MARS' PLANETARY EVOLUTION AND THE PROBLEMS OF EARTH GEODYNAMICS.
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The problems of Earth geodynamics. Now conceptions about the global geodynamics are by and large reduced to the concept of plate tectonics, which is extrapolated without any limitations into remote past of Earth. But till now essential indications of plate tectonics were not detected on planets of Solar system in spite of all searches. It compels to come to the conclusion, that Earth's plate tectonics represents only temporal episode in planetary evolution. Even for Earth the weighty arguments in favour of plate tectonics are available only for last 200 millions of years. At the same time the problem of validity for extrapolations of plate tectonics into Earth's remote past is very important for many ancient regions (for example, for Ural) as since most of geological structures has more ancient age.

The dissipative processes are irreversible. And it is main objection against extrapolation of plate tectonics into pre-mesozoic times. As is well known there are extensive zones of pre-Mesozoic epochs of tectogenesis on all continents. On the other hand there was unified supercontinent Pangea in the late Paleozoic - early Mesozoic times as it followed from plate tectonics reconstructions. This continent had undergone fragmentation in Mesozoic and Cenozoic times. Not less six large blocks of continental crust were generated. Their subsequent evolution resulted in formation of continents in their modern state. Now there are about 12 large lithospheric plates which include fragments of both the continental crust and the oceanic crust. There are tags as further fragmentation of large continental blocks and their association as collision result.

However global geodynamics in its modern state does not stipulated any natural mechanism for repeated complete reunification of all fragments of a continental crust in a single supercontinent. The probability of their association as a result of stochastic motion sharply decreases with increase of number of colliding blocks. In particular, the probability of random association of all existing nowadays blocks of a continental crust in a single supercontinent practically is equal to zero even if to ignore the tendencies to their increasing fragmentation.

As the only unified supercontinent (Pangea) is reconstructed for late Paleozoic - early Mesozoic, from this it follows that there weren't epochs of continental crust fragmentation in pre-Mesozoic times. If all cycles of formation and the closings of oceans postulated for Hercynian, Caledonian and more early epochs actually would have a place then there would nothing be to fragment in early Mesozoic - instead of the uniform block of a continental crust there would be the chaos of continental fragments in oceanic crust.

If there are common laws of planetary evolution, then they should by and large be tracked in evolution of each of planets. This determines our interest to evolution of planets of Solar system.

The degasification model of planetary evolution. Planets are born, live and die. And the different processes correspond to the different stages of planetary development. The processes of gravitational differentiating of planet's substance have maximally variability during planetary evolution. The gravitational reallocation of substance occures since the moment of planet's derivation - heavier components tend to displace more light components. In the long run development of this process determines evolution of planetary degassing processes. Volcanic and magmatic activities can be considered as the forms of planetary degassing processes. Therefore planetary evolution may be tracked in development of eruptive processes on the planet's surface. Now Mars is one of the most investigated planets. The analysis of evolutions of its eruptive activity lead to following scheme of Mars' planetary evolution.

The scheme of planetary evolution for Mars. In own evolution Mars sequentially had passed through four stages.

1. The ancient epoch of global degassing, which preceded intensive meteoritic bombardment. The global planetary degassing was accompanied by volcanic activity, which took place everywhere. Global planetary mud-pyroclastic cover of layered deposits was formed during this epoch. Its relics were partly kept in ancient heavy cratered areas.

2. The epoch of areal degassing. This epoch correspond to localization of degassing processes within large planetary areas (Elysium and Tharsis protocontinents) with the escalating of mud-pyroclasts capacity within this areas. Probably there were extensive eruptions of magmas of andesitic composition at the final stages of this epoch.

3. The epoch of hot spot degassing. The formation of four largest volcanos of the Solar system is the result of the further localization of degassing processes.

4. The modern epoch of almost complete absence of degassing processes has completed endogenic development of Mars

The scheme of planetary evolution for Earth. It is naturally to consider that Mars having smaller mass in comparison with Earth had smaller potential for development of degasification and magmatectonic processes. It was occasion firstly for comparative brevity of Mars evolution (active endogenic processes finished hundreds of millions years back) and secondly for evolutionary cycle more truncated in comparison with Earth.

It is possible to assume, that the following stages of development are probable for Earth with its larger degasification potential and with continued endogenic processes :

1. Epoch of panplanetary degasification and universal magmatectonic activity which was resulted in the formation of protoplanetary (protooceanic) crust.

2. Epoch of localization of degasification and magmatectonic processes within large planetary areas. It was resulted in the creation of protocontinent (or protocontinents) and most ancient platforms of Earth.

3. Epoch of localization of degasification and magmatectonic processes within lengthy girdles of boosted endogenic activity (plastic plate tectonics).

4. Epoch of mainly linear localization of degasification and magmatectonic activity which was resulted in cracking Earth protocontinents and creation of spreading and subducting structures on its surface (hard plate tectonics).

5. Epoch of mainly hot spot degassing.

6. The epoch of complete termination of gravitational-differentiational processes in depths of the planet, and appropriate termination of manifestations of magmatectonic processes on its surface.

Now Earth is on 4-th of set forth above stages of development. The further analysis both the evolutions of other planets and Earth geodynamic structures will show as far as these working schemes are right.