

## GLACIOLOGICAL LITERATURE

THIS selected list of glaciological literature has been prepared by J. W. Glen with the assistance of T. H. Ellison, W. B. Harland, Miss D. M. Johnson, W. H. Ward, G. T. Warwick and the Staff of the Scott Polar Research Institute. Its field is 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 the *Polar Record*. For Russian material the system of transliteration used is that agreed by the U.S. Board on Geographic Names and the Permanent Committee on Geographical Names for British Official Use in 1947. Readers can greatly assist by sending reprints of their publications to the Society, or by informing Dr. Glen of publications of glaciological interest.

### GENERAL GLACIOLOGY

- FIELD, W. O. Some aspects of glaciers and glaciology. (*In The dynamic north. Book 1, chapter 8.* Washington, D.C., Chief of Naval Operations, 1956, iv, 19 p. (OPNAV PO3-12.)) [Past and present.]
- [HYDROLOGY: BIBLIOGRAPHY.] *Soobshcheniya o nauchnykh rabotakh po gidrologii* [Communications of scientific works on hydrology]. Moskva, Izdatel'stvo Akademii Nauk SSSR, 1957. 32 p. [Short survey of Soviet work on surface waters, underground water and snow and ice, 1950-56, and bibliography of 552 items.]
- [INTERNATIONAL GEOPHYSICAL YEAR, 1957-58.] *A bibliography for the International Geophysical Year.* [Washington, D.C.], National Science Foundation, 1957. vi, 51 p. (NSF-57-25.) [Classified according to technical fields and regional divisions.]
- PASCHINGER, H. Gletscher und glaziale Formenwelt auf modernen Alpenkarten. *Petermanns Geographische Mitteilungen*, Ergänzungsheft 264, 1957, p. 239-45. [Criticism of portrayal of glacial features on some alpine maps and praise of Swiss *Landeskarte 1:50,000* for this purpose.]
- PÉGUY, C. P., and CORBEL, J. Chronique arctique. *Norvís*, No. 15, 1957, p. 395-409. [Includes total land ice cover of the Arctic in detail and physical geography of the Russian Arctic.]
- SHUMSKIY, P. A. Principes de glaciologie structurale. La pétrographie de la glace comme méthode d'étude glaciologique. Traduction par J. Pietresson de Saint-Aubin et A. Bauer. *Annales du Centre d'Études et de Documentation Paléontologiques*, No. 22, 1957, 309 p. [Full translation of *Osnovy strukturnogo ledovedeniya . . .* (Moscow, 1955).]

### GLACIOLOGICAL INSTRUMENTS AND METHODS

- LEFÈVRE, C., and others. Mesures électriques et telluriques sur le Grand Glacier d'Aletsch, par C. Lefèvre, P. Albertinoli, A. Bauer, A. Blum, L. Cagniard et H. Fournier. *Annales de Géophysique*, Tom. 13, No. 1, 1957, p. 54-68. [Describes new apparatus, its preliminary tests and its use on Grosser Aletsch Gletscher for electric prospecting of ice and rock.]
- LINELL, K. Ice drilling and coring equipment. *Eastern Snow Conference. Proceedings*, Vol. 2, 10th Meeting, 1953 and 11th Meeting, 1954, [pub. 1955?], p. 3-6. [Hand-operated tools described.]

