

and received a thick coat of loess mixed with talus. Directly in front both valley sides come down to the flood-plain in this fashion. Time enough has elapsed for accumulation of huge deltas and gradual loess-mixed talus-cones, some of them truncated by the river, and the cutting-down of tributary once-hanging glacier valleys to sharp V-sections and canyons on a regular grade to the river since any time when the ice was farther forward than now. As an exception to this it may be said that the glacier is at present in the process of a minor oscillation that makes it about 200 feet short of a cross-ridge of moraine deposited probably some few years ago.

Owing to the depth of its gorge and alpine character of surrounding mountains, the Zerafshan glacier, unlike those of the Trans-Alai and Pamir, is wholly covered with moraine longitudinally banded with the various colors of its different tributary glaciers. But the most significant difference between it and those others lies in its being the only one that yielded no evidence of more than one expansion greater than the present. If the old moraine found half-buried in the alluvial terraces down to 45 miles below the present ice belongs, as seems most likely, to our second epoch, it is easy to understand how that of the first epoch was washed



Fig. 458.—The Zerafshan Glacier.

away by the river during the latter part of the second and early part of the third cycle of erosion. It is not so easy to understand how the fourth erosion cycle could have obliterated third- and fourth-epoch moraines without obliterating that of the second epoch. Indeed, it seems impossible under the conditions involved. There remain two alternatives: either local conditions were such that little if any expansions took place, or the present glacier is greater and obliterates them. But since the glacier is now less than 15 miles long, it seems necessary to assume that there were local reasons why no considerable advance corresponding to those of the third epoch of Trans-Alai and Pamir took place. It seems quite likely that our fourth-cycle uplift of the Zerafshan glacier and its surroundings took place after the third glacial epoch farther east, where glacial conditions may have been accelerated by uplift during or before that epoch. The Zerafshan is now much more actively cutting down than any other large stream met with, and its glacier is advancing* as though the uplift were still in process and accelerating glacial conditions also.

* Excepting the minor oscillation of recent years.