Formation Mechanism of the High Asia Orogen

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In the previously performed global reconstruction of the stressed state [Rebetsky, 2020], it was shown that the increased level of horizontal compression in continental orogens is not associated with long-range stresses at the plate boundaries, it was also noted that the thrust from the submerged and weighted part of the lithosphere 100 km should be considered as one of the main reasons for the movement of plates. Combining these factors and data obtained in various studies, a model was created that includes several important points: 1) the thickening of the crust under Tibet is not the result of pressure from the Hindustan plate, but is the result of metamorphic transformations and under the continent 2) for the formation of a large orogen in diameter, a mechanism is needed for the flow of fluid, which is a necessary condition for the onset of transformations, over long distances; 3) such a mechanism is the accelerated thrusting of Tibet onto the Hindustan plate as a result of the separation of the paleoslab by the further pulling of the Eurasian platform in the opposite direction; 4) as a result of such movement, a layer of sagging oceanic lithosphere is formed, which flattens along the sole of the continental lithosphere and transfers the processes of transformation of matter further from the future collision zone; 5) after the separation of the slab, the rendezvous process accelerates, which leads to lower fluid losses during the advance of the oceanic lithosphere. The paper presents a model of the formation of the High Asia orogen, which includes three main uplift impulses. The first impulse of uplift, which began about 40 million years ago, is due to the advance of the Tibetan lithosphere towards the Indian Plate due to the pulling forces that appeared as a result of the separation of the paleoslab. The second uplift pulse begins about 14-8 million years ago. This uplift resulted from the exfoliation of heavy fractions of lithosphere rocks, which appeared as a result of the interaction of the fluid-saturated oceanic lithosphere, gently flattened along the lithosphere of Tibet as a result of oncoming movement. The third and largest uplift impulse occurs about 4-3 million years ago, when a finally formed heavy drop at the base of the Tibetan lithosphere breaks off and begins to sink. Data on uplift times correlate with data on volcanism, and the presence of a sinking drop is recorded in seismic tomographic studies.