ABSTRACTS

HOWARD, ARTHUR D. The Preservation of Antarctic Ice Specimens. *Journ. Geology*, Vol. 56, No. 1, 1948, p. 67–71.

Small ice specimens, including thin sections and delicate ice crystals, were brought back intact from the Antarctic. The samples were kept in airtight containers and were stored in a cold-storage room aboard ship during the journey home. Thin sections were housed in slide boxes in which the sections rested horizontally. Immersion of the sections in kerosene to prevent evaporation was not entirely satisfactory because of the tendency of the kerosene to penetrate the section. However, such penetration can be prevented. The use of cover glasses with a seal of vaseline around the edges was found by European glaciologists to prevent evaporation. Specimens other than thin sections were packed in snow. The snow prevented jostling and served as an insulating medium.

The feasibility of transporting small specimens of ice over distances of thousands of miles in journeys involving months should encourage more comprehensive sampling of ice terrains. Furthermore, if detailed ice studies are impracticable in the field because of insufficient time, lack of necessary equipment or lack of specialized personnel, specimens can be returned home for study.* [*Author's abstract.*]

†HOLMES, CHAUNCEY D. Hypothesis of Subglacial Erosion. *Journ. Geology*, Vol. 52, No. 3, 1944, p. 184–90.

Belief that ice at the base of thick glaciers is too plastic and likely to contain too much intergranular melt water for effective plucking of underlying rock leads to the hypothesis that pressure-controlled freezing of small amounts of melt water in joints immediately beneath the glacier has been a significant factor in the vast amount of subglacial block removal that has evidently occurred. Outward flow of glacier-derived ground water is believed adequate locally to remove geothermal heat which otherwise would prevent freezing below the floor level. The floor rock serves to store and to release heat as the pressure melting point shifts. Any freezing beneath a joint-bounded block tends to lift it and to permit ice and debris to wedge around and beneath it.

Roches moutonnées are a logical consequence of extensive operation of the process, and numerous recorded instances of other types are believed also to illustrate the principle. [*Author's abstract.*]

†HOLMES, CHAUNCEY D. "Pavement-Boulders" as Interglacial Evidence. *Am. Journ. Science*, Vol. 242, 1944, p. 431–35.

"Pavement-boulders," either singly or in groups, may indicate major or minor erosional interludes interrupting the progressive accumulation of subglacial till. The interpretation of faceted stones in general is involved and deserves careful consideration. Especially, striae of the pavement-boulder type should be distinguished from striae engraved on a stone during transportation. The common interpretation of true facets as originating largely during transportation is believed to be erroneous. Rarely a single-faceted boulder may afford basis for broad interpretation.

[*Author's abstract.*]

†HOLMES, CHAUNCEY D. Kames. *Am. Journ. Science*, Vol. 245, 1947, p. 240–49.

Critical evaluation of the term *kame* should include recognition of the fact that, originally a colloquial word, it came gradually into scientific use at a time when Pleistocene glacial study was a comparatively new field. Despite assertions to the contrary, by 1895 the term had become adequately defined, and its use in the literature since that time has been far too profitable to merit either abandonment or drastic revision. Recognition of various modes of origin for kames gives opportunity to use variety names if desired. But as most of the postulated modes of origin include a large element of theory (or hypothesis), scientific interests will be best served by employing a conservative terminology in keeping with the sound field evidence. [*Author's abstract.*]

KLEIN, G. J. Method of Measuring the Significant Characteristics of a Snow-cover. *Canada. National Research Council, Associate Committee on Soil and Snow Mechanics*, N.R.C. Report No. MM–192 [1946], 38 pp.

Snow is a material the properties of which vary considerably. The conditions and features of the snow which determine its properties are discussed and standardized methods and instruments for measuring these characteristics are described. The principal applications of the measurements are: (*a*) snow-cover surveys for obtaining data on snow conditions in different localities, and (*b*) performance trials of winter equipment in which it is desirable to define the snow conditions that occur during the trials. The report includes a snow nomenclature and general information on snow which may be helpful to observers. [*Author's abstract.*]

KLEIN, G. J. Snow-cover Measurements. Supplement to Report No. MM–192. *Canada. National Research Council, Associate Committee on Soil and Snow Mechanics*. N.R.C. Report No. MM–202, 1947, 14 pp.

The value of snow-cover surveys has been clearly shown by the excellent results obtained in the trial survey of the winter of 1946–47. No other snow survey has been so complete and the information which has been gained will certainly find many useful and important applications.

Experience in 1946–47 has shown that the method given in Report MM–192 is very satisfactory, but that the Report did not give sufficient detail in a few sections. The purpose of this "Supplement" is to correct this deficiency and to

* See note on p. 191.

