

method is described for preparing snow-crystal replicas and for measuring the size and distribution of cloud particles.

GATTY, O., FLEMING, W. L. S., and EDMONDS, J. M. Some Types of Polygonal Surface Markings in Spitsbergen. *Am. Journ. Sci.*, Vol. 240, 1942, pp. 81-92.

A number of measurements of surface polygons in Spitsbergen is recorded and analysed statistically and several new features of polygonal systems are described. A tentative hypothesis of origin of these polygons is put forward to account for the new features. It is not very different from older hypotheses, but throws increased emphasis on the importance of solifluction and vegetation. It is pointed out that deformation of the surface in general occurs when part of the surface is rigid and part of it plastic, and this is the special significance of the freezing point in producing polygonal markings.

OPPENHEIM, VICTOR. Glaciaciones en el Peru. *Revista de la Academia Colombiana de Ciencias Exactas, Físico-Químicas y Naturales*, Vol. 6, Nos. 22 and 23, 1945, pp. 319-21, illustrations.

Observations made in various high ranges of Peru indicate that there are evident remains of three to four glaciations in the Andes of Peru. These vary from levels of 2800 m. which is the lowest, to 4800 m. In this manner the ice from the Pleistocene epoch to the present has retreated approximately 2000 m.

The lowest level of an actual glacier observed, Tullpa Raju, in the Cordillera Blanca, is 4300 m. Remains of human buildings prove that more than 500 years ago man inhabited the same region at higher altitudes, which indicates the unequal and sporadic movement of the ice, depending not only on climatic conditions but also on certain factors yet little known to modern geology and climatology.

ROGSTAD, OLAF. Jostedalsbreens Tilbakegang. *Norsk Geografisk Tidsskrift*, Bind 8, Hefte 8, 1941, pp. 273-93.

In this paper an attempt has been made to determine the decrease of the glacier volume of Jostedalsbreen during the last forty years, as based on a comparison of the hydrographic researches in some watercourses and the published measurements of the length of glacier tongues. There is an English summary of three pages.

ROGSTAD, OLAF. Väre Breers Tilbakegang. *Norsk Geografisk Tidsskrift*, Bind 9, Hefte 4, 1942, pp. 129-57.

This paper sets out to determine the decrease of the glacier volume of Svartisen and Folgefonna in a similar way to that for Jostedalsbreen. In this connection an investigation has been made of the effects upon the regulated water supply in Glomfjord Power Station by the decrease of Svartisen. There is an English summary of five pages.

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 aim 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.

A few copies of some of the works marked with an asterisk in Vol. 1, No. 1, 1947, are still available for distribution.

AHLMANN, H. W:son. The Styggeidal Glacier in Norway. *Geografiska Annaler*, Årg. 22, Häft 3-4, 1940, pp. 95-130. [Climatological aspects, regime, etc., 1919 to 1939.]

AHLMANN, H. W:SON and ERIKSSON, BACKA E. Revet Station and the Fröya Glacier, North-east Greenland, in 1939-40. *Geografiska Annaler*, Årg. 28, Häft 3-4, 1946, pp. 227-57. [Detailed account of the glacier regime: general conclusions on the influence of deposited water upon a glacier regime.]

ANDRADE, E. N. DA C. Metal Crystals and Metal Strength. *Proc. Royal Institution of Gt. Britain*, Vol. 33, Part 2, 1947, pp. 237-50. [Characteristics of metal crystals, some of which are of glaciological interest.]

BARNES, LYNN C. Permafrost; a Challenge to Engineers. *Military Engineer* (Washington, D.C.), Vol. 38, No. 243, 1946, pp. 9-11.

BILLWILLER, R. Der Firnzuwachs pro 1945-46 in einigen schweizerischen Firngebietten. XXXIII Bericht der Zürcher Gletscherkommission. *Vierteljahrsschrift der Naturf. Gessellschaft in Zürich*, Jahrg. 91, 1946, pp. 268-71. [Firn economy in some Swiss glaciers.]

