

**MARS: MOVEMENT OF GEOGRAPHICAL POLES AND DEFORMATION OF ITS SURFACE.** A.V. Dolitsky<sup>1</sup>, J. F. Rodionova<sup>2</sup>, R. M. Kochetkov<sup>3</sup>, A. F. Ainetdinova<sup>2</sup>

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A hypothesis about the movement of geographical poles of the Earth were discussed in [1, 2]. The global analysis of the Earth linear structure elements has allowed to define the position of geographical poles in the different geochronological periods [3, 4]. It is known that there are some regions in the equatorial band of Mars looks like the permanent polar caps. For example such layered deposits are in the region 4° south latitude and 156° west latitude. [5].

In this paper trajectories of seeming movement of geographical poles of Mars (at constant position of its geographical axis) are established. It is the curves that unite sequences of geographical poles - poles of symmetry of faults in the global stress field fixed by faults on a surface of the mantle during its rotation around of the core. Positions of poles on spirals of trajectories testify to discontinuous rotation of the mantle. For discovering these poles were made a databank of faults of Mars and were analyzed them positions. A databank of faults of Mars was done on the base of Tectonical Map of Mars [6] by Dr. J.F.Rodionova (SAI of MSU) and A.F.Ainetdinova (student of MSU); the computer program was made by Dr. A.V.Dolitsky (UIPhE RAS) and Dr. R.M.Kochetkov (MTUI), by latter was done the analysis of the data. Trajectories of movement of north and south geographical poles are consisted of four spirals having amplitudes 110°, 100°, 80° and 70°. Trajectories are symmetric to a recent geographical axis and are in ranges of latitudes +/-15-50°. Many separate poles are found in higher latitudes. To discover the age of sequences of these poles and their correlation with the recent geographical poles the computer program will be broadened. But

already now it is possible to assert, that the movement of poles of Mars and magnetic field are the effect of the rotation its mantle over the core. At present time the rotation of mantle have terminated. The certificate of it is a distinction between position of spirals of movements of poles of the past and recent poles which serve for them as poles of symmetry

J.F.Rodionova and A.F.Ainetdinova, using A.V.Dolitsky's method, have established 18 structures, that are directed to equator correlated to the time of their formation. It has allowed to define relative age of structures according to the position of geographical poles. They were found as the points of crossing of bisectors of corners of structures(U-shaped) with spirals of trajectories. All structures of detected age do not contradict a principle “Young structures bridge over ancient structures”. Orientation of structures(U-shaped) direct to equator testify that their formation is under the action of centrifugal forces of rotation of a planet. The influence of these forces is depend upon their sizes, latitude position and amplitudes of raising of the surface of planet in that region. The sizes of structures(Ushaped) and amplitudes of their raising is also depended on power of centrifugal forces. The raising begins with warming up of the planet's crust by magma, penetrated in it through faults, but not extending on this surface of planet.

**Conclusions.** In the history of Mars there are three stage of its development: 1) the stage of formation of planet; 2) a stage of its warming up followed by (a) rotation the mantle over the core, (b) generation a magnetic field of planet, (c) regional structure(U-shaped)-building under action of centrifugal forces of rotation of a planet, 3) a stage of cooling of planet and

termination of rotation of the mantle over the core; at this stage the magnetic field disappears.

Dd - the fourth spiral), last figure - a serial number of a geographical pole on a spiral of a trajectory.

### Table

#### Geographical poles and regional structures (U-shaped) of the same time

Geograf.poles			Structures		
Index	Long.	Lat.	Index	Long.	Lat
1_0	60 w.,	10 n.	1_0	37 w.,	7 s.
1_1	59 w.,	11 n.	1_1	73 w.,	20 n.
1_2	68 w.,	10 n.	1_2	68 w.,	27 s.
1_0	240 w.,	10 s.	2_0	320 w.,	45 s.
2_6	258 w.,	35 s.	2_6	258 w.,	43 s.
2_3	235 w.,	10 s.	2_3	235 w.,	36 s.
1_0	170 w.,	13 n.	1b0	124 w.,	18 n.
1_3	166 w.,	01 n.	1b3	166 w.,	42 n.
1_6	198 w.,	47 n.	1b6	198 w.,	23 n.
2_6	40 w.,	52 s.	2b6	45 w.,	42 s.
1_0	272 w.,	23 n.	1c0	276 w.,	04 n.
1_3	272 w.,	15 n.	1c3	287 w.,	08 s.
2_0	92 w.,	23 s.	2c0	108 w.,	09 s.
2_1	88 w.,	22 s.	2c1	60 w.,	15 s.
2_3	97 w.,	17 s.	2c3	57 w.,	25 s.
1D0	347 w.,	11 n.	1d0	12 w.,	18 s.
1D3	354 w.,	03 n.	1d3	16 w.,	08 s.
1D2	357 w.,	13 n.	1d2	29 w.,	17 n.

#### Indexes of geographical poles and structures (U-shaped) of the same time

The first figure (1 - North Pole, 2 - South Pole), the letter, header at a designation of a pole and lower case at a designation of the structure connected to it (\_\_\_ - the first spiral, Bb - the second spiral, Cc - the third spiral,

### References:

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