrost," *Can. Geotech. J.* **11**:531–553.

——— and ———, 1978: "Field Investigations of Frozen Ground," in *Geotechnical Engineering for Cold Regions*, O. B. Andersland and D. M. Anderson, Eds., McGraw-Hill, New York, chap. 9, pp. 459–504.

Lang, T. E., and R. L. Brown, 1980: "Snow-Avalanche Impact on Structures," *J. Glaciology* **25**(93).

Langmuir, I., and K. Blodgett, 1946: "Mathematical Investigation of Water Droplet Trajectories," U.S. Army Air Force, Tech. Rep. 5418.

Larsson, N. O., 1974: "Ice Pressure at Bridges," *Symp. Ice Problems in Stockholm* (in Swedish), IVA Rep. 190.

Lavonie, N. Y., 1966: "Ice Effects on Structures in the Northumberland Strait Crossing," *Proc. Conf. Ice Pressures against Structures* (University of Laval, Quebec), Nat. Res. Council of Canada, Ottawa, Ont., TM 92.

Länsiluoto, J., 1977: "Fabrication and Qualities of Steel and Steel Products," in *Steel Structures* (in Finnish), Finnish Asso. for Civil Eng., RIL 113, chap. 2.

Lehtinen, E., E. Törmi, H. Miettinen, and A. Sarja, 1979: "Infrared Heating of Concrete in Angle Forms" (in Finnish), Tech. Res. Centre of Finland, VTT, Concrete and Silicate Lab., Espoo, Note 59.

Leppävuori, E. K. M., 1977: "Creep of Ice, II" (in Finnish), *J. Struct. Mech.* 10:4, Helsinki University of Technology.

Linell, K. A, and C. W. Kaplar, 1966: "Description and Classification of Frozen Soils," *Proc. Intern. Conf. Permafrost* (Lafayette, Ind., 1963), U.S. Nat. Acad. of Sci., Washington, D.C., Publ. 1287, pp. 481–487.

——— and E. F. Lobacz, 1980: "Design and Construction of Foundations in Areas of Deep Seasonal Frost and Permafrost," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Spec. Rep. 80-34.

——— and J. C. F. Tedrow, 1981: *Soil and Permafrost Surveys in the Arctic,* Oxford University Press, New York.

Lipinski, R., 1978: "The Use of Cost and Schedule Control during Construction of the Trans-Alaska Pipeline," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 951–959.

Livingston, H., and E. Johnson, 1978: "Insulated Roadway Subdrains in the Subarctic for the Prevention of Spring Icings," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), ASCE, pp. 513–521.

Lobacz, E. F., G. D. Gilman, and F. B. Hennion, 1973: "Corps of Engineers Design of Highway Pavements in Areas of Seasonal Frost," *Proc. Symp. Frost Action Roads* (Oslo), pp. 142–152.

Logan, T. H., 1974: "Prevention of Frazil Ice Clogging of Water Intakes by Application of Heat," prepared for Ice Research Committee, Eng. Res. Center, Bureau of Reclamation, Rec-ERC-74-15.

Long, E. L., 1973: "Designing Friction Piles for Increasing Stability at Lower Installed Cost in Permafrost," *Proc. 2d Intern. Conf. Permafrost* (Yakutsk, U.S.S.R.), North Amer. Contrib., U.S. Nat. Acad. Sci., Washington, D.C., pp. 693–699.

———, 1978: "Permafrost Foundation Designs," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 973–987.

Lottman, R. P., 1978: "Predicting Moisture-Induced Damage to Asphaltic Concrete," Nat. Cooperat. Highway Res. Program, Rep. 192.

Löfquist, B., 1954: "Ice Pressure: Studies of the Effects of Temperature Variations," *Trans. ASCE* 119, Pap. 2656.

Lunardini, V. J., 1978: "Theory of *n*-Factors and Correlation of Data," *Proc. 3d Intern. Conf. Permafrost,* Nat. Res. Council of Canada, Ottawa, Ont., pp. 41–46.

———, 1982: "Conduction Phase Change beneath Insulated Heated or Cooled Structures," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 82-22.

Maclean, C., W. Semotiuk, A. Strandberg, and D. M. Masterson, 1981: "Ice Platforms with Urethane Foam Cells in the Neutral Axis Zone and Their Application in Arctic Offshore Drilling," *Proc. Intern. Conf. Port and Ocean Engineering under Arctic Conditions* (University of Laval, Quebec), pp. 49–59.

Manikian, V., 1983: "Pile Driving and Load Tests in Permafrost for the Kuparuk Pipeline System," *Proc. 4th Intern. Conf. Permafrost* (Fairbanks, Alaska), University of Alaska and U.S. Nat. Acad. Sci., Washington, D.C., pp. 804–810.

Mariusson, J. M., S. Freysteisson, and E. B. Eliasson, 1975: "Ice Jam Control, Experience from the Burfell Power Plant, Iceland," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Hanover, N.H.).

Markin, K. F., and Y. O. Targulyan, 1973: "Bearing Capacity of Piles in Permafrost," in *Principles of the Control of Cryogenic Processes during the Development of Permafrost Regions,* S. S. Vyalov, Ed., U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Transl. TL 438.

Masterson, D. M., K. G. Anderson, and A. G. Strandberg, 1979: "Strain Measurements in Floating Ice Platforms and Their Application to Platform Design," *Can. J. Civil Eng.* 6:394–400.

Matilainen, V., and P. Suontausta, 1970: "Artificial Thawing of Snow" (in Finnish), *Rakennustekniikka* 10, Helsinki.

Määttänen, M., 1975: "Ice Forces and Vibrational Behavior of Bottom-Founded Steel Lighthouses," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Hanover, N.H.), pp. 345–355.