- BLANCHARD, J. Remarques sur diverses théories récentes concernant les climats glaciaires. *Bull. Société Préhistorique Française*, Nos. 1-3, 1944, 4 pp.
- BORDE, J. Skispitz-Lawinenschaufel und Skistock-Sondierstange. *Die Alpen*, Part 2, 1942, pp. 377-78. [Implements useful for snow research and for diagnosis of avalanche danger.]
- BORN, MAX. Elastic Constants of Ice. *Nature*, Vol. 158, No. 4023, 1946, pp. 830-31.
- BROGGI, JORGE A. La desglaciación andina y sus consecuencias. *Rev. Cienc., Lima*, No. 444, 1945, pp. 159-73. [Observations indicating that there is a progressive deglaciation in the Chilean Andes from south to north, due probably to decrease in precipitation and not to temperature changes.]
- BROOKS, C. F. Fluffiest Snow. *Blue Hill Met. Observatory, Harvard University*, Reprint No. 10, 1946. [Description of a Wild Snow fall.]
- BRYAN, KIRK. Permanently Frozen Ground. *Military Engineer* (Washington, D.C.), Vol. 38, No. 246, 1946, p. 168.
- BRYAN, KIRK. Cryopedology—the Study of Frozen Ground and Intensive Frost Action, with Suggestions on Nomenclature. *Am. Journ. Sci.*, Vol. 244, 1946, pp. 622-42.
- BUCHER, EDWIN. Bericht über die Tätigkeit des eidg. Instituts für Schnee- und Lawinenforschung im Jahre, 1945-46. *Schw. Zeit. für Forstwesen*, Nr. 2, Jahrg. 1947, 7 pp. [Mentions *inter alia* the large reduction in fatal accidents since the inception of the "Avalanche Service."]
- BUCHER, EDWIN. Réflexions techniques au sujet du problème de la formation des avalanches. *Mitteilungen des Eidg. Institutes für Schnee- und Lawinenforschung*, Nr. 4, 1947, pp. 3-16.]
- BUCHER, EDWIN and SCHILD, MELCHIOR. Schnee und Lawinen im Winter, 1945-46. *Die Alpen*, 1947, pp. 161-8.
- BURGERS, W. G. Growth of "Stimulated Crystals" and the Rate of Nucleation during Recrystallization of Aluminium. *Nature*, Vol. 160, 1947, pp. 398-99. [Suggests the possibility that "nuclear spots" not yet ready to start their growth could be made to do so by touching another crystal which is already growing.]
- BYRD, RICHARD E. Our Navy Explores Antarctica. *National Geographic Mag.* (Washington), Vol. 42, No. 4, 1947, pp. 429-522. [A popular account, well illustrated, of the U.S. Navy Antarctic Expedition 1946-47. Gives photographs and short popular descriptions of vast new glaciers and glacierized areas.]
- CAROL, HANS. Beschreibung einer Gruppe von Gletscherrandklüften am Obern Grindelwaldgletscher (Mit Hinweisen auf die Bedeutung der Gletscherrandklüfte für die glaziologische und glazialmorphologische Forschung). *Mitteilungen der Geographisch-Ethnographischen Gesellschaft in Zürich*, Band 42, 1943-45, pp. 12-51. [The author is the pioneer of the method of the examination of glacial action by penetrating into the glacier by means of crevasses.]
- CAROL, HANS. Beobachtungen zur Entstehung der Rundhöcker. *Die Alpen*, 1943, pp. 173-80. [A new theory to account for *roches moutonnées*. See article in *Journ. Glaciology*, Vol. 1, No. 2, 1947, pp. 57-59.]
- CAROL, HANS. Ueber einen Versuch, den Gletscheruntergrund mittelst Einstiegs durch ein Strudeloch zu erreichen. *Die Alpen*, 1945, pp. 180-84. [An attempt to penetrate into the interior of a glacier by means of a glacier pot-hole.]
- CHAMPION, D. L. The Frequency and Duration of Snowfall in Great Britain. *Weather*, Vol. 2, 1947, pp. 99-101. [At a mean monthly temperature of 25° F. snow normally lies the entire month: at 32° F. for half the month, and at 45° F. it does not lie for a single day.]
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- ENEQUIST, G. Isälvsavlagringar i Luledalen nedanför Hednoret. *Geografiska Annaler*, Årg. 28, Häft 3-4, 1946, pp. 135-226. [Glacial morphology of Luledalen, northern Sweden.]
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