### PHYSICS OF ICE

- BIBIKOV, D. N. K voprosu o chisle kristallov l'da, nakhodyashchikhsya b pereokhlazhdennoy vode [The number of ice crystals in supercooled water]. *Doklady Akademii Nauk SSSR* [Reports of the Academy of Sciences of the U.S.S.R.], Tom 109, No. 6, 1956, p. 1123-25. [Experiments and theory for number of ice crystals in water if variation of temperature is known.]
- GHORMLEY, J. A. Thermal behaviour of amorphous ice. *Journal of Chemical Physics*, Vol. 25, No. 3, 1956, p. 599. [Experiments on heat of crystallization.]
- KACHURIN, L. G., and others. O temperaturnykh granitsakh obrazovaniya ledyanykh chastits v peresyshchennom vodyanom pare [Temperature limits for formation of ice particles in supersaturated water vapour]. By L. G. Kachurin, N. A. Zaytseva and S. I. Lomanova. *Izvestiya Akademii Nauk SSSR. Seriya Geofizicheskaya* [News of the Academy of Sciences of the U.S.S.R. Geophysical Series], 1956, No. 7, p. 857-61. [Results of experiments.]
- KOLESNIKOV, A. G., and BELYAYEV, V. I. O kristallizatsii pereokhlazhdennoy vody, podverzhennoy turbulentnomu peremeshivaniyu [Crystallization of supercooled water subjected to turbulent stirring]. *Doklady Akademii Nauk SSSR* [Reports of the Academy of Sciences of the U.S.S.R.], Tom 109, No. 6, 1956, p. 1129-32. [Theory of number of crystals formed in given time.]
- LOTZE, W. Schallgeschwindigkeitsmessungen von Eis in Abhängigkeit von Druck und Temperatur. *Zeitschrift für Geophysik*, Jahrg. 23, Ht. 5, 1957, p. 243-49. [Measurements of longitudinal sound waves in ice show slight increase of velocity with decreasing temperature and increasing stress. Numerical values given.]
- MAGONO, C., and others. On the behaviour of water droplets in the air at temperatures below freezing, by C. Magono, K. Orikasa and T. Yamazati. *Journal of the Faculty of Science, Hokkaido University*, Ser. 7, Vol. 1, No. 1, 1957, p. 1-5. [Behaviour of water droplets in a cold chamber and probable connexion with vapour trails.]
- SWINBANK, W. C. Crystallization of supercooled water by ultrasonic irradiation. *Journal of Meteorology*, Vol. 14, No. 2, 1957, p. 190. [Note describing experiments.]

### LAND ICE. GLACIERS. ICE SHELVES

- ABBADESSA, F. Rilievi e indagini sul Ghiacciaio dei Forni (Valtellina). *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 6, 1955, p. 101-28. [Photogrammetric survey in 1953 used to find change in area and volume of snout of this glacier, and comparison with total mass of glacier based on accumulation data.]
- AMBACH, W. Zur Bestimmung des Luft- und Schmelzwassergehaltes des Gletscherseises. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 3, Ht. 3, 1956, p. 297-304. [Method for determining air and meltwater content of glacier ice.]