———, 1977: "Stability of Self-Excited Ice-Induced Structural Vibrations," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (St. John's, Canada), pp. 684–694.

———, 1979: "Laboratory Tests for Dynamic Ice Structure Interaction," *Proc. Intern. Conf. Port and Ocean Engineering under Arctic Conditions* (Trondheim, Norway), pp. 1139–1154.

———, T. Krankala, J. Hoikkanen, and E. Pulkkinen, 1984: "Calculation Methods for Ice Loads against Offshore Structures," University of Oulu, Dept. of Mech. Eng., Rep. 43.

Mäkelä, H., 1982: "Frost Protection and Insulation of Shallow-Laid Pipelines" (in Finnish), Tech. Res. Centre of Finland, VTT, Espoo, Res. Notes 113.

——— and S. Saarelainen, 1978: "Working Methods for House Foundation Construction in Winter Conditions" (in Finnish), Tech. Res. Centre of Finland, VTT, Geotech. Lab., Espoo, Note 33.

——— and M. Tammirinne, 1979: "Instructions for Frost Protection of Building Foundations" (in Finnish), Tech. Res. Centre of Finland, VTT, Geotech. Lab., Espoo, Rep. 37.

McDougall, J. C., 1977: "The Beaufort Gas Project Surface Facilities," *Proc. 2d Intern. Symp. Cold Regions Engineering* (University of Alaska), pp. 383–400.

McGonical, D., and B. D. Wright, 1982: "First-Year Pressure Ridges in the Beaufort Sea," *Proc. Intermaritec* (Hamburg), pp. 444–459.

McLeod, W. R., 1977: "Atmospheric Superstructure Ice Accumulation Measurements," *Proc. Offshore Technol. Conf.* (Houston, Tex.), OTC 2950.

McRoberts, E. C., 1973: "Stability of Slopes in Permafrost," Ph.D. thesis, University of Alberta, Dept. of Civil Eng., Edmonton.

———, T. C. Law, and T. K. Murray, 1978: "Creep Tests on Undisturbed Ice-Rich Silt," *Proc. 3d Intern. Conf. Permafrost* (Edmonton, Alta.), Nat. Res. Council of Canada, Ottawa, Ont., vol. 1, pp. 539–545.

Mellor, M., 1964: "Snow and Ice on the Earth's Surface," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Monograph II-C1.

———, 1965: "Blowing Snow," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Monograph III-A3c.

———, 1968: "Avalanches," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Monograph III-A3d.

———, 1969: "Foundations and Subsurface Structures in Snow," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Monograph III-A2c.

——— and S. Reed, 1967: "Ice Cap Strains and Some Effects on Engineering Structures," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Tech. Rep. 202.

——— and P. V. Snellman, 1970: "Experimental Blasting in Frozen Ground," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Spec. Rep. 153.

Meyerhof, G. G., 1962: "Bearing Capacity of Floating Ice Sheets," *Trans. ASCE* 127:524–581.

Michel, B., 1966: "Thrust Exerted by an Unconsolidated Ice Cover on a Boom," *Proc. Conf. Ice Pressures against Structures* (University of Laval, Quebec), Nat. Res. Council of Canada, Ottawa, Ont., TM 92, pp. 163–170.

———, 1971: "Winter Regime in Rivers and Lakes," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Monograph III-B1a.

———, 1978: *Ice Mechanics*, University of Laval Press, Quebec.

——— and D. Berenger, 1975: "Algorithm for Accelerated Growth of Ice in a Ship's Track," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Hanover, N.H.).

——— and R. O. Ramseier, 1971: "Classification of River and Lake Ice," *Can. Geotech. J.* 8: pp. 36–45.

——— and N. Toussaint, 1976: "Mechanism and Theory of Indentation of Ice Plates," *J. Glaciology* 18(81):285–300.

Miettinen, H., J. Vuorinen, and H. Kukko, 1981: "Comparison of Codes Concerning Winter Concreting in Finland and in the Soviet Union," Tech. Res. Centre of Finland, VTT, Espoo, Res. Notes 11/1981.

Minsk, L. D., 1977: "Ice Accumulation on Ocean Structures," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 77-17.

———, 1980: "Icing on Structures," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 80-31.

Mironov, S. A., 1956: *Theory and Methods of Winter Concreting* (in Russian), Moscow; also U.S. Army Cold Regions Res. Eng. Lab., Draft Transl. 636.

Mohan, A., 1975: "Heat Transfer in Soil-Water-Ice Systems," *ASCE J. Geotech. Div.* 101(GT2):97–113.

Monfore, G. E., 1954: "Ice Pressure against Dams. Experimental Investigation by the Bureau of Reclamation," *Trans. ASCE* 119:26–38.

Moore, H. E., and F. H. Sayles, 1980: "Excavation of Frozen Materials," collection of papers from a U.S.–Soviet Union joint seminar: *Building under Cold Climates and on Permafrost*, U.S. Dept. of Housing and Urban Develop. and U.S. Army Corps of Engineers, pp. 323–345.

Morgenstern, N. R., and J. F. Nixon, 1971: "One-Dimensional Consolidation of Thawing Soils," *Can. Geotech. J.* 8:558–565.

NAHB Research Foundation, Inc., 1975: "All-Weather Home Building Manual," U.S. Dept. of Housing and Urban Develop. and U.S. Dept. of Housing, Rockville, Md.

Nakano, Y., and N. H. Froula, 1973: "Sound and Shock Transmission in Frozen Soils," *Proc. 2d Intern. Conf. Permafrost* (Yakutsk, U.S.S.R.), North Amer. Contrib., U.S. Nat. Acad. Sci., Washington, D.C., pp. 359–369.

