111. *Geomorphology of the Japanese High Mountains.*

(*Fourth Report.*)

Nivation Phenomena around the Peak of Sirouma.

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In the summer of 1934, Imamura carried out field examinations around the famous Peak of Sirouma, which towers above the many others in the northern part of the Northern Japanese Alps, and found there various kinds of topographies that could easily be mistaken for real glacial forms presented themselves as the results of nivation—results not in the least surprising, seeing that this region suffers every winter from very heavy snow-falls, as the result of the winter monsoons.

The valley running eastward from the Peak of Sirouma generally has a great deal of snow, even in the mid-summer. On the left wall of this valley, about 1900 m above sea-level, a large rock slab with innumerable striations was reported some time ago (Fig. 1), when eminent geographers like N. Yamasaki and T. Ogawa considered the striations to be of glacial origin.¹⁾ Imamura, however, in the belief that these striations were of nivalational origin, tested the verity of his opinion by means of an experimental method, due in part to a suggestion of

Fig. 1.

1) In Japanese.

S. Yoshimura. In the autumn of 1934, Hirabayashi proceeded to this valley and thoroughly polished off every trace of the striation from a part of the surface of the rock slab (1 m wide), leaving it as smooth as a mirror, with not a single striation visible (Fig. 2).

Fig. 2.

Fig. 3.

About nine months afterward, with the arrival of the alpinist season, on July 7, 1935, Hirabayashi revisited the valley to examine the result of the experiment, when, to his great delight, he found twenty-two new striations distinctly engraved on the rock surface (Fig. 3).

These striations, which exactly follow the direction of the maximum gradient of the slab, have an average width and depth of not less than 1 mm. The hunters in this region say that from the amount of these striations they may roughly estimate the mountain weather during the foregoing winter.

If we were to assume that 10000 years have elapsed since the end of the last glaciation (a rather conservative estimate), we should expect to-day something like 220000 striations in a width of 1 metre, from which it would follow that all the real original glacial striations, had they existed at all on the surface would have been rubbed away.

The above result shows that all the striations on the rock slabs on the Sirouma Peak are certainly nivational that it is impossible to distinguish nivational striations from glacial striations, and the striations alone, however large their number, are no proof of past glaciers in the Ice Age of Japan.