

## NOTES

### METEOROLOGICAL RESEARCH AT LAKE HAZEN, 1961

During the International Geophysical Year observations of the surface weather were made at Lake Hazen, Ellesmere Island, N.W.T., Canada; they indicate that considerable differences exist between conditions at this inland site and the nearest coastal weather stations Alert and Eureka<sup>1</sup>. In particular, there is an unusual prevalence of calms and an almost complete absence of winds over 20 m.p.h. To investigate this phenomenon in more detail a series of pilot balloon observations was made at Lake Hazen during the summer of 1961.

The writer, assisted by David Feather of Cambridge University, was enabled to join the 1961 phase of "Operation Hazen" through the courtesy of the Defence Research Board of Canada. Financial assistance was obtained from the Banting Fund through the Arctic Institute of North America, and instruments were lent by the meteorological services of the United States and Canada.

Helium-filled balloons were tracked visually by the single-theodolite method to provide data on winds up to 25,000 feet. Cloud conditions were not ideal, but adequate data were obtained for the critical layer below 6,000 feet. Balloons were released at 6-hourly intervals from May 16 until August 18. During the first half of August ten balloons were released each day and the value of this detailed series was increased by almost cloudless conditions during much of the period. Preliminary results indicate that the quiescent surface conditions normally extend to a height of several thousand feet.

To provide comparison with IGY data regular surface weather observations were made during the entire period. Other work included collection of plankton samples from Lake Hazen (for Dr. I. A. McLaren of the Fisheries Research Board of Canada), and of specimens of *Salix arctica* for growth-ring studies. Physiological experiments were also carried out at the request of Dr. M. Lobban (U.K. Medical Research Council).

The writer desires to express his gratitude to the sponsors of the expedition and also to his field assistant, whose help was invaluable. A detailed analysis of the results will be published later.

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<sup>1</sup>Jackson, C. I. 1959, 1960. The Meteorology of Lake Hazen, N.W.T. Defence Research Board, Hazen 8, 9, Parts I-IV, 295 pp.

### UNIVERSITY OF ALASKA GULKANA GLACIER EXPEDITION 1961

Glaciological studies initiated during the summer of 1960 on Gulkana Glacier in the central Alaska Range by members of the Department of Geology, University of Alaska, were continued during the summer of 1961. The program is being supported by a grant from the National Science Foundation awarded to Dr. Troy L. Péwé, project supervisor and head of the Department of Geology.

Gulkana Glacier lies on the south side of the Alaska Range about 4 miles east of the Richardson Highway and about 135 miles southeast of Fairbanks. The two-man field parties, each led by

a graduate student of the University of Alaska, were in the field from June 1 to September 1. The two field parties made, respectively, a detailed ablation study and a study of the surface motion.

Liberal helicopter support was furnished by the U.S. Army, Fort Greely, Alaska. The U.S. Air Force Arctic Aeromedical Laboratory, Fort Wainwright, Fairbanks, the Civil Engineering Department and the Geophysical Institute of the University of Alaska, the U.S. Geological Survey, Fairbanks, and the U. S. Weather Bureau, Anchorage, Alaska generously provided scientific equipment.

#### **Ablation and meteorological studies**

Larry Mayo led the party that concentrated on detailed mapping of ablation and accumulation, and recording local weather and net total radiation. Seventy-nine ablation poles and twenty-five snow pits were used to measure ablation and accumulation on the 3.5-mile-long glacier. Continuous weather observations were made for 3 months. The main weather station was located near the centre line of the glacier at an altitude of 4,800 feet. Every 12 hours measurements were made of wind, precipitation, and ablation on snow, ice, and morainal surfaces. Continuous records were made of temperature, humidity, and net total radiation. A Suomi-type, net total radiometer and a Brown recording potentiometer were powered by a Universal 1.5 kw. portable gasoline generator. A second weather station for continuous temperature measurements was at an altitude of 5,600 feet on the glacier.

#### **Motion studies**

Seventy-five of the ablation stakes were used in the surface motion study. This part of the program was led by Eugene Moores and consisted of the following: (1) an overall program of locating weekly, monthly, and bi-monthly the position of all 75 stakes, (2) short-interval studies consisting of daily observations of seven stakes and 2-day observations of 32 stakes, (3) resurvey of the tranverse profiles established in 1960, (4) extension of the

triangulation net, and (5) locating stakes in the tributaries feeding the main ice streams. The short-interval studies concentrated on an area below the ice fall extending across the width of the glacier, including two stakes on different blocks at the top of the ice fall. Differential motion between ice streams was also investigated.

#### **Geophysical measurements**

Gravity measurements were made along one longitudinal and three transverse lines on the glacier. The measurements were made by Paul Sellmann, Department of Geology, University of Alaska, with co-operation of Ned Ostenson, University of Wisconsin.

TROY L. PÉWÉ

### **HOURLY AIR AND NEAR-SURFACE SOIL TEMPERATURES AT RESOLUTE, N.W.T.\***

#### **Introduction**

Since 1959 the Geographical Branch of the Canada Department of Mines and Technical Surveys has been pursuing a program of enquiry into problems of periglacial geomorphology at Resolute, N.W.T. (74°43'N., 95°59'W.)<sup>1,2</sup>. This area was considered suitable because it is in an active periglacial region, where geomorphological processes are reduced to as near a mechanical process as can be found in nature, since there is an almost complete absence of vegetation.

The study of soil temperature in the active layer of permafrost has formed a significant part of the program. In the past freeze-thaw cycles have received special consideration as continued freezing and thawing of the mantle has been considered instrumental in its disintegration. The Resolute program also included the study of freeze-thaw cycles and in the course of this study temperature data were collected at five levels at 4-minute intervals during the period from October 1959 to September 1960 inclusive.

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