Nevel, D. E., 1961: "The Narrow Free Infinite Wedge on an Elastic Foundation," U.S. Army Corps of Engineers Snow, Ice and Permafrost Research Establishment (SIPRE), Res. Rep. 79.

———, 1970: "Moving Loads on a Floating Ice Sheet," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Res. Rep. 261.

———, 1978: "Bearing Capacity of River Ice for Vehicles," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 78-3.

Nilson, L. O., 1976: "Moisture Problems at Concrete Floors" (in Swedish), Lund Institute of Technology, Rep. TVBM-3002.

Nixon, J. F., 1978: "First Canadian Geotechnical Colloquium: Foundation Design Approaches in Permafrost Areas," *Can. Geotech. J.* 15:96–112.

———, 1979: "Some Aspects of Road and Airstrip Pad Design in Permafrost Areas," *Can. Geotech. J.* 16:222–225.

———, 1983: "Geothermal Design of Insulated Foundations for Thaw Prevention," *Proc. 4th Intern. Conf. Permafrost* (Fairbanks, Alaska), University of Alaska and U.S. Nat. Acad. Sci., Washington, D.C., pp. 924–927.

———, 1984: "Laterally Loaded Piles in Permafrost," *Can. Geotech. J.* 21:431–438.

——— and B. Ladanyi, 1978: "Thaw Consolidation," in *Geotechnical Engineering for Cold Regions*, O. B. Andersland and D. M. Anderson, Eds., McGraw-Hill, New York, chap. 4, pp. 164–215.

——— and G. Lem, 1984: "Creep and Strength Testing of Frozen Saline Fine-Grained Soils," *Can. Geotech. J.* 21:518–529.

——— and E. C. McRoberts, 1976: "A Design Approach for Pile Foundations in Permafrost," *Can. Geotech. J.* 13:40–57.

———, J. Stuchly, and A. R. Pick, 1984: "Design of Norman Wells Pipeline for Frost Heave and Thaw Settlement," *Proc. 3d Intern. Offshore Mechanics and Arctic Engineering Symp.*, vol. 3, V. J. Lunardini, Ed., U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., ASME, pp. 69–76.

Nottingham, D., and A. B. Christopherson, 1983: "Driven Piles in Permafrost: State of the Art," *Proc. 4th Intern. Conf. Permafrost* (Fairbanks, Alaska), University of Alaska and U.S. Nat. Acad. Sci., Washington, D.C., pp. 928–933.

Nykänen, A., and P. Ahtola, 1967: "Winter Concreting" (in Finnish), Finnish Society of Civil Engineers, Helsinki, RIL 51.

Oberbach, K., 1975: *The Properties of Polymers for Structures* (in German), Carl Hanser Verlag, Munich.
Odar, F., 1965: "Simulation of Drifting Snow," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Res. Rep. 174.
Ohstrom, E. G., and S. L. DenHartog, 1976: "Cantilever Beam Tests on Reinforced Ice," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 76-7.
Oksanen, P., 1980: "Adhesion Strength Measurements between Ice and Some Materials" (in Finnish), Tech. Res. Centre of Finland, VTT, Lab. Struct. Eng., Espoo.
O'Neill, K., and R. D. Miller, 1982: "Numerical Solutions for a Rigid-Ice Model of Secondary Frost Heave," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 82-13.
Paige, R. A., and C. W. Lee, 1966: "Sea Ice Strength Studies on the McMurdo Sound during the Austral Summer 1964–65," U.S. Naval Civil Eng. Lab., Tech. Rep. R-437.
Panfilov, D. F., 1960: "Experimental Investigation of the Carrying Capacity of an Ice Cover," Izvestiya Vsesoyuznogo Nauchno-Issledovatel skogo, Instituta Gidrotekhniki, vol. 64, pp. 101–115.
Pariset, E., R. Hausser, and A. Gagnon, 1966: "Formation of Ice Covers and Ice Jams in Rivers," *ASCE J. Hydr. Div.* **92**(6):1–24.
Parmerter, R. R., and M. D. Coon, 1973: "Model of Pressure Ridge Formation in Sea Ice," *J. Geophys. Res.* **77**(33).
Pedersen, K. B., 1977: "Frost Protection of Norwegian Road Tunnels" (in Norwegian), Frost i jord, Oslo, no. 19, pp. 27–32.
Pellini, W. S., 1971. AWS Adams Lecture, "Principles of Fracture Safe Design, Part I," *Welding J.*, Res. Suppl., Mar.
Penner, E., and L. E. Goodrich, 1983: "Adfreezing Stresses on Steel Pipe Piles, Thompson, Manitoba," *Proc. 4th Intern. Conf. Permafrost* (Fairbanks, Alaska), University of Alaska and U.S. Nat. Acad. Sci., Washington, D.C., pp. 979–983.
Penttala, V., and E. Törmi, 1977: "Infrared Heating of Concrete Structures in Winter Construction Circumstances" (in Finnish), Tech. Res. Centre of Finland, VTT, Concrete and Silicate Lab., Espoo, Note 45.
Perdichizzi, P., and T. Yasuda, 1978: "Port of Anchorage Marine Terminal Design," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 875–886.
Perham, R. E., 1976: "Some Economic Benefits of Ice Booms," *Proc. 2d Intern. Symp. Cold Regions Engineering* (Fairbanks, Alaska), pp. 570–591.
———, 1977: "St. Mary River Ice Booms, Design Force Estimate and Field Measurements," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 77-4.
———, 1978: "Righting Moment in a Rectangular Ice Boom Timber or Pontoon," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Luleå, Sweden), pp. 273–289.
———, 1980: "Harnessing Frazil Ice," presented at the Workshop of Hydraulic Resistance of River Ice, Canada Center for Inland Waters, Burlington, Ont.
Peterson, N., 1966: "Concrete Quality Control and Authorization of Ready Mixed Concrete Factories in Sweden," Swedish Cement and Concrete Res. Inst. of Technol., Stockholm.
Péwé, T. L., 1982: "Geologic Hazard of the Fairbanks Area, Alaska," Alaska Geol. and Geophys. Surveys, Spec. Rep. 15.
Peyton, H. R., 1966: "Sea Ice Strength," University of Alaska, Geophys. Inst., Rep. UAG R-182.
———, 1968: "Ice and Marine Structures, Parts I, II, and III," *Ocean Industry*, Mar., Sept., Dec.
Pihlajavaara, S. E., and H. Syrjälä, 1960: "Temperature Changes of Fresh Concrete in Winter Concreting, Theory and Applications" (in Finnish), Tech. Res. Centre of Finland, VTT, Concrete and Silicate Lab., Espoo, Publ. 50.
Pilkington, G. R., and R. W. Marcellus, 1981: "Methods of Determining Pipeline Trench Depths in the Canadian Beaufort Sea," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (University of Laval, Quebec), pp. 674–687.
Portland Cement Association, 1979: *Design and Control of Concrete Mixtures*, 12th ed.
Potter, R. E., D. L. Reid, J. C. Bruce, and P. G. Noble, 1982: "Development and Field Testing of a Beaufort Sea Ice Boom," *Proc. Offshore Technol. Conf.*, OTC 4381.
Price, W. I. J., 1961: "The Effect of the Characteristics of Snow Fences on the Quality and

