The Editor,
The Journal of Glaciology

SIR, *Melting versus Evaporation in the Sierra Nevada, California*

A project undertaken from the Base Camp of the Sierra Club, high on the east slope of the Sierra Nevada, in California, will have interest for glaciologists. This work is summarized in a report describing studies of run-off from a small isolated snow bank at 12,200 ft. (3718 m.) elevation on Middle Bishop Creek (lat. 37° 10′ N., long. 118° 38′ W.), authored by Gene Serr II, Gene Serr III, and Oliver Kehrlein, members of the Sierra Club. The work was assisted by other members of that organization.

It was desired to test Matthes' earlier statement to the effect that almost all of the snow above 12,000 feet in the Sierra Nevada evaporates so there is little run-off from snow melt at and above this elevation. On 19 July and again on 2 August 1950 the amount of water represented by a selected snow bank was determined by careful survey of its size and density. The amount of run-off was measured over this period through a weir set on bedrock below the snow bank. These measurements showed that approximately 99 per cent of the wastage ran off through the weir, leaving about 1 per cent for evaporation and other losses. These run-off figures were checked and confirmed by measuring the amount of water derived from melting of snow blocks of known size and density under natural conditions. These blocks gave a 97·3 per cent yield on melting.

It is recognized that considerable condensation may have occurred and that for this reason the total run-off is not an exact measure of the amount of melting. Nonetheless, the conclusion appears justified that evaporation was a relatively minor factor in the wastage of this snow bank, for evaporation certainly could not occur while vapor was condensing on the snow, and the total amount of water supplied by condensation need be only a small fraction of that produced by melting. These results strongly suggest that evaporation occupies a relatively minor part in the ablation of snow in areas above 12,000 feet in the Sierra Nevada. This, of course, is in keeping with the relatively insignificant rôle of evaporation in ablation previously determined by Sverdrup and Wallén.

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SIR, *The Cameron Glacier, New Zealand*

I recently visited the Cameron Glacier, a small one in the Arrowsmith Range, Canterbury. It lies about ten miles to the south-east of the glaciers in the upper Rakaia Valley, whose marked retreat I described in a recent issue of the *Journal* (Vol. 1, No. 9, p. 504–7). There is no evidence of appreciable recession of the Cameron since Speight photographed it forty years ago, but it has wasted down by as much as 200 ft. (61 m.), recalling Speight's own observations of the very much larger and better-known Tasman Glacier. In his contribution to No. 8 issue of the *Journal* (p. 422–29), Suggate seems to have established the general character of the minor climatic fluctuations that influence the behaviour of the Franz Josef and Fox Glaciers in Westland, so that one wonders why glaciers descending east of the Main Divide respond differently. I suspect that two factors are important. First, the positions of the terminal faces of the steeper, more rapidly flowing Westland glaciers may fluctuate in response to nett alimentation changes more readily than those of the Canterbury glaciers. Second, cycles of westerly weather bring heavy precipitation on and west of the Divide, but are often accompanied by conditions favouring increased ablation at lower levels on the eastern glaciers. Glaciers such as the Cameron are perhaps at present in a state of temporary equilibrium where alimentation increases at high altitudes are balanced by increased ablation losses at lower levels. However, the marked thinning of the trunk portion of the glacier suggests that stagnation and decay may be imminent. I have written a short account of the Cameron and its bearing on these questions, which is to appear in the *New Zealand Journal of Science and Technology*.

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