† Reprint in possession of the Society can be seen on application.

give further guidance to the observers. Only a few minor changes in the method have been made. Where there are differences between Report MM–192 and this "Supplement," the instructions in the "Supplement" should be followed. The "Supplement" also serves as an interim report to the observers. [*Author's abstract.*]

BROOKS, C. E. P. Unsolved Problem of Climatic Change. *Met. Magazine*, Vol. 76, 1947, Part 1, p. 126–29; Part 2, p. 147–51.

Part 1 gives a table showing geological successions and the climate which accompanied them. After discussion of various geological ice ages in greater detail the more recent glaciations and finally the climate in historical times are dealt with. The conclusion to Part 1 is that "The whole picture is one of an intricate series of superposed climatic variations, from gigantic swings over millions of years between ice ages and genial climates, all down the scale to changes of a few degrees between one decade and another and finally from year to year."

Part 2 briefly discusses some of the theories put forward to account for these changes, including those of Simpson, Milankovitch, Zeuner, Wegener, Arrhenius, Hauswitz and others. The final conclusion reached is that no single cause can explain all the geological changes of climate and that the probable solution of the problem lies in a combination of causes. [*G. S.*]

CHALMERS, J. ALAN. The Capture of Ions by Ice Particles. *Quart. Journ. Roy. Met. Soc.*, Vol. 73, Nos. 317–18, 1947, p. 324-34.

The application of Wilson's process of ion capture by falling drops is extended to the case of ice particles and it is shown how the results differ from those with water drops. Although ice particles in clouds can operate in Wilson's process, arguments are given against this being the agency by which the separation of charge occurs in clouds. [*Author's abstract.*]

WALKER, GILBERT. Arctic Conditions and World Weather. *Quart. Journ. Roy. Met. Soc.*, Vol. 73, Nos. 317–18, 1947, p. 226–56.

A considerable amount of work has from time to time been devoted to the relations between ice in the arctic regions and European weather; but during the past thirty or forty years the mechanism of control seems to have changed fundamentally and this paper represents a preliminary effort to find out what relations have been holding during recent years. Some of the anomalies of arctic relationships are traced to slow surges lasting, say, four to twelve years, and the effects of these can be largely got rid of by taking departures from smoothed curves.

An attempt has been made to provide a satisfactory series of annual values of the arctic pack ice that drifts across the Greenland Sea and to correlate it with conditions of pressure and temperature in Europe. Relationships of the ice with previous conditions are closer than those with subsequent ones, and lead to a forecast for which $R=0{\cdot}66$, a value too small for ordinary use.

For the ice off the Newfoundland Banks the data are more complete but more baffling. The coefficients of $-0{\cdot}76$ and $-0{\cdot}70$ of this ice with previous pressure in Iceland and Greenland, based on over twenty years, have become small and positive; some relationships with European weather are found and an attempt to derive an alternative method of forecasting meets with but limited success.

The fundamental change in the relationships which occurred about 1905 must be physical in origin, such as a big increase in the amount of ice from the west by comparison with that from the north. For a strengthening of the westerly current we should expect lower pressure along the north Canadian coast with higher pressure inland; and data from Barrow far away to the north-west for 1922 to 1940 fit well with this interpretation. [*Author's abstract.*]

RAMSLI, GUNNAR. The Last Ice Age in the Gudbrandsdal Mountains. Some Phenomena illustrating its Stages. *Norsk Geografisk Tidsskrift*, Bind 11, H. 5–6, 1947, p. 253–56.

The last ice age started with local glaciation. At this initial stage the corries in Rondane and Sølenfjell received their final forms. In southern Norway, Jotunheimen was probably one of the first great centres of glaciation. The probable transport of an erratic boulder across the 1800 m. col in Rondane is believed to have taken place when the inland ice still had its divide near the western mountains. This marked the dimensions of the Jotunheim ice flow. Later Jotunheimen must have remained the centre of glaciation. Even in the finiglacial stage, when all ice to the east was stagnant and waning, there is evidence of renewed activity in the local glaciers (K. M. Strøm).

In Atnedal, east of Rondane, there is a lateral moraine of very large boulders at 1050 m. below Storsvulten. This moraine may be due to a slight renewal of activity of the plateau glacier over Ringebufjellene feeding the Atnedal tongue. This glacier was undoubtedly dead, but an accumulation of snow may have resulted in some extrusion flow taking place in the Atnedal tongue. [*From author's abstract.*]

KLEIN, GEORGE J. The Snow Characteristics of Aircraft Skis. *Canada. National Research Council, Division of Mechanical Engineering, Aeronautical Report* AR–2, 1947, 17 pp.

A large number of measurements of adhesion and sliding resistance were made on approximately half-scale model aircraft skis of various shapes and surfaced with various materials. The tests were carried out over a large range of temperature and snow conditions and over a large range of unit loading. Highly loaded skis, surfaced with bakelite and having a comparatively high aspect ratio (the ratio of length of ski bottom to its breadth), and a small bow angle are shown to be much superior to present-day aircraft skis. A theory is proposed which agrees very well with the results of the tests. [*From author's abstract.*]