Shape of the Deposited Snow," General Assembly of International Union of Geodesy and Geophysics, Publ. 54.

Prodanovic, A., 1981: "Upper Bounds of Ridge Pressure on Structures," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (University of Laval, Quebec), pp. 1288–1302.

Pufahl, D. E., and N. R. Morgenstern, 1980: "Remedial Measures for Slope Instability in Thawing Permafrost," *Proc. 2nd Intern. Symp. Ground Freezing* (Trondheim, Norway), Trondheim University, Norwegian Inst. Technol., pp. 1089–1101.

Pugh, H. L. D., and W. I. J. Price, 1954: "Snow Drifting and the Use of Snow Fences," *Polar Record* 7(47).

Ralston, T. D., 1977: "Ice Force Design Consideration for Conical Offshore Structures," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (St. John's, Nfld.), pp. 741–752.

———, 1978: "An Analysis of Ice Sheet Indentation," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Luleå, Sweden), pp. 5–31.

Rantamäki, J., 1972: "Ice Indentation Tests during Winter 1971–1972 for Oulu-Kemi Navigation Channel" (in Finnish), Finnish Board of Navigation.

Räsänen, E., 1980: "Steel Structures for Low Application Temperatures" (in Finnish), Insinöörijärjestöjen Koulutuskeskus, INSKO 124-80 I.

———, 1982: "Use of High Tensile Steels in Welded Constructions," *Scand. J. Metallurgy* 11:115–121.

Reike, J. K., and G. E. Clock, 1966: "A New Adherent Thermoplastic Polyethylenic Material—High Density Polyethylene Acrylic Acid Graft Copolymers," *Proc. 22d Ann. Tech. Conf. of the Society of Plastics Engineers* (Montreal, Que.), sec. VI-6.

Reinicke, K. M., 1979: "Analytical Approach for the Determination of Ice Forces Using Plasticity Theory," *IUTAM Symp. Physics and Mechanics of Ice* (Copenhagen), Springer-Verlag, pp. 325–341.

Rekonen, T., 1973: "Effects of Ice on Navigation and Navigational Aids," *PIANC 23, Intern. Navigation Conf.* (Ottawa), Pap. S II-4.

Réunion Internationale des Laboratoires d'Essais et de Recherches sur les Matériaux et les Constructions, 1980: "International Recommendations on Winter Concreting" (first draft), RILEM Tech. Comm. on Winter Concreting (BH-39), B. A. Krylov, Chairman, Moscow.

Rice, E., 1975: "Building in the North," *The Northern Eng.*, University of Alaska, Geophys. Inst., Fairbanks.

Riska, K., P. Kujala, and J. Vuorio, 1983: "Ice Load and Pressure Measurements on Board I. B. Sisu," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions*, Tech. Res. Centre of Finland, VTT, Espoo, pp. 1055–1069.

Roberts, W. S., 1976: "Regionalized Feasibility Study of Cold Weather Earth Work," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Spec. Rep. 76-2.

Rolfe, S. T., and J. M. Barsom, 1977: *Fracture and Fatigue Control in Structures*, Prentice-Hall, Englewood Cliffs, N.J.

Rowley, R. K., G. H. Watson, and B. Ladanyi, 1973: "Vertical and Lateral Pile Load Tests in Permafrost," *Proc. 2d Intern. Conf. Permafrost* (Yakutsk, U.S.S.R.), U.S. Nat. Acad. Sci., Washington, D.C., pp. 712–721.

———, ———, and ———, 1975: "Prediction of Pile Performance in Permafrost under Lateral Load," *Can. Geotech. J.* 12:510–523.

Royal Norwegian Council for Scientific and Industrial Research and the Public Roads Administration's Committee, 1976: "Frost Action in Soils" (in Norwegian), Vegdirektoratet/NTNF.

Rumer, R. R., R. Crissman, and A. Wake, 1979: "Ice Transport in Great Lakes," State University of New York at Buffalo, Dept. of Civil Eng., Water Resources and Environmental Eng. Res. Rep. 79-3, and Center for Cold Regions Eng. and Sci. Technol., Contrib. 79-1.

Sadovsky, S. I., N. A. Zinchenko, and S. I. Korol, 1978: "Winter Concreting at the Sayano-Shushenskaya Hydro Project," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 275–286.

