

silty sands against muds. A new description of the classical section in glacial deposits at the Bay of Nigg, South Cliff, enables significant comparisons to be made with the Tullos sections. The combined evidence from the two localities makes possible certain deductions about the succession of glacial events. It is shown that the fine-grained sediments of Tullos are contemporaneous with the melting of the "second" ice sheet of north-east Scotland. At this time sea-level was about 80 ft. (24 m.) higher than at present. Evidence is given which indicates that the morainic gravels on the high ground flanking the Tullos depression were also a product of the melting of the "second" ice sheet. This is at variance with Bremner's view that these gravels belong to the "third" ice sheet. It is pointed out that the variation in composition of the Nigg Bay boulder clay does not justify the postulation of two ice sheets for its formation. [From author's summary.]

WILSON, JAMES T. and HORETH, JOHN M. Bending and shear tests on lake ice. *Transactions of the American Geophysical Union*, Vol. 29, No. 6, 1948, p. 909.

This paper reports the results of bending and shear tests made on ice from Lake Michigan and on artificial ice so frozen as to have the same crystal orientation. The bend specimens normally failed in tension with an indicated tensile strength of about 200 psi. A marked increase of tensile strength with decreasing temperature was indicated. The shear strength was found to be about 100 psi. No temperature coefficient for shear strength could be detected. Specimens of the ice were studied in polarized light. It was observed that the optic axes of the crystals were usually normal to the surface of refrigeration. The crystal diameters were usually less than one inch. [Author's abstract.]

GLACIOLOGICAL LITERATURE

THIS bi-annual list of glaciological literature aims to cover the scientific aspects of snow and ice in all parts of the world. Attention is drawn to the bibliographies in each number of *The Polar Record* (Cambridge) which aims to cover the significant work dealing with expeditions, research, equipment and conditions of living in the Polar regions. Both journals, however, deal with Polar literature having specific glaciological interest and with general matters of a practical nature such as snowcraft.

Readers will greatly assist the Editor by notifying him of their own, or any other, publications of glaciological interest.

- AHLMANN, HANS WILSON. The Present Climatic Fluctuation. *Geographical Journal*, Vol. 112, Nos. 4-6, 1949, p. 165-95. [Climatological, glaciological, oceanographical, biological and eustatic evidence of present climatic fluctuations, with special reference to Arctic regions.]
- AHLMANN, HANS WILSON. Den nutida klimafuktuationen och dess utforskande. *Norsk Geografisk Tidsskrift*, Bd. 11, Hefte 7-8, 1947, p. 290-326. [Present world climate change and its study. Glacier recession in north and south polar regions.]
- ALBE, E. M. FOURNIER D'. Some experiments on the condensation of water vapour at temperatures below 0° C. *Quarterly Journal Royal Meteorological Society*, Vol. 75, No. 323, 1949, p. 1-14. [Description of apparatus used and experiments made in the investigation of the behaviour of individual condensation nuclei.]
- ALBE, E. M. FOURNIER D'. Condensation of water vapour below 0° C. *Nature*, Vol. 162, No. 4128, 1948, p. 921-22. [Results obtained by ultra-microscopic observation of individual condensation nuclei; suggests that ice crystal formation occurs through condensation and freezing of incipient water droplets rather than sublimation.]
- AMPFERER, OTTO. Geologische Methoden zur Erforschung von Wegrichtungen von abgeschmolzenen Eismassen. *Sitzungsberichte der Wissenschaften in Wien, Mathematisch-naturwissenschaftliche Klasse*, Abt. , Bd. 155, Heft 1 und 2, 1946, p. 34-47. [Direction of ice streams determined by geological observations.]
- ANDRADE, E. N. DA C. Creep of metals and recrystallization. *Nature*, Vol. 16, No. 4115, 1948, p. 410. [Recrystallization during creep produces increased rate of flow in polycrystalline metals.]
- [ANTARCTIC OCEAN: SEA ICE.] Southern ice reports during the years 1946 and 1947. *Marine Observer*, Vol. 18, No. 139, 1948, p. 44-55.
- [ANTARCTIC OCEAN: SEA ICE.] Southern ice reports during the years 1946 and 1947. *Marine Observer*, Vol. 18, No. 140, 1948, p. 114-15.
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- [ARCTIC OCEAN: SEA ICE.] *Bibliography on ice of the northern hemisphere*. Washington: U.S. Hydrographic Office 1945, H.O. Pub. No. 240, xii, 179 pages. (Biblio. for H.O. Pub. No. 550, *Ice atlas of the Northern hemisphere*, 1946, with index of authors, subjects and places added.)
- [ARCTIC OCEAN: SEA ICE.] *Monthly ice charts. Arctic seas. Hudson Bay to Kara Sea. (Revised.)* London, Meteorological Office and Naval Meteorological Branch, 1944, 28 p., 2s. 6d. [Ice conditions during each month.]
- ARMSTRONG, TERENCE. Recent Soviet research on permanently frozen soil. *Polar Record*, Vol. 5, Nos. 35-36, 1948, p. 217-18.
- BADER, HENRI. Theory of non-calorimetric methods for the determination of the liquid water content of wet snow. *Schweizerische Mineralogische und Petrographische Mitteilungen*, Bd. 28, 1948, p. 355-61. [Three field and one laboratory methods are described.]
- BANNON, J. K. Rain making. *Weather*, Vol. 3, No. 9, 1948, p. 261-66. [The seeding of clouds, physical changes in seeded clouds, production of ice crystals, practical possibilities of the method.]
- BESKINE, J. M. Thermic boring. *Forecast* (London), Vol. 10, No. 11, 1948, p. 469-76. [Describes a method of boring by means of a hollow iron lance which burns away in a stream of oxygen passed through it.]
- BRADLEY, CHARLES CRANE. Geologic notes on Adak Island and the Aleutian chain, Alaska. *American Journal of Science*, Vol. 246, April 1948, p. 214-40, illus. maps. [Includes information on glaciation of Adak, from observations made in 1944-45.]
- BROWN, DOUGLAS M. The fourth Neil Douglas Glacier Expedition. *Appalachia*, New Series, Vol. 13, No. 8, 1947, p. 514-17. [Expedition to obtain glacier data for the American Geographical Society visited the principal glaciers of Prince William Sound, Alaska.]
- CAILLEUX, ANDRÉ. *Études de crypédologie*. Paris, Centre de Documentation Universitaire, Tournier & Constans, 1948, 68 p., illus., diags. [Comprehensive account, based mainly on western European and American studies.]

