

ately so, and become of great interest as a demonstration of the origin of such nuclei in greater basins. Its wide gravel-plains sloping from the Trans-Alai are strewn here and there with dunes and other areas of loess, while in the lower half of the valley there are sand nuclei several miles in length. Several feet of loess have accumulated over its old moraines and along the lower slopes of its border ranges.

GLACIOLOGY AND EVIDENCES OF MOUNTAIN MOVEMENT.

The glaciology was described in my first report. The same oscillations and the same greater advances and recessions took place here as in the Kara Kul basin. During the two first epochs much of the valley steppe was occupied by wide piedmont ice-flows extending all the way across it from the Trans-Alai. Moraines laid down during the first have lost all topographical characteristics and their worn-down surfaces now form broad, low, transverse undulations of the valley floor and massive foothills of the Trans-Alai. Those laid down during the second



Fig. 439.—Kirghiz making Felt in the Alai Valley

epoch are now spread in the form of broad lobes covering immense areas and made up of vast numbers of conical mounds. In one remarkable instance, a second-epoch glacier spread all the way across the valley, piling up the slope of its northern side, just west of the Kashka Su. Through this moraine the Kizil Su has cut a channel, exposing a section of till resting on alluvium barely above the level of the stream. This section is of especial importance, for it is clear proof that the Kizil Su flood-plain was at about the same level there during the second glacial epoch as it is to-day, and that terraces, which leave the flood-plain about half-way down the valley and attain a height of 300 feet near its outlet, belong to some earlier age.

On a visit to the glacier of the Tokuz Kungei, one of the greater Trans-Alai tributaries to this valley, some ideas were formed about the third and fourth epochs and their relations to the older. This glacier still terminates piedmont fashion, deploying—over a massive accumulation of moraine filling the mouth