- BAUER, A. Contribution à la connaissance du Vatnajökull—Islande: seconde partie. *Jökull*, År 6, 1956, p. 16-20 [Calculation of mean altitude of névé, accumulation-ablation regime, of Vatnajökull; comparison with Grosser Aletsch Gletscher and Greenland ice sheet.]
- BECKER, BILL. South Pole land above sea level. *United States Naval Institute Proceedings*, Vol. 84, No. 2, 1958, p. 141-43. [Results of seismic soundings by Daniel Linchan, December 1957.]
- BJÖRNSSON, F. Kviárjökull. *Jökull*, År 6, 1956, p. 20-22. [Advance and retreat of Kviárjökull in Örafi, Iceland, since 1790's. English summary.]
- BROCKAMP, B. Eisseismische Untersuchungen. *Zeitschrift für Geophysik*, Jahrg. 23, Ht. 5, 1957, p. 241-42. [Brief record of seismic research in glaciers made by various expeditions.]
- CUNIETTI, M., and MARAZIO, A. Rilevo fotogrammetrico della lingua terminale del Ghiacciaio del Lys eseguito nell' agosto 1953. *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 6, 1955, p. 1-18. [Details of photogrammetric survey of Ghiacciaio del Lys in 1953 and comparison of resulting map with that of 1925 to give the diminution of ice. Includes map at 1 : 4000.]
- DYBECK, M. W. An ice-margin lake in Iceland. *Geographical Journal*, Vol. 123, Pt. 1, 1957, p. 127-30. [Topographical changes resulting from recent recession of Langjökull ice cap.]
- ECHO, M. W. New discovery in Fossil Mt. Cave. *National Speleological Society of America News*, Vol. 14, No. 11, 1956, p. 109-10. [Short report of discovery of new passage containing large, plate-shaped sublimation crystals.]
- EYTHÓRSSON, J. Frá Nordurlandsjökulum. Brot úr dagbók 1939. *Jökull*, År 6, 1956, p. 23-29. [Observations of glaciers in north Iceland, 1939: Heljardalheidi, Tungnahryggsjökull, Gljúfrárjökull, Heidinnamannadalur, Barkárjökull.]
- HARRISON, A. E. Der Mount Rainier, Washington und seine Gletscher. *Erdkunde*, Bd. 10, Ht. 4, 1956, p. 308-09. [Comments on article by V. R. Bender and others in *ibid.* Bd. 9, Ht. 4, 1955, p. 263-86, concerning variations of Nisqually glacier since 1910.]
- HATTERSLEY-SMITH, G. The Ellesmere ice shelf and the ice islands. *Canadian Geographer*, No. 9, 1957, p. 65-70. [Discussion of tracks, origin and composition of T-1, T-2 and T-3.]
- HEINSHEIMER, G. J. Zur Hydrologie und Glaziologie des Lago Argentino und Ventisquero Moreno, Argentinien. II. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 3, Ht. 3, 1956, p. 327-33. [Glaciar Moreno advanced and reclosed Canal de los Témpanos in August 1954. Possible outflows of resulting lake discussed.]
- HEUBERGER, H. Beobachtungen über die heutige und eiszeitliche Vergletscherung in Ost-Nepal. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 3, Ht. 3, 1956, p. 349-64. [Present snow line and former ice cover in region near Mt. Everest.]
- HOFMANN, W. Der Mount Rainier, Vulkan- und Gletscherberg im amerikanischen Nordwesten. *Jahrbuch des Deutschen Alpenvereins*, 1957, p. 61-67. [Description of Mount Rainier Glacier, Washington.]
- HOINKES, H. Die Bedeutung des aufgefrorenen Eises (superimposed ice) für die Entstehung von Kryokonitlöchern. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 3, Ht. 3, 1956, p. 305-12. [Ice formed by refreezing of water on a cold glacier surface is particularly suitable for formation of cryoconite holes.]
- HUBLEY, R. C. Recent growth of glaciers in the Pacific Northwest. *American Alpine Journal*, Vol. 10, No. 1, 1956, p. 162-63. [Seventy-three glaciers observed; 50 are advancing, the remainder are growing although the snouts are not yet advancing.]
- KICK, W. Der Chogo-Lungma-Gletscher im Karakorum. *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 3, Ht. 3, 1956, p. 335-47. [Data for Chogo Lungma Glacier cover the last 150 years and show that it has retreated markedly.]
- KICK, W. Vor hundert Jahren im Himalaja. *Jahrbuch des Deutschen Alpenvereins*, 1957, p. 53-60. [Geography and glaciology in the Himalaya 100 years ago from old records and photographs.]
- KOVALEV, P. V. Lednik Bashil'. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [News of the All-Union Geographical Society], Tom 90, Vyp. 1, 1958, p. 59-62. [Description of glacier in Caucasus.]
- LESKA, C. Il rilevamento stereofotogrammetrico del Ghiacciaio di Tyndall (Gruppo del Cervino). *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 6, 1955, p. 97-99. [Report of photogrammetric survey of this glacier in 1953 with map at 1 : 10,000.]
- LESKA, C., and others. Il Ghiacciaio di Valtournanche, per C. Lesca, M. Vanni e F. De Gemini. *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 6, 1955, p. 33-78. [Details of photogrammetric survey of this glacier in 1953 with map at 1 : 5000 by C. Lesca; study of the morphology and history of its retreat by M. Vanni; study of run-off by F. De Gemini. English summary p. 78.]
- LLIBOUTRY, L. *Nieves y glaciares de Chile: fundamentos de glaciología*. Santiago de Chile, Ediciones de la Universidad de Chile, 1956. 471 p. [Full treatise on glaciology of Chile.]
- MOSER, R. Hundert Jahre Schwund der Dachstein-Gletscher. *Zeitschrift für Gletscherkunde*, Bd. 3, Ht. 3, 1956, p. 369-70. [Tables showing loss of area and mass of Dachstein glaciers between 1850-56 and 1951-52.]
- PAL'GOV, N. N. Balans odnogo iz Maloalmatinskikh lednikov khrebeta Zailiyskiy Alatau [Balance of one of the Maloalmatinskiye glaciers of the Zailiyskiy Alatau range]. *Vestnik Akademii Nauk Kazakhskoy SSR* [Messenger of the Academy of Sciences of the Kazakhskaya S.S.R.], No. 6(135), 1956, p. 71-78. [Lednik Tsentral'nyy Tuyuksuyskiy in Tyan Shan mountains.]
- PAL'GOV, N. N. Maloalmatinskiye ledniki khrebeta Zailiyskiy Alatau [Maloalmatinskiye glaciers of the Zailiyskiy Alatau chain]. *Voprosy Geografii Kazakhstana* [Questions of the Geography of Kazakhstan] (Alma-Ata), Vyp. 1, 1956, p. 93-124. [General description of glaciers, regime studies and retreat data.]
- PHILBERTH, B. Beseitigung radioaktiver Abfallsubstanzen. *Atomkern-Energie* (München), 1956, Ht. 11/12, 6 p. (Reprint.) [Calculations of regime of an ice sheet used to show that radioactive waste might be safely disposed of at centre of Greenland ice sheet.]

