

(B, fig. 72) has not been destroyed by the widening of the valley (Y), this is not because the widening of the valley has been prevented by the lateral encounter of unusually resistant rocks, but because the river spontaneously ceased its destructive work when the lower valley was significantly narrower than the upper valley (V), instead of continuing to widen the lower valley so as to combine the two terraces, A and B, in a single terrace, A'. All the terraces of the two Kugarts and of the Alabuga-Narin Valley, and at least some of those of the Chu system, thus appear to result from successive reductions in the power or in the period of river action. The same holds true in the case of the terraces in the Kopet Dagh, above described. Here, as well as there, it is not likely that the terraces now seen record all of the terrace-making episodes, but only the decreasing maxima in a complicated series. It should also be pointed out that the terraces of New England and of the Tian Shan appear to be of unlike age. Those of New England are eroded in loose sands or clays, and are all of later date than the last glacial epoch. Indeed, their production may have required less than half of post-glacial time, for the valleys in which they were carved were aggraded, after the ice retreated, by the same rivers that are now degrading them; and the existence of the terraces shows that less material has been removed than was previously deposited. The terraces of the Tian Shan, on the other hand, are usually eroded either in rather well knit gravels or conglomerates, as along the two Kugarts, or in partly consolidated sandstones and claystones, as in the Narin formation, while in the Kopet Dagh they are carved in calcareous shales. In all these cases the terrace materials are strong enough to stand up in steep bluffs. None of these terraces are in glaciated valleys. The earlier terracing appears to be much more ancient than the latest moraines in the high mountain valleys. It is therefore quite conceivable that, as Mr. Huntington has concluded, the successive glacial epochs and the successive terracing epochs, each of decreasing intensity, may be synchronous, and may be common results of a series of climatic changes. Whether it is finally proved that the terraces result from climatic changes, or whether the terraces are in part the result of crustal movements, there appears to be good ground for thinking that the time intervals marked by the terraces may be correlated over very considerable distances, and that the time intervals thus established may be eventually placed in the same scale with those indicated by the glacial records; and that thus a good beginning toward the establishment of a Quaternary time scale will have been made.

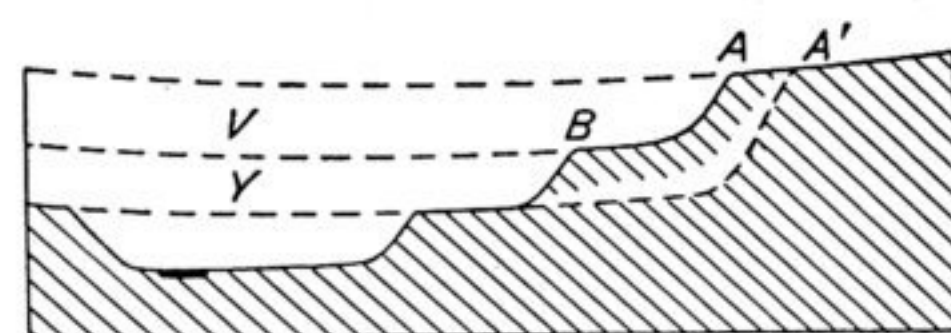


Fig. 72.—Ideal section of Terraces.