

## FORM OF THE GREAT ALAI VALLEY.

## THE VALLEY ITSELF.

Although the dimensions of the Alai Valley have already been given, a repetition seems necessary. It is, except for the flood plains of streams, a smooth, grass-covered plain about 75 miles long, averaging 12 miles in width, and broken by transverse undulations where moraines project from the principal side valleys. It has a longitudinal pitch from 10,500 feet at the pass on the east to 3,200 feet at Darak Kurgan on the west end, and a transverse inclination of about one-half a degree alongside streams from its southern to its northern border. The Kizil Su, or trunk stream, thus flows close to the northern border.

Very few of the side streams coming down from the Trans-Alai, or southern border, reach the Kizil Su, except in high flood. On July 14 we followed the flood plain of the Kizil-Art darya, which is one of the larger streams, from Bor Daba to the Kizil Su. Although there had been three days of rainy weather, all the channels of this stream were dry at 15 versts down from Bor Daba. The lower portions of the flood plains of larger streams from the Trans-Alai are often several versts in width and generally of clean gravel, with certain strips grown over with loess, and rising in the middle to a considerable height above the surrounding plain. These observations, together with the extensive distributary systems as seen on the map, are good evidence of delta accumulation. In the eastern half of the valley the Kizil Su itself is a sluggish stream and incapable of transporting more than a very small proportion of the immense amount of waste supplied by the Alai Valley tributaries. This is shown by the splitting of the stream over long stretches and absence of any permanent channel cut down below the surrounding plain.

We have seen that, in the past, great accumulations of moraine were brought into the Alai Valley, that since the Kurumdi, or later glacial epoch, great depths of moraine of that advance have been buried by later waste, and that the valley is now rapidly filling up with alluvium. A general glance at the valley as a whole would show that it has the character of a formerly deep valley now much filled up with waste. The ledges flanking the mountains on both sides of the valley slope sharply into alluvial and glacial deposits. It would be interesting to know how long this valley has been filling up, what proportion, if any, of this filling took place before the Alai glacial epoch, what proportion between the Alai and Kurumdi epochs, how much since the Kurumdi epoch, and how far down it would be to bedrock in a cross-section. Much light might be thrown on these questions in exposures of the gorge at the outlet to the valley. It seems highly probable that the valley has suffered from morainal blocking. This might explain the existence of the gorge that drains it as a drop-over from the high zone of morainal blocking and consequent alluvial accumulations into lower regions unaffected by glacial action.

## SIDE TRIBUTARIES.

The side valleys emptying into the Alai Valley from the Trans-Alai range have already been described in paragraphs on glacial geology. It was shown that there had been a lowering of baselevel of those streams from the south and consequent cutting