- PIGNANELLI, S. I Ghiacciai dello Spluga e della Val di Lei dopo oltre un ventennio di osservazioni (1931-1953). *Bollettino del Comitato Glaciologico Italiano*, Ser. 2, No. 6, 1955, p. 79-92. [General description of changes in glaciers in these two valleys.]
- ROHRHOFER, F. Untersuchungen an Ötztaler Gletschern über den Rückgang 1850-1950. *Geographischer Jahresbericht aus Österreich*, Bd. 25, 1953-54, p. 57-84. [Detailed account of the successive fluctuations of 4 Ötztal glaciers, 1850-1950.]
- SHARP, R. P. Glaciers in the Arctic. (*In The dynamic north. Book 1, chapter 7.* Washington, D.C., Chief of Naval Operations, 1956, iv, 44 p. (OPNAV PO3-28.)) [General review of size, nature and distribution of arctic and subarctic glaciers.]
- THIEL, E., and others. The thickness of Lemon Creek Glacier, Alaska, as determined by gravity measurements, by E. Thiel, E. La Chapelle and J. Behrendt. *Transactions. American Geophysical Union*, Vol. 38, No. 5, 1957, p. 745-49. [Juneau Ice Field, 1956. Method and results.]
- THOMPSON, H. R. Glaciers and land forms in the Cumberland Peninsula of Baffin Island. *Eastern Snow Conference. Proceedings*, Vol. 2, 10th Meeting, 1953 and 11th Meeting, 1954, [pub. 1955?], p. 29-34. [Glaciological and geomorphological work of Baffin Island Expedition, 1953, leader P. D. Baird.]
- THORARINSSON, S. On the variations of Svinafellsjökull, Skaftafellsjökull and Kviárjökull in Öraefi. *Jökull*, ÁR 6, 1956, p. 1-15. [Advance and retreat of glaciers in Iceland, mainly in last two centuries.]
- UNTERSTEINER, N. Glazial-meteorologische Untersuchungen im Karakorum. 1. Strahlung. *Archiv für Meteorologie, Geophysik und Bioklimatologie Ser. B*, Bd. 8, Ht. 1, 1957, p. 1-30. [Measurement of radiation balance on the Chogo Lungma Glacier, Karakoram.]
- WEGENER, K., and GEORGI, J. Temperatur- und Dichte-Messungen des grönländischen Inlandeises. *Annales de Géophysique*, Tom. 12, No. 4, 1956, p. 283-86. [Discussion by Wegener of errors in paper by Georgi, *ibid.*, Tom. 12, No. 1, 1956, p. 102-10, on temperature and density measurements of Greenland ice sheet, and reply by Georgi.]
- WEXLER, H. Some aspects of antarctic geophysics. *Tellus*, Vol. 10, No. 1, 1958, p. 76-82. [Time taken for antarctic ice sheet to build up to present mass; present regime; effect on air temperature.]
- ZAGORSKAYA, N. G. Sovremennoye oledeneniye arhipelaga Severnoy Zemli [Contemporary glacierization of the Severnaya Zemlya archipelago]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva [News of the All-Union Geographical Society]*, Tom 89, Vyp. 6, 1957, p. 508-15. [Description, based on field work 1948-51.]
- ICEBERGS, SEA, RIVER AND LAKE ICE
- ARMSTRONG, T. E. "Ice clusters." *Polar Record*, Vol. 7, No. 48, 1954, p. 185. [Sea ice terminology. Proposed English equivalent of Soviet term *ledovyy massiv*.]
- BLACK, W. A. *An illustrated glossary of ice types in the Gulf of St. Lawrence*. Ottawa, Department of Mines and Technical Surveys, Geographical Branch, 1957. [52] p. (Miscellaneous Papers Series. Geographical Paper No. 11.) [Results of 1957 photographic survey.]
- BLACK, W. A., comp. *Selected bibliography on sea ice distribution in the coastal waters of Canada*. Ottawa, Department of Mines and Technical Surveys, Geographical Branch, 1957. [iv], 50 p. (Bibliographical Series, No. 18.) [Listed alphabetically by author and title with references to file on ice conditions maintained by Geographical Branch.]
- CORDINI, R. I. Algunas observaciones sobre el hielo en el Mar de Weddell (Antártida Argentina). *Annales de la Sociedad Científica Argentina*, Tom. 62, Nos. 5-6, 1956, p. 119-47. [Discussion of characteristics and dispositions of pack ice in Weddell Sea.]
- DROGAYTSEV, D. A. Zony szhatiya i razrezheniya l'da v pole atmosfernogo davleniya [Zones of increased and decreased concentration of ice in the atmospheric pressure field.] *Izvestiya Akademii Nauk SSSR. Seriya Geofizicheskaya [News of the Academy of Sciences of the U.S.S.R. Geophysical Series]*, 1956, No. 11, p. 1332-37. [Formulae expressing relations between wind speed and direction and concentration of off-shore ice.]
- ELLIOTT, F. E. Some factors affecting the extent of ice in the Barents Sea area. *Arctic*, Vol. 9, No. 4, 1956, p. 249-57. [Correlation between amount of ice in Barents Sea and variations in transport of Florida current.]
- FEL'ZENBAUM, A. I. Teoreticheskiye osnovy rascheta dreyfa l'dov v tsentral'nom arktisheskom basseyne [Theoretical principles of calculating ice-drift in the central arctic basin]. *Doklady Akademii Nauk SSSR [Reports of the Academy of Sciences of the U.S.S.R.]*, Tom 113, No. 2, 1957, p. 307-10. [New formula which takes account of ice thickness.]
- GIRS, A. A. Interrelation of processes in the atmosphere and hydrosphere. [Translated by Nina A. Stepanova.] (*In The dynamic north. Book 1, chapter 15.* Washington, D.C., Chief of Naval Operations, 1956, vi, 45 p. (OPNAV PO3-31.)) [Author distinguishes 3 basic types of atmospheric circulation in Arctic, and relates them to ice conditions in Soviet Arctic seas.]
- GUDKOVICH, Z. M. K izucheniyyu nevetrovoy sostavlyayushchey dreyfa l'dov [Study of the non-wind component of ice drift]. *Problemy Arktiki [Problems of the Arctic]*, 1957, No. 1, p. 19-27. [Nature and effect of factors other than wind, based on observations at drifting station SP-5 in Arctic Ocean, 1955.]
- HANSEN, R., and LINELL, K. Strength and uses of fresh and salt water ice. (*In The dynamic north. Book 2, chapter 12.* Washington, D.C., Chief of Naval Operations, 1956, iv, 19 p., tables. (OPNAV PO3-16.)) [Floating ice as an aid to transportation. Includes results of ice strength tests.]
- KONKINA, N. G. K voprosu o klassifikatsii rek SSSR po ledovomu rezhimu [On the question of the classification of rivers of the U.S.S.R. by ice regime]. *Vestnik Leningradskogo Universiteta*, No. 18. *Seriya Geologii i Geografii*, Vyp. 3 [Messenger of Leningrad University, No. 18. *Geology and Geography Series*, Vyp. 3], 1957, p. 119-27. [Division into 6 main groups, with sub-groups. English summary.]
- LAVROV, V. V. Yavleniye obrazovaniya vnutrivodnogo l'da kak protsess umnozheniya kristallicheskih zarodyshyey [The phenomenon of formation of frazil ice as a process of multiplying crystal nuclei]. *Problemy Arktiki [Problems of the Arctic]*, 1957, No. 1, p. 91-97.