Sanger, F. J., 1963: "Degree Days and Heat Conduction in Soils," *Proc. Intern. Conf. Permafrost*, NAS-NRC, pp. 253–263.

———, 1969: "Foundations of Structures in Cold Regions," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Monograph MIII-C4.
Saunders, T. F., and M. Timascheff, 1973: "Ice Effects on Planning, Design and Operation of Major Oil Terminal," *Proc. 23d Intern. Navigation Cong.* (Ottawa, Ont.), General Secreteriat of P.I.A.N.C., Brussels, Pap. S.II-4.
Save, S., 1975: "Properties of Wood and Strength of Glued Joints at Low Temperatures" (in Finnish), Technical University of Helsinki, Dept. of Wood Processing, Otaniemi.
Sayles, F. H., 1968: "Creep of Frozen Sands," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Tech. Rep. 190.
———, 1973: "Triaxial and Creep Tests on Frozen Ottawa Sand," *Proc. 2d Intern. Conf. Permafrost* (Yakutsk, U.S.S.R.), North Amer. Contrib., U.S. Nat. Acad. Sci., Washington, D.C., pp. 384–391.
——— and D. Haines, 1974: "Creep of Frozen Silt and Clay," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Tech. Rep. 252.
Shira, D. L., 1978: "Hydroelectric Power Plant Siting in Glacial Areas," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 59–76.
Siple, P. A., 1945: "Measurements of Dry Atmospheric Cooling in Subfreezing Temperatures," *Proc. Amer. Philos. Soc.* 89:177–199.
Sodhi, D. S., 1979: "Buckling Analysis of Wedge Shaped Floating Ice Sheet," *Proc. Intern. Conf. Port and Ocean Engineering under Arctic Conditions* (Trondheim, Norway), pp. 797–810.
Sundberg-Falkemark, N., 1963: "Load Bearing Capacity of Ice," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Draft Transl. 684.
Svenska Byggnadsentreprenörföreningens Produktionsråd (Production Council of Swedish Contractors), 1963: "Year-Round Road Construction" (in Swedish), Rep. 1.
Swinzow, G. K., 1970: "Permafrost Tunnelling by a Continuous Mechanical Method," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Tech. Rep. TR 221.
Sykes, J. F., 1973: "The Thaw and Consolidation of Permafrost," Thesis, University of Waterloo, Ont., Canada.
———, W. C. Lennox, and R. G. Charlwood, 1974*a*: "Finite Element Permafrost Thaw Settlement Model," *ASCE J. Geotech. Div.* 100(GT11):1185–1201.
———, ———, and T. E. Unny, 1974*b*: "Two-Dimensional Heated Pipeline in Permafrost," *ASCE J. Geotech. Div.* 100(GT11):1203–1214.
Tada, H., P. Paris, and G. Irwin, 1973: "The Stress Analysis of Cracks Handbook," DEL Research Corp., Hellertown, Penn.
Tart, R. G., Jr., 1983: "Winter Constructed Gravel Islands," *Proc. 4th Intern. Conf. Permafrost*, University of Alaska and U.S. Nat. Acad. Sci., Washington, D.C., pp. 1233–1238.
——— and M. Luscher, 1981: "Construction and Performance of Frozen Gravel Fills," *Proc. Conf. The Northern Community: A Search for a Quality Environment*, T. S. Vinson, Ed., ASCE, New York, pp. 693–704.
Tattelman, P., and I. Gringorten, 1973: "Estimated Glaze Ice and Wind Loads at the Earth's Surface for the Contiguous United States," U.S. Air Force Cambridge Res. Lab., Bedford, Mass., Rep. AFCRL-TR-73-0646.
Taylor, D. A., 1981: "Snow Loads for the Design of Cylindrical Curved Roofs in Canada, 1953–1980," *Can. J. Civil Eng.* 8:63–76.
Templin, J. T., and W. R. Schriever, 1982: "Loads Due to Drifted Snow," *ASCE J. Struct. Div.*, 108(ST8):1916–1925.
Tesaker, E., 1975: "Accumulation of Frazil Ice in an Intake Reservoir," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Hanover, N.H.).
Thomas, B. C., 1981: "Lightering with Air Cushion Vehicles in Alaska," *Proc. Conf. The Northern Community: A Search for a Quality Environment*, T. S. Vinson, Ed., ASCE, New York, pp. 249–263.
Thompson, E. G., and F. H. Sayles, 1972: "In Situ Creep Analysis of Room in Frozen Soil," *ASCE J. Soil Mech. Foundations Div.* 98:899–915.
Thunell, B., 1942: "Quality and Strength in Practice" (in Swedish), Statens Provningsanst., Stockholm, Medd. 89.
Titus, J. B., 1967: "Effect of Low Temperature (0 to −65°F) on the Properties of Plastics," Plastics Tech. Evaluation Center, Picatinny Arsenal, Dover, N.J., Plastec Rep. 30.

