

clay sediment to form the takyrs (adobe flats). The area occupied by the delta-oasis, or living delta, is proportional to the amount of water available for keeping the dunes in check. It is evident that during a continued decrease in the annual supply of water the delta will die at its borders and the dunes advance, diminishing the area of the oasis. After that, only a long-continued increase in water-supply could recover for the oasis its lost area by burying the bordering dunes in takyr and thus extending the foot of the living delta.

The continued process of aggrading on the three zones of the delta is, therefore, of a very complex nature and dependent on varying factors; at the apex, there remains the greater part of the coarsest material—boulders, cobble, gravel, and coarse sand; the middle zone receives in overflow much of the finer silts; while the rest of the finest silts accumulate on the lowest slopes as far as the dune-barrier; and here, too, as well as beyond in the dune-locked depressions, are deposited the coarse and fine sediments rolled along its bottom or carried in suspension by the stream.

These are the contribution from the mountains. Parallel with this is the contribution from the desert on the north. As we have seen, a part of the sand from the desert is distributed and assimilated by the living delta. Besides this the desert whirlwinds come laden with fine dust, and where this falls on the delta it remains caught in the vegetation, and it, too, enters as a loess-constituent into the delta structure. It is, therefore, clear that the zone of deposition and depression along the base of the mountains is being continually loaded, not only with the products of current destruction of the neighboring mountain masses, but also with materials brought from the desert. And while much of this came originally from the mountains near at hand, much must also have originated in the distant highlands of Afghanistan and the Pamirs.\* Thus it is probable that the load on part of the zone of depression may be greater than that removed from the neighboring mountain masses.

We may extend this analysis still further, to a picture of the internal constitution and structure of the zone of depression as a whole. Ever since Central Asia became a "central region," without efflux of its waters to the ocean, it has necessarily been an area of desert wastes with a climate the aridity of which was tempered probably only during periods of glacial expansion. Of equally long duration has been the activity of the processes I have outlined. Deltas have continually grown up at the mouths of streams emerging from the mountains, and where the streams were separated by short intervals their deltas merged together; where the intervals were greater the sands, as they were stopped in their onward course by the mountain barrier, piled up in hills which rose high above the intervening living deltas.

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\*The Tejend and Murg-ab are rivers of considerable size, which rise in Afghanistan and have sufficient volume and grade to maintain their course farther out onto the desert before spreading out to be lost in evaporation. It is probable that, during a not very remote period of greater precipitation, the Oxus, instead of emptying into the Aral Sea, followed a southerly route to the Caspian, along the so-called Ungus, midway between the Kopet range and the Aral Sea. The Oxus would then have received the waters of the Tejend and Murg-ab with their silts, and its flood-plains would have contributed to the loading of the zone of depression along the base of the Kopet Dagh.