- MEL'KHEYEV, M. N. Ob usloviyakh obrazovaniya i strukturnykh tipakh donnogo l'da na rekakh vostochnoy Sibiri [Conditions of formation and structural types of anchor ice in rivers of eastern Siberia]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [News of the All-Union Geographical Society], Tom 90, Vyp. 1, 1958, p. 63-66.
- PALOSUO, E. Über verschiedene Vereisungstypen im Finnischen Meerbusen. *Deutsche Hydrographische Zeitschrift*, Jahrg. 9, Ht. 5, 1956, p. 222-25. [Types of ice formation in the Gulf of Finland.]
- SHELL, I. I. Interrelations of Arctic ice with the atmosphere and the ocean in the North Atlantic-Arctic and adjacent areas. *Journal of Meteorology*, Vol. 13, No. 1, 1956, p. 46-58.
- STEVENS, H. W. Data on ice thickness. *Eastern Snow Conference. Proceedings*, Vol. 3, 12th Meeting, 1955, [pub. 1956?], p. 7-19. [Summarizes records of occurrence, duration and quality of fresh and salt water ice in northern hemisphere; suitability for landing aircraft; methods of measuring ice thickness.]
- SVERDRUP, H. U. Arctic sea ice. (*In The dynamic north. Book 1, chapter 6.* Washington, D.C., Chief of Naval Operations, 1956, 17 p. (OPNAV PO3-20.)) [Terminology; outline of physical properties and movement.]
- SVERDRUP, H. U. The stress of the wind on the ice of the polar sea. *Norsk Polarinstitut. Skrifter*, Nr. 111, 1957, 11 p. [Results of experiments made from *Maud*, 1922-24, between lat. 71° 59' and 76° 43' N. and long. 170° 50' and 138° 06' E.]