Tobiasson, W., 1971: "Deterioration of Structures in Cold Regions," *Proc. Symp. Cold Regions Engineering* (University of Alaska College), pp. 425–448.
———, 1980: "Roofs in Cold Regions," ASCE, Preprint 80-172A.
———, H. Ueda, and G. Hine, 1974: "Measurement of Forces within the Structural Frame of DEW Line Ice Cap Stations DYE-2 and DYE-3," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Spec. Rep. 205.
Torgersen, S. E., 1976: "Design of Ground Supported Floors against Frost Action" (in Norwegian), Roy. Norw. Council for Sci. and Ind. Res. and the Public Roads Administration's Committee on Frost Action in Soils, Frost i jord, no. 17, chap. 10, pp. 287–314.
Tsytovich, N. A., 1975. *The Mechanics of Frozen Ground,* McGraw-Hill, New York.
Tynkkynen, S., and I. Ojala, 1979: "Development of Energy Saving Winter Construction Techniques, Additional Winter Expenses, State of the Art" (in Finnish), Tech. Res. Centre of Finland, VTT, Lab. of Construction Economy, Espoo, Note 56/79.
UNESCO, 1970: *Proc. Symp. Ecology of Subarctic Regions* (Helsinki, Finland), UNESCO, Paris.
Urabe, N., and A. Yoshitake, 1981: "Steel Selection System and Reliability Analysis of Structures in Cold Regions," *Proc. Conf. Port and Ocean Engineering under Arctic Conditions* (University of Laval, Quebec), pp. 462–471.
U.S. Air Force, Geophys. Res. Directorate, 1960: *Handbook of Geophysics,* Macmillan, New York.
U.S. Forest Service, 1961: "Snow and Avalanches: A Handbook of Forecasting and Control Measures," Dept. of Agriculture, Agriculture Handbook 194.
U.S. Naval Facilities Engineering Command, 1975: "Design Manual, Cold Regions Engineering," Alexandria, Va., NAVFAC DM-9.
U.S.S.R. design code SNiP II-18-76, 1977: "Bases and Foundations on Permafrost" (in Russian), Gosstroi, Strojizdat, Moscow.
U.S.S.R. design code SNiP III-15-76, 1977: "Cast in Place Concrete and Reinforced Concrete Structures" (in Russian), Gosstroi, Strojizdat, Moscow.
Uzuner, M. S., 1975: "Stability of Ice Blocks beneath the Ice Cover," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Hanover, N.H.)
Vance, G. P., 1980: "Clearing Ice-Clogged Shipping Channels," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Rep. 80-28.
Van Ginkel Associates, Ltd., 1976: "Building in the North," vols. 1 and 2, prepared for Canadian Arctic Pipeline, Ltd., Gulf Oil Canada, Ltd., Imperial Oil, Ltd., and Shell Canada, Ltd.
Varsta, P., 1983: "On the Mechanics of Ice Load on Ships in Level Ice in the Baltic Sea," Techn. Res. Centre of Finland, VTT, Espoo, Publ. 11.
Veldman, W. M., and E. K. Yaremko, 1978: "Design and Construction of River Training Structures." *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 852–863.
Velli, J. J., V. V. Dokutsajeva, and N. F. Fjedorova, 1977: *Handbook of Building in Permafrost Area* (in Russian), Strojizdat, Leningradskoje otdelenije, Leningrad.
Ven Te Chow, 1959: *Open Channel Hydraulics,* McGraw-Hill, New York.
Vinson, T. S., 1978: "Response of Frozen Ground to Dynamic Loading," in *Geotechnical Engineering for Cold Regions,* O. B. Andersland and D. M. Anderson, Eds., McGraw-Hill, New York, chap. 8, pp. 405–458.
Virtanen, R., 1978: "Breaking and Thawing Frost" (in Finnish), *Maansiirto* 1:42–47.
Vita, C. L., and J. W. Rooney, 1978: "Seepage-Induced Erosion along Buried Pipelines," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 864–874.
Vivitrat, V., and J. R. Kreider, 1981: "Ice Force Prediction Using a Limited Driving Force Approach," *Proc. Offshore Technol. Conf.,* OTC 4115, pp. 471–485.
Vosikovsky, O., 1968: "Critical Stress Model for Determining the Fracture Stress Transition Temperature in Mild Steel," *Techn. Dig.* 10:271–277.
Vyalov, S. S., 1959: *Rheological Properties and Bearing Capacity of Frozen Soils* (in Russian), U.S.S.R. Acad. Sci. Press; also U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Transl. 74 (1965).

———, Ed., 1962: "The Strength and Creep of Frozen Soils and Calculations for Ice-Soil Retaining Structures," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., SIPRE Transl. 76(1965).

———, 1963: "Rheology of Frozen Soils," *Proc. Intern. Conf. Permafrost* (Lafayette, Ind.), U.S. Nat. Acad. Sci., Washington, D.C., Publ. 1287, pp. 332–339.

———, V. V. Dokuchayev, D. A. Sheynkmen, Y. I. Gaydayenko, and Y. M. Goncharov, 1973: "Ground Ice as the Bearing Surface for Construction," in *Principles of the Control of Cryogenic Processes during the Development of Permafrost Regions*, S. S. Vyalov, Ed., U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Transl. TL 438.

Wahanik, R. J., 1978: "Influence of Ice Formations in the Design of Intakes," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), pp. 582–597.

Walden, J. T., and D. F. Dickens, 1982: "Design of an Air Cushion Transporter for Arctic Operations," *Offshore Technol. Conf.* (Houston, Tex.), OTC 4379.

Walker, D. B. L., D. W. Hayley, and A. C. Palmer, 1983: "The Influence of Subsea Permafrost on Offshore Pipeline Design," *Proc. 4th Intern. Conf. Permafrost* (Fairbanks, Alaska), University of Alaska and U.S. Nat. Acad. Sci., Washington, D.C., pp. 1338–1343.

Wang, Y. S., 1978: "Buckling Analysis of a Semi-Infinite Ice Sheet Moving against Cylindrical Structures," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Luleå, Sweden), pp. 117–133.

Watson, G. H., W. A. Slusarchuk, and R. K. Rowley, 1973: "Determination of Some Frozen and Thawed Properties of Permafrost Soils," *Can. Geotech. J.* 10:592–606.

Weaver, J. S., and N. R. Morgenstern, 1981: "Pile Design in Permafrost," Nat. Res. Council of Canada, *Can. Geotech. J.* 18: pp. 357–370.

