

The Sardai-miona valley has no high terraces, no terraces comparable to those of Kizil Su. It is essentially a simple gorge, beginning with a v shape with low terraces at the bottom, then changing to a canyon and finally opening again to a v shape with low terraces at the bottom. These low terraces which mark its last transition undoubtedly resulted from the recent uplift which faulted up the northern side of the Hissar valley, breaking off the border of its floor with the scarp of loess. The river, which is of nearly clear water, as its region is of crystalline and metamorphic schists, is a rapid and copious flow, but hardly a torrent. Its grade is fairly even, though at intervals it becomes more rapid and passes chutes. It may, therefore, be said that its last phase is still uncompleted.

Any explanation of the Hissar valley must explain why the Kafirnigan with the other streams breaks through its southern side, instead of flowing east to join the Karatagh, thus continuing the valley to its proper outlet. It may be that the Hissar valley is not a valley, but no more than a belt of the Oxus embayment, shut off by uplift of the plain south, and that the Kafirnigan cut down as the mass rose. This is not likely, because the hills south of Hissar are by no means sharp in outline, but are, on the contrary, of mature form. It would seem that a regional tilt, raising the northern side with the Hissar Mountains, would account for the canyons of tributaries there and the cutting back of an Oxus tributary to capture the cross-streams at Hissar. The same process might account for cutting back of the Vaksh to capture the Kizil Su at Obu-garm, thus leaving the Hissar valley from there west without the great stream that belonged to it.

#### TENTATIVE RECONSTRUCTION OF EROSION CYCLES IN KARATEGIN AND HISSAR.

##### First cycle (Pliocene).

Erosion of Pliocene mountains to low relief, while Kizil Su flows straight through the Alai valley, Karategin, and the valley of Hissar, and then south to the Oxus. Cycle closes with valley widening and a many-mile wide flood-plain continuous from the eastern end of the Alai valley to the Oxus embayment, a distance of nearly 500 miles.

##### Second cycle (Quaternary).

High uplift; Hissar region tilted, raising north more than south. The Kizil Su captured at Obu-garm, the valley of Hissar at Hissar; the Kizil Su deepens the western end of the Alai valley and canyons its valley in Karategin; the Sardai-miona develops its canyon cycle. Closes with the valley widening.

##### Third cycle (Quaternary).

High uplift. The Kizil Su deepens the western end of the Alai valley and canyons the second-cycle floor of Karategin to a depth of 2,000 to 3,500 feet below the first-cycle grade plains. Cycle closes with prolonged valley widening and glacial alluviation. Great accumulation of loess.

##### Fourth cycle (Postglacial).

Warped uplift of a few hundred feet. Faulting up of northern side of Hissar valley. Present channels incised in flood-plains of third-cycle alluviation. Now up to 200 or 300 feet in depth and still cutting down. Loess still accumulating.