

## GLACIOLOGICAL RESEARCH IN CHINA

IN October 1961, this *Journal* (Vol. 3, No. 30, p. 1157) carried a note on the utilization of melt streams from snow and glaciers for irrigation. We have now received from the Swedish Embassy in Peking, through the courtesy of Professor H. W. Ahlmann, the following account of further work in this connection published by the Chinese news bureau, Hsin-hua (the New China):

Lanchow, Kansu province, 15 September 1963.

China has an estimated area of 44,000 km.<sup>2</sup> of glaciers and permanent snow cover. This was reported to a scientific conference recently held in Lanchow by the glaciological research team of the Chinese Academy of Sciences.

With a total water reserve of 240,000,000,000 cubic metres, these areas account for one-third of the snow and ice cover of the temperate and tropical regions of the world. Since half of China's snow and ice cover is distributed over the arid north-west, the scientists held that the study of the utilization of glaciers to solve the irrigation problem in that part of China was of the greatest importance.

Some of the 70 papers presented at the conference referred to intensified research into the artificial melting of snow and ice, and to use made of the experience of peasants.

Experiments in the Kilien Shan and the Hami district in Sinkiang (Chinese Turkestan) showed that by spreading black matter on snow and ice an additional 10,000 tons of water per day could be obtained from each square kilometre. This meant that ablation was increased by 1 cm./day.

Extensive investigations showed that most of the glaciers in China are small hanging glaciers, cirque glaciers and small valley glaciers. Complex "dendritic" type glaciers, "Turkestan" type glaciers, small ice caps and "armchair" type glaciers were found only in the western Tien Shan, the Karakoram and the Himalayas.

In the study of the development, advance and retreat of glaciers, the glaciologists found that the inland glaciers of China were receding at a slower rate than the "marine" glaciers in other countries.

The ice surface of glaciers of two to ten kilometres in length was found to flow at a rate of 10-30 m./yr.; the rate of melting was less than that of comparable glaciers in temperate latitudes. Most of the rivers in north-western China are fed by glaciers of the Kilien Shan and Tien Shan, and some receive as much as 50-70 per cent of their intake from glaciers.

A flood warning system was worked out for rivers on the northern slopes of the Tien Shan, based on the general circulation and changes of meteorological factors in the upper atmosphere. Measures for predicting floods on the Manass, the largest river north of the Tien Shan, proved accurate in eight out of ten cases, greatly benefiting the farmland and villages on the lower reaches of the river.

Other papers read at the conference covered the physics of ice and snow, former glaciation, periglacial geomorphology, and frozen ground for ordinary and engineering purposes.

The glaciological research team was formed in 1958 by Shih Ya-feng, head of the Laboratory of Glaciers and Frozen Ground, under the Institute of Geography. In that year a group of research workers led by Shih Ya-feng explored the "July the First Glacier", 5,000 m. above sea level in the Kilien Shan. Since then he has been conducting investigation on glaciers and snow-covered mountains every summer, and training young research workers in theory and practice.