Webb, W. E., and W. F. Blair, 1975: "Ice Problems in Locks and Channels on the St. Lawrence River," *Proc. Intern. Ass. Hydr. Res. (IAHR), Intern. Symp. Ice* (Hanover, N.H.), pp. 15–24.

Weeks, W. F., and D. L. Anderson, 1958: "An Experimental Study of the Strength of Young Sea Ice," *Trans. Amer. Geophys. Union* 39:641–647.

——— and A. Assur, 1967: "The Mechanical Properties of Sea Ice," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., Monograph II-C3.

Weishar, A. L., 1976: "Special Problems of Construction in the Arctic," *Proc. Intern. Conf. Materials Engineering in the Arctic* (St. Jovite, Que.), Amer. Soc. for Metals, pp. 16–20.

Wellman, J. H., E. S. Clarke, and A. C. Condo, 1977: "Design and Construction of Synthetically Insulated Gravel Pads in the Alaskan Arctic," *Proc. 2d Intern. Symp. Cold Regions Engineering* (University of Alaska), pp. 62–85.

Williams, C. J., 1978: "Snow Road Construction," *Proc. Conf. Applied Techniques for Cold Environments* (Anchorage, Alaska), ASCE, New York, pp. 598–609.

Wilson, C., 1967: "Introduction to Northern Hemisphere I," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Monograph I-A3a.

———, 1969: "Climatology of the Cold Regions, Northern Hemisphere II," U.S. Army Cold Regions Res. Eng. Lab., Hanover, N.H., CRREL Monograph I-A3b.

Wise, J. L., and A. L. Comiskey, 1980: "Superstructure Icing in Alaskan Water," U.S. Nat. Oceanic and Atmospheric Administration, Pacific Marine Environmental Lab., Seattle, Wash., Spec. Rep.

Wortley, C. A., 1978: "Ice Engineering Guide for Design and Construction of Small Craft Harbors," University of Wisconsin, Advisory Rep. SG-78-417.

Wu, R. C., K. J. Chang, and J. Schwartz, 1976: "Fracture in the Compression of Columnar-Grained Ice," *Eng. Fracture Mech.* 8:365–372.

Wyman, M., 1950: "Deflections of an Infinite Plate," *Can. J. Res.* 28: pp. 293–302.

Yarmak, E., Jr., and E. L. Long, 1983: "Some Considerations Regarding the Design of Two Phase Liquid/Vapor Convection Type Passive Refrigeration Systems," Arctic Foundations, Inc., Anchorage, Alaska, unpublished.

Yoder, E. J., and M. W. Witczak, 1975: *Principles of Pavement Design*, 2d ed., Wiley, New York.

Zirjacks, W. L., and C. T. Hwang, 1983: "Underground Utilidors at Barrow, Alaska: A Two-Year History," *Proc. 4th Intern. Conf. Permafrost* (Fairbanks, Alaska), University of Alaska and U.S. Nat. Acad. Sci., Washington, D.C., pp. 1513–1517.

UNIT CONVERSION TABLE

Metric units	U.S. customary units	U.S. customary units	Metric units
	Length		
1 km = 1000 m	= 0.6214 mi	1 mi = 1760 yd	= 1.60934 km
1 m = 1000 mm	= 1.0936 yd	1 yd = 3 ft	= 0.91440 m
	= 3.2808 ft	1 ft = 12 in	= 0.3048 m
1 mm	= 0.0394 in	1 in	= 25.4 mm
	Area		
1 km^2 = 100 ha	= 0.3861 mi^2	1 mi^2 = 640 acres	= 2.58999 km^2
1 ha = 10,000 m^2	= 2.47105 acre	1 acre = 4840 yd^2	= 0.40469 ha
1 m^2 = 1,000,000 mm^2	= 1.1960 yd^2	1 yd^2	= 0.83613 m^2
	= 10.7639 ft^2	1 ft^2	= 0.09290 m^2
1 mm^2	= 0.00155 in^2	1 in^2	= 645.160 mm^2
	Volume		
1 m^3 = 1000 L	= 1.30795 yd^3	1 yd^3	= 0.76456 m^3
	= 35.3147 ft^3	1 ft^3	= 0.02832 m^3
			= 28.3168 L
1 L = 1 dm^3	= 0.03532 ft^3		
1 cm^3 = 1 mL	= 0.06102 in^3	1 in^3	= 16.3871 cm^3
	Mass		
1 tonne = 1000 kg	= 0.98421 long ton	1 long ton = 2240 lb	= 1.01605 tonne
	= 1.10231 short ton	1 short ton = 2000 lb	= 0.90718 tonne
1 kg = 1000 g	= 2.20462 lb	1 lb	= 0.45359 kg

Unit Conversion Table (*continued*)

Metric units	U.S. customary units	U.S. customary units	Metric units
		Density	
1 kg/m³ = 0.001 g/cm³	= 1.68556 lb/yd³	1 lb/yd³	= 0.59328 kg/m³
	= 0.06243 lb/ft³	1 lb/ft³	= 16.0185 kg/m³
		Force	
1 MN = 1000 kN	= 100.361 long tons	1 long ton	= 9.96402 kN
	= 112.404 short tons	1 short ton	= 8.89644 kN
1 kN = 1000 N	= 0.22481 kip	1 kip = 1000 lb	= 4.44822 kN
	= 224.809 lb	1 lb	= 4.44822 N
		Pressure, stress	
1 MPa = 1 MN/m²	= 0.14504 kip/in²		= 15.4443 MPa
1 kPa = 1 kN/m²	= 0.14504 lb/in²		= 107.252 kPa
1 Pa = 1 N/m²	= 0.02089 lb/ft²	1 kip/in² = 1000 lb/ in²	= 6.89476 MPa
		1 lb/in²	= 6.89476 kPa
		1 lb/ft²	= 47.8803 Pa
		Velocity, speed	
1 km/h = 0.278 m/s	= 0.62137 mi/h	1 mi/h = 1.466 ft/s	= 1.6093 km/h
			= 0.4470 m/s
	= 0.540 knot	1 knot	= 1.853 km/h
1 m/s	= 3.28084 ft/s	1 ft/s	= 0.3048 m/s
1 cm/s	= 0.39370 in/s	1 in/s	= 2.540 cm/s
		Volume rate of flow	
1 m³/s = 1000 L/s	= 35.3147 ft³/s	1 ft³/s	= 0.02832 m³/s
1 L/s	= 2.11888 ft³/min	1 ft³/min	= 0.47195 L/s
		Work, energy, heat	
1 MJ = 10⁶ Nm	= 0.27778 kWh	1 kWh	= 3.6 MJ
		1 Btu	= 1.0551 kJ
		1 ft·lb = 0.3238 cal	= 1.3558 J

