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Mars: destruction of the tropical belt and building up extra tropics is a physical requirement of angular momentum equilibration between zones with different distances to the rotation axis.

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Often observed a sensible difference in appearance and structure between tropical and extra-tropical zones of various heavenly bodies including rocky and gas planets, satellites and Sun (Fig. 6) compels to look for a common reason of such phenomenon [1-3]. All bodies rotate and their spherical shape makes zones at different latitudes to have differing angular momenta as a distance to the rotation axis diminishes gradually from the equator to the poles (Fig. 1) (this is felt particularly when one launches rockets into space –preferable cheaper launches are from the equatorial regions – Kourou in the French Guyana is better than Baikonur in Kazakhstan). One of remarkable changes occurs at tropics. As a total rotating planetary body tends to have angular momenta of its tectonic blocks equilibrated it starts mechanisms leveling this basic physical property. At tropical zones (bulged also due to the rotation ellipsoid) the outer shell – crust as a consequence tends to be destroyed, sunk, subsided and shrunk; a density of crust material changes; the atmosphere reacts changing chemistry and structure; in terrestrial anthroposphere man looses its mass and stature (well known pygmioidness process). Extra-tropical belts, on the contrary, tend to add material and increase radius. Thus, a body tends to be like a cucumber but mighty gravity always makes it globular. According to the Le Chatelier rule mechanisms with opposing tendencies also begin to act. However, traces of this cosmic "struggle" very often are seen on surfaces of heavenly bodies as structurally distinguished tropical and extra-tropical zones (Fig. 1, 6) [1-3].

At Mars the widespread "enigmatic" chaotic and fretted terrains at the highland-lowland boundary could be considered as traces of the crust destruction along the wide tropical belt (Fig. 2-4). A system of hillocks and their relics, mesas, ridges, cliffs and separating them depressions or plains (deep up to 1-2 km) is controlled by a crosscutting tectonics or makes a complicated mix (Fig. 3, 4). Prevailing subsidence here is characteristic. The depressions were used and additionally sculptured by moving ices and flowing waters in the past of martian geologic history. On the contrary, wide extra-tropical belts of pedestal craters with broad effusions of fluid-rich material (Fig. 5) obviously help to mend defective momentum.

A comparison with Earth is to the point. There also the wide planetary long tropical zone is marked by destruction of the crust. It is demonstrated by development of numerous islands of the Malay Archipelago (the Sunda Isls., Maluku Isls., Philippines) between the Southeastern Asia and Australia. In Africa and South America huge depressions of the Congo and Amazon Rivers develop where the Archean crust is subsided to depths of more than 2 km. In the Pacific along the equator numerous islands of Micronesia occur (massive corals mark subsiding basaltic summits). Subsidence of the basaltic oceanic crust is followed by an intensive folding and faulting of basalt and sedimentary layers as a larger mass must be held by a smaller space (a planetary radius is diminishing). The central Atlantic is very demonstrative in this sense suffering huge transform fault zones being replaced by more quite tectonics to the north and south where basaltic effusions (plateau-basalts) form large provinces. This addition of dense basalts to the upper crust level helps to increase angular momentum of the extra-tropical blocks.

Recent results from the DAWN mission show that the mini-planet Vesta also has the same structurally deformed equatorial belt. But at Vesta the equatorial belt is subsided and faulted (broken by tight series of parallel grabens) having been squeezed into smaller space because of diminishing planetary radius (Fig. 6)

Thus, Mars, as other planetary bodies, suffers a fundamental re-building of its wide topical zone (supertectonics) as a necessary natural response to the angular momentum adjustment (equilibration) of its different latitude belts (tropics and extra-tropics). This re-building started at the very earlier stages of its geologic history and, certainly, influenced other planetary wide processes.

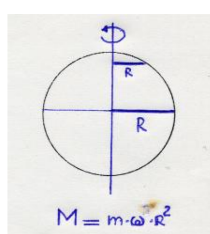

Fig. 1. Differing angular momenta (M) of the equatorial and extra-equatorial zones of a rotating globular body.

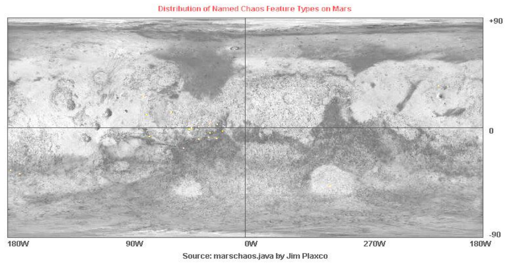

Fig. 2. A map of distribution of chaos features on Mars (yellow points). Source: marschaos.java by Jim Plaxco

Fig. 3. Mars. Mangala chaos
Source: Astrobob.areavoices.com

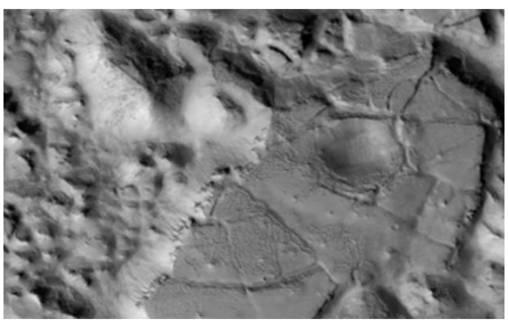

Fig.. 4. Mars. Gorgonum in Phaethontis chaos.
By MRO's HIRISE. Image is 4 km wide

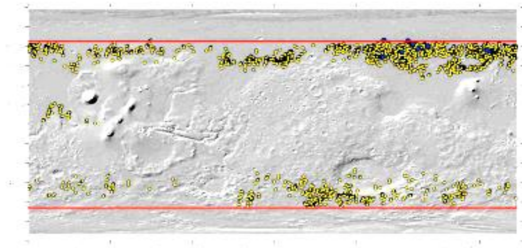

Fig. 5. Mars: extra-tropical belts of pedestal craters with broad effusions of fluid-rich material [4]
Red lines - 60˚ parallels.

Fig. 6. Vesta, Equatorial belt deformation
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