## GLACIAL GEOLOGY

- DONNER, J. J., and WEST, R. G. The Quaternary geology of Brageneset, Nordaustlandet, Spitsbergen. *Norsk Polarinstitut. Skrifter*, Nr. 109, 1957, 37 p. [Results of investigations during Oxford University expedition, 1955: stone orientation measurements of tills, raised beaches, marine shells, geological and glacial history.]
- EBERS, EDITH. *Vom grossen Eiszeitalter*. Berlin, Springer-Verlag. [c1957]. 138 p. (Verständliche Wissenschaft, Bd. 66). [History of ice ages.]
- EMBLETON, C. Late glacial drainage in part of north-east Wales. *Proceedings of the Geologists' Association*, Vol. 67, Pts. 3-4, 1957, p. 393-404.
- GALLOWAY, R. W. Rides de façonnement glaciaire sur une moraine de fond dans le Lyngsdal (Norvège septentrional). *Revue de Géomorphologie Dynamique*, An. 7<sup>e</sup>, Nos. 11-12, 1956, p. 174-77. [Types and mode of formation of ground moraines, Lyngen peninsula, north Norway.]
- GJESSING, J. Om iserosion, fjorddal- og dalendedannelse. *Norsk Geografisk Tidsskrift*, Bd. 15, Ht. 5-6, 1956, p. 243-69. [Glacial erosion and formation of fjord valleys and valley ends. English summary.]
- HOPPE, G. Problems of glacial morphology and the ice age. *Geografiska Annaler*, Årg. 39, Ht. 1, 1957, p. 1-18. [Formation of "washboard moraines", "hummocky moraine landscape" and ice-dammed lakes. Based on investigations in Sweden and Svalbard.]
- OKKO, V. Glacial drift in Iceland. Its origin and morphology. *Acta Geographica*, 15, No. 1, 1956, 133 p. [Transportation of all kinds of deposits by glaciers and resulting land forms.]
- PORTMANN, J. P. L'orientation préférentielle des galets dans les moraines récentes du glacier de Moiry (Valais). *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 3, Ht. 3, 1956, p. 313-16. [Measurement of stone orientations in side and end moraines and on glacier surface itself.]
- SVENSSON, H. Plastic casts in the examination of glacial striation. *Geologiska Föreningens i Stockholm Förhandlingar*, Bd. 79, Ht. 4, 1957, p. 781-84. [Methods of reproducing striae.]
- WEST, R. G. Notes on a preliminary map of some features of the drift topography around Holt and Cromer, Norfolk. *Transactions of the Norfolk and Norwich Naturalists' Society*, Vol. 18, Pt. 5, 1957, p. 24-29. [Description of outwash plains, ice marginal features and periglacial features in this area.]
- WEST, R. G., and DONNER, J. J. The glaciations of East Anglia and the East Midlands: a differentiation based on stone-orientation measurements of the tills. *Quarterly Journal of the Geological Society of London*, Vol. 112, Pt. 1, 1956, p. 69-91.
- WEYL, R. Eiszeitliche Gletscherspuren in Costa Rica (Mittelamerika). *Zeitschrift für Gletscherkunde und Glazialgeologie*, Bd. 3, Ht. 3, 1956, p. 317-25. [Observations of cirques, moraines, U-shaped valleys in Costa Rica down to an altitude of 3350 m.]