Metric units	U.S. customary units	U.S. customary units	Metric units
1 kJ = 1000 J 1 J = 0.2388 cal	= 0.94782 Btu = 0.73756 ft·lb		
	Power, heat flow rate		
1 kW 1 W = 1 J/s	= 1.34102 hp = 3.41214 Btu/h	1 hp = 550 ft·lb/s 1 Btu/h	= 0.74570 kW = 0.29307 W
	Calorific value		
1 kJ/kg = 1 J/g 1 kJ/m^3	= 0.42992 Btu/lb = 0.02684 Btu/ft^3	1 Btu/lb 1 Btu/ft^3	= 2.326 kJ/kg = 37.2589 kJ/m^3
	Heat flux		
1 W/m^2	= 0.316998 Btu/(ft^2·h)	1 Btu/(ft^2·h)	= 3.15459 W/m^2
	Thermal conductance		
1 W/(m^2·°C)	= 0.17611 Btu/(ft^2·h·°F)	1 Btu/(ft^2·h·°F)	= 5.6783 W/(m^2·°C)
	Thermal resistance		
1 (m^2·°C)/W	= 5.678 (ft^2·h·°F)/Btu	1 (ft^2·h·°F)/Btu	= 0.17611 (m^2·°C)
	Thermal conductivity		
1 W/(m·°C)	= 0.57779 Btu/(ft·h·°F) = 6.93347 Btu·in/(ft^2·h·°F)	1 Btu/(ft·h·°F) 1 Btu·in/(ft^2·h·°F)	= 1.73073 W/(m·°C) = 0.14423 W/(m·°C)
	Heat capacity		
1 kJ/(kg·°C) 1 kJ/(m^3·°C)	= 0.23885 Btu/(lb·°F) = 0.01491 Btu/(ft^3·°F)	1 Btu/(lb·°F) 1 Btu/(ft^3·°F)	= 4.18680 kJ/(kg·°C) = 67.0661 kJ/(m^3·°C)
	Thermal diffusivity		
1 m^2/s = 10^6 mm^2/s 1 mm^2/s	= 10.7639 ft^2/s = 0.03875 ft^2/h	1 ft^2/s 1 ft^2/h	= 0.0929 m^2/s = 25.806 mm^2/s

INDEX

ABOUT THE AUTHORS

ESA M. ERANTI, an arctic engineering specialist at Finn-Stroi Oi in Finland, has considerable experience in a variety of structural design and development projects. A native of Finland, he is a member of several Finnish boards and working groups managing and promoting cold region engineering research. Mr. Eranti received an undergraduate degree in civil engineering at Helsinki University of Technology and a master's degree in civil engineering from the State University of New York at Buffalo.

GEORGE C. LEE, Ph.D., is Professor and Dean, Faculty of Engineering and Applied Sciences, State University of New York at Buffalo. He is also the founder and associate director of the Calspan-UB Research Center in Buffalo, a structural engineering consultant, and the coauthor of *Structural Analysis and Design* (with R.L. Ketter and S.P. Prawel) and *Design of Single Story Rigid Frames* (with R.L. Ketter and T.L. Hsu). Dr. Lee received his B.S. degree in civil engineering from National Taiwan University and his master's and doctor's degrees from Lehigh University.

Ring tensile strength of sea ice In Ice and snow properties, process and applications Multiaxial compressive strcngth tests on saline ice with brush-type loading platens. Jan 1963. 526-539. P Graystone. M P W D Lancleben. M I T Kingery. Press.Â In Ice and snow properties, process and applications. Edited by W. D. Kingery. M.I.T. Press, Cambridge, MA. Hausler, f. u. 1981. Multiaxial compressive strcngth tests on saline ice with brush-type loading platens. Proceedings of the International Association for Hydraulic Research International Symposium on Ice, ~ u e b e c, P.Q., pp. 526-539. Report on the task-committee on standardizing testing methods for ice Size effects on ice and their influence on the structural design of offshore structures. Jan 1975. In Ice and Snow: Properties, Processes and Applications (W. D. Kingery, Ed.), MIT Press, Cambridge, Mass., p. 248â€“257.Google Scholar. Bergdahl, L. (1977) Physics of ice and snow as affects thermal Pressure. Department of Hydraulics, Goteborg, Sweden, Chalmers University of Technology, Rept. Series A: l, 158p.Google Scholar. By W. D. Kingery. No cover image. Ice and Snow: Properties, Processes, and Applications. By W. D. Kingery. Read preview. Ice and Snow: Properties, Processes, and Applications. By W. D. Kingery. No cover image. Ice and Snow: Properties, Processes, and Applications. By W. D. Kingery. Read preview. Excerpt.Â Sea ice has been used for aircraft landings and other structural purposes; submarine operations under the arctic sea ice have become commonplace.Â At the present time, publications related to ice and snow appear in many different journals, and studies are carried out in many individual laboratories. From the . . .