to Semipalatinsk, July 28 to August 2, in several headwater valleys of the Karatal, a river that flows into the mid-southern side of Lake Balkash from the western spurs of the Cis-Ili Ala-tau. Near the village of Kugalinsk (see sheet 12 of the 40-verst Russian map), the northwest slopes of the Chulak range were cloaked with grassy loess and somewhat dissected by small consequent valleys, across which the road had many ups and downs. On the ridge between Kugalinsk and Tzaratzinsk the slopes are strewn with irregular mounds of loess of small relief, in which the roadside cuts were creamy white. The surface was well covered with grass; hay had been cut in places. On the next ridge, which divides the Kok from one of its branches, there was a curious mixture of fresh and hackly ledges and smooth mounds of loess, in which some road-cuts were 10 feet deep. The mounds seemed to have a trend from the northwest or west-northwest, and occurred up to altitudes of 4,000 or 4,500 feet.

Fig. 35.—Diagram of Loess Drifts, near Kara-bulak, looking south.

The valley of the Kusak, near Kara-bulak village, afforded the most significant features, for here the drifted form of the loess became very pronounced. The valley floor, at an altitude of about 2,800 feet, very smooth and about a mile wide, opens westward between long spurs descending from the range on the east. The stream has cut a narrow trench, 20 or 30 feet below the floor, along the base of the northern spur. The current is rapid, with large cobbles on its banks. A few miles to the west the trench opens on a broad, fan-like plain, where the road was very rough from the abundance of rolled stones. The valley-side spurs were covered with loess drifts, hundreds of feet in length, thinly overgrown with herbage, somewhat barkhan-like in form, gracefully convex in their longer ascent from the west and falling off steep to the east; crowded together and overlapping like a school of fish hurrying upstream; more closely packed to the west, and thinning out to the east. Their form is too systematically drawn in fig. 35. The difference between these aggraded drifts and the normally dissected slopes of the spurs of country rock farther up the valley was very striking and suggestive. The latter had all the down-hill lines that indicate the work of ordinary erosive forces, and repeated the ravined forms so familiar elsewhere. The former showed no sign of down-hill grading, but expressed most clearly the sweeping of the wind over their graceful curves. Hence, unlike the deposits near Samarkand and Tashkent, the loess here is of so recent a date as to be unchanneled. It preserves most perfectly its wind-swept form; it may still be growing. The phrase, "wind-swept form," is used because, although the loess drifts are now covered with scanty herbage, the profile of the drifts, gently convex to windward and falling more abruptly to leeward, suggests that the actual motion of the wind has had much to do with shaping them. As to the constitution of the drifts, we had the most convincing evidence while descending across them on the southern side of the valley. An impalpable white dust was raised in a blinding, smothering cloud by our galloping horses and rolling wheels; and the penetrating power of the dust here and elsewhere was