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

- ALBERTINI, R., and others. *Studi sui fenomeni crionivali (periglaciali partim) nelle Alpi Italiane*, [by] R. Albertini, R. Amedeo, C. F. Capello, F. Dona, V. Giacomini, A. Giorcelli, C. Origlia, A. Pietracaprina. *Presentazione di G. Nangeroni*. Parma, Officina Fresching, [1955]. 149 p. (Fondazione per i problemi montani dell'arco alpino, Milano, Pubblicazione No. 11.) [Collected papers on observations of periglacial phenomena in the Italian Alps; mainly frost action on superficial deposits.]
- BLACK, R. F. Permafrost as a natural phenomenon. (*In The dynamic north. Book 2, chapter 1.* Washington, D.C., Chief of Naval Operations, 1956, 25 p. (OPNAV PO3-13.)) [Properties; distribution; biological and engineering significance; practical applications.]
- GANDAUH, R., and BERGAU, W. Two methods for measuring the frozen zone in soil. *Proceedings of the Fourth International Conference on Soil Mechanics and Foundation Engineering, London, 1957*, Vol. 1, London, 1957, p. 32-34. [Description of apparatus; (a) tube of water measures depth of 0°C isotherm, (b) electrical resistance measures depth of frozen ground.]
- JUMKIS, A. R. The soil freezing experiment. (*In Factors influencing ground freezing.* Washington, D.C., Highway Research Board, 1956, p. 150-65. (Bulletin 135.)) [Laboratory experiment to demonstrate where and how ground-water is transferred on freezing of soil.]
- LACHENBRUCH, A. H. A probe for measurement of thermal conductivity of frozen soils in place. *Transactions. American Geophysical Union*, Vol. 38, No. 5, 1957, p. 691-97. [Accuracy within 5%. Used *in situ* on frozen and thawed soils, snow, fresh water ice and sea ice.]

- LLIBOUTRY, L. Chile: Studia kriopedologiczne w Andach środkowo-chilijskich [Chile: cryopedological studies in the Andes of central Chile]. *Biuletyn Peryglacjalny [Periglacial Bulletin]*, Nr. 5, 1957, p. 5-10, 141-46, 275-79. [Short description of phenomena observed in central Chile. French translation p. 141-46, Russian translation, p. 275-79.]
- PENNER, E. Soil moisture movement during ice segregation. (*In Factors influencing ground freezing*. Washington, D.C., Highway Research Board, 1956, p. 109-23. (Bulletin 135.)) [Laboratory experiments to measure moisture flow rates to freezing zone of various soil samples. Also reprinted by National Research Council (Canada) as NRC 4278.]
- TSYTOVICH, N. A. The fundamentals of frozen ground mechanics (new investigations). *Proceedings of the Fourth International Conference on Soil Mechanics and Foundation Engineering*, London 1957, Vol. 1, London, 1957, p. 116-19. [Summary of recent Russian work on physics of frost-heaving and on shearing resistance of frozen soil and consolidation of thawing soil.]
- TSYTOVICH, N. A., ed. O fizicheskikh yavleniyakh i protsessakh v promerzayushchikh, merzlykh i ottaivayushchikh gruntakh (nekotoryye obobshcheniya) [Physical phenomena and processes in freezing, frozen, and thawing soils (some generalisations)]. *Materialy po Laboratornym Issledovaniyam Merzlykh Gruntov [Material on Laboratory Investigations of Frozen Soils]*, Sbornik 3, 1957, p. 5-114. [General principles deduced from study since discovery that frozen soil contains water.]
- TSYTOVICH, N. A., ed. Issledovaniya po otdel'nyim voprosam fiziki i mekhaniki merzlykh gruntov [Investigations of various questions of the physics and mechanics of frozen soils]. *Materialy po Laboratornym Issledovaniyam Merzlykh Gruntov [Material on Laboratory Investigations of Frozen Soils]*, Sbornik 3, 1957, p. 115-321. [Collected papers on physical and mechanical properties of freezing, thawing, and frozen soils.]
- TURNER, K. A., jr., and JUMIKIS, A. R. Subsurface temperatures and moisture contents of six New Jersey soils. (*In Factors influencing ground freezing*. Washington, D.C., Highway Research Board, 1956, p. 77-108. (Bulletin 135.)) [Relation to frost action.]
- VYALOV, S. S., and SKIBITSKIY, A. M. Rheological processes in frozen soils and dense clays. *Proceedings of the Fourth International Conference on Soil Mechanics and Foundation Engineering*, London 1957, Vol. 1, London, 1957, p. 120-24. [Experimental work and theory.]
- WILLIAMS, P. J. Some investigations into solifluction features in Norway. *Geographical Journal*, Vol. 123, Pt. 1, 1957, p. 42-58. [Results of field measurements.]

