

practically closed around by high ranges of the Tian Shan, Pamir, Karakoram, and Altin Tagh, and comes near to an ideal type. But the Western basin, the one most studied by us, still lies open out over the low steppes of Siberia and Southern Russia, with but little protection from the Ust-Urt, or low-domed ending of the Urals. It is, therefore, a basin less isolated and less independent in its variations of climate than Tarim and other divisions of the Gobi. We must expect to find that it was more directly influenced by the Quaternary ice mantle over Russia, as well as by the mundane change that brought about that ice. And, as already hinted, the cyclical uplifting of mountains was by no means simple, but took place in huge block-masses rising and tilting in various degrees and relations.

Other facts not brought out by our imaginary basin, but of marked importance in all large ones, are the disturbances resulting from unequal loading of different areas and the encroachment of mountains on plains by migration of the tilted piedmont belt. This is especially well exemplified in the western part of Tarim, where the strata have been tilted up, forming long ridges several hundred feet high with fault-scarps facing mountainwards and surmounted by gentle slopes towards the center of the basin. There are sometimes several parallel to each other and 30 or 40 miles apart, the innermost youngest in appearance as though migrating from the mountains inwards, stage by stage, to follow the zone of maximum deposition-load as it moved inwards from cycle to cycle. Why this encroachment took place we can only guess, but that guess must fit in perfectly with the whole scheme.

I have spoken of the mountains rising by displacement, and there may have been some doubt as to how that displacement took place. Was it flow in the hard crust of the earth, which is thought to be miles deep? Or was it a displacement in the supposed magma beneath? There has been a prevalent idea that some ranges piled up from overriding folds supplied by horizontal thrusting from both sides, and that others formed by simple folding on lines normal to horizontal compression, thrust in either case arising from a general contraction of the earth and wrinkling of its crust. That such was the primal origin of our Central-Asian ranges may be assumed, as far as this report is concerned. Indeed, the structure of their interior portions would lead to that conclusion. But without entering at all into a discussion of their primal origin, a thing that lies back in one of the earth's great mountain-building epochs, we are still confronted by that series of peculiar secondary movements of a desert basin with its mountains.

Then, to explain the hypothesis of shifting-load displacement hitherto assumed: The plains sank with their load of sediments; of that we have ample proof both in the fault-scarps of high-uplifted blocks along their borders, and in the Askhabad well-boring, 2,200 feet deep, which penetrated the plains to 1,400 feet below the sea-level, and even then remained in red alluvium and loess like that laid down on them to-day. It is absurd to suppose they sank into a cavity; we must assume that matter was displaced. The obvious corollary is that whatever displacement took place was to the nearest zone of weakness of the earth's crust, and there is twofold reason for supposing that the mountains lay over