

## THE PROBLEMS OF THE KORYAK UPLAND TECTONICS

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### ABSTRACT

The result of two decades of imbricated-thrust (collage) structure and constructive tectonogenesis of the Koryak Upland are summarized. Despite that important information has been obtained, paleogeodynamic environments of the progresses of ophiolite formation need further investigation. The primary targets to be considered are Taigonos-Penzin (formation and splitting of island arcs) and Kutin-Ust'-Bel'sky (specification of Triassic paleobiogeographic zoning) regions.

There are three stages in the history of studies of imbricated-thrust structures of the Koryak Upland.

At the beginning of the first stage, the trip of a joint team of geologists from the Geological Institute, Anadyr Expedition of Northeastern Territorial Geological Survey and the Laboratory of Tectonics of the Northeast Interdisciplinary Research Institute was organized in the territory of the Koryak Ridge in summer 1973 (Aleksandrov et al., 1975). The monograph "Sketches of the Koryak Upland tectonics" (1982) was the result of this tour.

The first stage of study was characterized by the accumulation of the primary data. The obtained materials testified to the allochthone occurrence of ophiolites in the imbricated-thrust structure of the region and constructive tectonic style of this region development. There was ardent discussion between the proponents of traditional concepts, i.e. ideas of folded-block structure of the region and intrusive origin of ultrabasites, and representatives of new ideas. At this stage of study new concepts of melanges, olistostromes and ophiolite allochtones were introduced into the geological practice (Aleksandrov, 1973; Aleksandrov, 1978; Byalobzhesky, 1979; Ruzhentsev et al., 1979; Chekhov, 1979). At present, the conception of serpentinite melange is used very often (Geological map of the northeastern USSR, 1980), whereas the idea of olistostromes is not yet recognized by many scientists.

The second stage (in 80-s) was characterized by a thorough study of ophiolite associations in the Koryak region and ophiolite composition by fine analytical methods. The methods of micropaleontology and paleomagnetism were widely used. Some results (detection of ultrabasic lavas, close interrelation of calc-alkalic and tholeiitic magmatism, findings of ancient metamorphic rocks within the ophiolite zones, prolonged magmatism development of these zones and their steep occurrence in modern structure) supported the fixist's ideas (Belyi et al., 1989). Other facts, such as the detection of Tethyan fauna assemblages of Carboniferous-Permian and later-Late Triassic ages (Bychkov, Chekhov, 1979), some paleomagnetic data on the location of separate blocks at the near equatorial paleolatitudes at this time, and the correlation with the terrane collage structures of Canadian Cordilleras and Alaska were considered to be an evidence of the most distant lateral displacements (Stavsky, 1988). However, simultaneously with these extreme ideas, there exists the viewpoint of more moderate (within the marginal seas) amplitudes of horizontal movements.

An active discussion took place at the International Geodynamic Seminar, organized by A.P. Stavsky (Research and Production Association "Aerogeology") in summer 1990. It was held in the field of the Mainitz zone. This seminar was the final step in the extremely fruitful stage of study of the upland imbricated structure.

Over the last years, there appeared more reliable paleomagnetic data (Didenko, 1993). The further deciphering of stratigraphy of siliceous-volcanogenic unit that have the wide age interval (Pz-K), extremely small thickness and imbricated structure was carried out. Imbricated structure of there unit is analogous to those in accretionary prisms of modern island arcs. Marginal-sea and island arc characteristics of magmatic ophiolite occurrences were established instead of typically oceanic petrochemical and petrological ones. All these new data proved the ideas of marginal-sea paleogeodynamic environments in the Koryak Upland (Chekhov, 1992). The ideas of terrane structure of the region both with suspect allochthone plates and blocks and related ones, were developed in

presentations at the IV International Plate Tectonic Meeting, held in Moscow in November 1993. This meeting was devoted to L.P. Zonenshain (Zonenshain, 1993). As to the terrane structure of the region, related allochthonous plates and blocks are the separate parts (zones) of the former marginal-sea basins, which were combined into complex imbricated systems during the collision of island arcs and marginal-continental structures.

Many facts were gathered in favour of such a moderate mobilist viewpoint, including the materials of summer field trip in 1993 on the southern coast of Taigonos Peninsula. These data proved once more the unified structure of ophiolitic belts within the Koryak Upland. On the coast of Taigonos Peninsula, there is a standard complex of the major elements: tuff-terrigenous Triassic-Lower Cretaceous (including Valanginian) autochthon; Hauterivian-Barremian ophiolite-clastic olistostrome; and the main element-complexly composed ophiolitic allochthonous assemblage. The peculiarity of the main element is the spatial combination of sediments with the typically Boreal (newly found Ordovician and also Carboniferous-Permian) faunas with those, transition to Tethyan (Triassic-Jurassic).

Given short review shows that essential results of ophiolitic association formation needs further investigations. As the objects of primary interest, we suggest the Taigonos-Penzhina one, where the problem of island arcs formation and their splitting can be solved. The Kutin-Ust-Belsky object is a principle one for solution of the problem of Triassic paleoclimatic zoning and determination of amplitudes of lateral terrane displacement.

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