## METEOROLOGICAL AND CLIMATOLOGICAL GLACIOLOGY

- GRESSEL, W. Über die meteorologischen Verhältnisse in der Eisriesenwelt von Juni bis September 1955. *Die Höhle*, 8 Jahrg., Ht. 2, 1957, p. 45-48. [Study of effects of meteorological conditions on meteorology at the ice-cave Eisriesenwelt and formation and melting of ice formations.]
- MAIER, W. Hagelsteine und Achsenlage von Gewitterwirbeln. *Meteorologische Rundschau*, Jahrg. 10, Ht. 2, 1957, p. 58-62. [Structure of hail-stones related to their path in storm cloud. Some experiments.]
- PLUVINAGE, P., and TAYLOR, G. La température de l'air dans les premiers mètres au-dessus de l'inlandsis groenlandais. *Annales de Géophysique*, Tom. 12, No. 2, 1956, p. 157-66. [Results of regular observations made from 0 to 3 m., chiefly at "Station Centrale" March-July 1950.]
- SJÖDIN, E. Meteorological observations on the Mikka glacier in the Sarek massif, Swedish Lapland, during the summer of 1956. *Geografiska Annaler*, Årg. 39, Ht. 1, 1957, p. 54-83.

## SNOW

- GERDEL, R. W. The storage and transmission of water in snow. *Eastern Snow Conference. Proceedings*, Vol. 2, 10th Meeting, 1953 and 11th Meeting, 1954, [pub. 1955?], p. 17-21. [Instrument to detect water content of snow by measuring dielectric constant; its use to measure rate of water transmission in snow for different snow densities. Previously published with slightly different title in *Transactions. American Geophysical Union*, Vol. 35, No. 3, 1954, p. 475-85.]
- HOSLER, C. L., and others. On the aggregation of ice crystals to form snow, by C. L. Hosler, D. C. Jensen and L. Goldshlak. *Journal of Meteorology*, Vol. 14, No. 5, 1957, p. 415-20. [Laboratory experiments with colliding spheres of ice.]
- KREBS, C. Snesmeltningslaviner. *Grønland*, 1957, Nr. 7, p. 278-79. [Snowslides of unusual type in West Greenland (influence of melt-water).]
- LLIBOUTRY, L. Discussion of "Report of the Committee on Snow 1954-55" by Robert A. Work and others. *Transactions. American Geophysical Union*, Vol. 38, No. 1, 1957, p. 114-15. [Theory of micropenitents on snow cover.]
- TOLANSKY, S. Symmetry of snow crystals. *Nature*, Vol. 181, No. 4604, 1958, p. 256-57. [Theory to account for regular symmetry of snow crystal by assuming it to be a mechanically vibrating flat plate.]
- WILLIAMS, G. P. A field determination of free water content in wet snow. *Proceedings. Western Snow Conference, Penticton, British Columbia, 1956*, Vol. 24, 1956, p. 16-20. [Field method of determining free water content by compacting and measuring density.]
- YEVEYEV, S. A., and KOTLYAKOV, V. M. Snezhnyye fontany v Antarktide [Snow fountains in Antarctica]. *Priroda [Nature]*, 1957, No. 9, p. 118. [Several "fountains" of snow observed issuing from blow-holes in crevasses in region of Mirnyy.]

## ERRATA

- Journal of Glaciology*, Vol. 2, No. 20, 1956. Page 774, line 51, delete [*sic, i.e.* S. Steinemann]
- Journal of Glaciology*, Vol. 3, No. 23, 1958. In the paper "Movement observations on the Greenland ice sheet" on p. 210 in the last line of column 7 in Table I, for 40° 34' 13" read 44° 34' 13".