- CARRUTHERS, R. G. The secret of the glacial drifts. *Proceedings Yorkshire Geological Society*, Vol. 27, Part 2, 1946, p. 43-57; Part 3, 1948, p. 129-72. [The north country drifts derive from englacial detritus released by under-melting.]
- CHALLINOR, JOHN. A remarkable example of superficial folding due to glacial drag, near Aberystwyth. *Geological Magazine*, Vol. 84, No. 5, 1947, p. 270-72.
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- DEBENHAM, FRANK. The problem of the Great Ross Barrier. *Geographical Journal*, Vol. 112, Nos. 4-6, 1949, p. 196-218. [Possible origin and regime of the shelf ice in the Ross Sea.]
- DENIZOT, G. Les relations fluvioglaciales en bordure des Pyrénées centrales. *Compte Rendu Sommaire des Séances, Société Géologique de France*, Nos. 11-12, 1948, p. 216-17.
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- DEVIK, OLAF. Supercooling and ice formation in open waters. *Geofysiske Publikasjoner*, Vol. 13, No. 8, 1942, p. 1-10. (Ice Studies I.) [The supercooling of water plays a part in ice formation, transient in still water, but of lasting importance in running water.]
- FAEGRI, KNUT. Brevvariasjoner i Vestnorge i de siste 200 år. *Naturen* (Bergen), Nr. 7-8, 1948, p. 230-43. [Variations in the glaciers of western Norway in the last 200 years.]
- GOODELL, BERTRAM C. and ROBERTS, KENNETH L. Test of snow-sampling tubes of large and small diameter. *Transactions American Geophysical Union*, 1941, Part 1(B), p. 151-52. [Results of test made in March 1939, on the Merrimack Flood-Control Survey.]
- GRIPP, K. Jasmund und Möen, eine glacialmorphologische Untersuchung. *Erdkunde* (Bonn), Bd. 1, 1947, p. 175-84. [Rügen Island, north Germany.]
- GROISSMAYR, FRITZ BÉLA. Weltwetter und Klimaschwankung im Nordpolargebiet, *Polarforschung*, Jahrg. 15, Heft 1-2, 1945, p. 5-9. [Changes in Polar temperatures in relation to world weather.]
- HAEFELI, R. Schnee, Lawinen, Firn und Gletscher. Bendel, L., ed. *Ingenieur-Géologie*. Wien: Springer. 1948, Bd. 2, [chapter] 10, p. 663-735.
- HAEFELI, R. and KASSER, P. Beobachtungen im Firn- und Ablationsgebiet des Grossen Aletschgletschers. *Mitteilungen aus der Versuchsanstalt für Wasserbau und Erdbau*, E.T.H. Zürich, No. 15, 1948, 12 pages. [Firn temperatures, variations of height of surface, firn speed, creep in ice apron, longitudinal banding.]
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- KIRK, T. H. Ice conditions in the Baltic during the winter 1946-47. *Marine Observer*, Vol. 18, No. 140, 1948, p. 80-92. Maps. [Ice conditions from November to March at selected ports.]
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