

GLOBAL FEATURES OF CRATERS' DISTRIBUTION ON THE MOON, MARS AND MERCURY

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The complex quantitative analysis of features of craters' distribution on the Moon, Mars and Mercury was performed. The following sequence of treatment of the information, available on the pictures and maps, was used:

- visual analysis of information;
- determination of craters' coordinates and dimensions;
- data input into computer;
- formation of the bank of data;
- compiling and printing of catalogues;
- automatic drawing of the maps of craters' distribution density and diagrams.

Such a method of treatment of information makes it possible to solve two problems: 1- to investigate the phenomenon studied, 2- to give to specialists idea of new data and systematic materials.

The analysis of 37 maps of the craters' density distribution of different diameters and more than 100 diagrams (1,2) allow to make the following conclusions:

- the craters are distributed not uniformly;
- with increasing of craters' sizes the region of their extension sharply reduces and submeridional bands of higher craters' density appear;
- craters of different diameters have their centers of concentration;
- southern hemisphere covered with much more craters than northern one;
- the craters' density (with diameters more 5 km) on the Moon and Mercury decreases from the poles to the equator;
- density of martian craters increases from the north pole to the south one (diameter more than 20 km). Craters with diameters 5-20 km have peaks in the region of Valles Marineris;
- in contrast to the Moon, on Mars craters density in the dark regions exceeds on the average the density in light regions by the order of magnitude;
- the planes of desymmetry and symmetry in craters' distribution were determined.

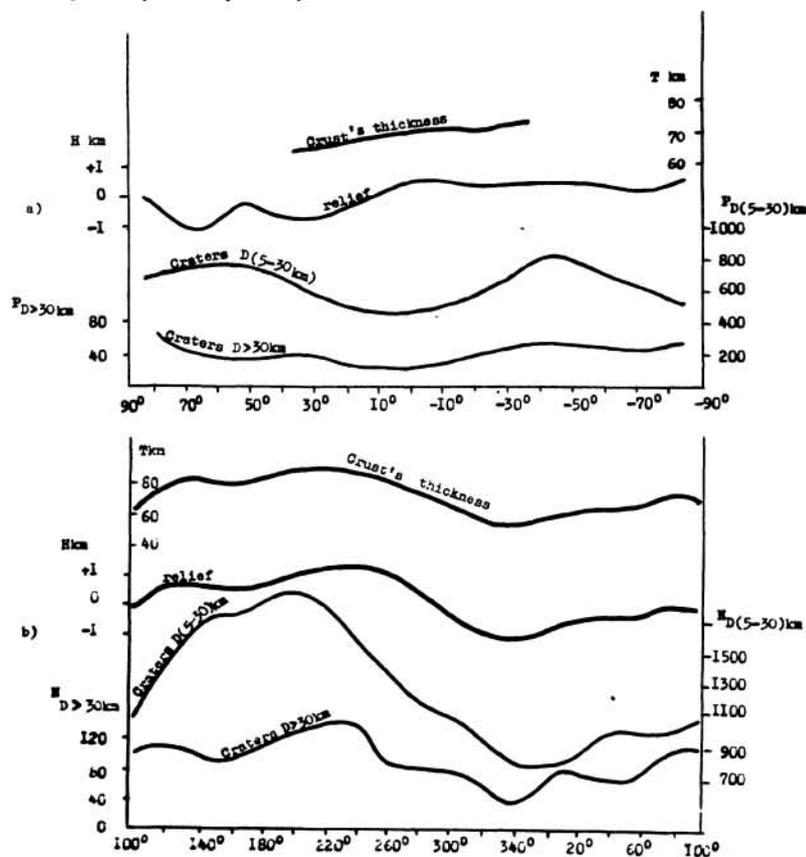


Fig. 1. Craters' distribution for different diameters (P,N), crust's thickness (T) and relief's heights (H) on the Moon: a) along latitudinal bands; b) along longitudinal bands.

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The investigation of some features of distribution of crust's thickness and heights of relief showed that found by us hemispheres differ widely not only in the craters' density but also in the crust's thickness and hypsometric features. The boundary between these two hemispheres on Mars is along the big circle, which is incline at the angle of 45° with the equator. On the Moon, the plane divided the marine hemisphere and continental one is at the angle of 75° with equator.

Figs. 1,2 show the craters' distribution for different diameters, crust's thickness and relief's heights on Mars and the Moon as a function of latitudes and longitudes.

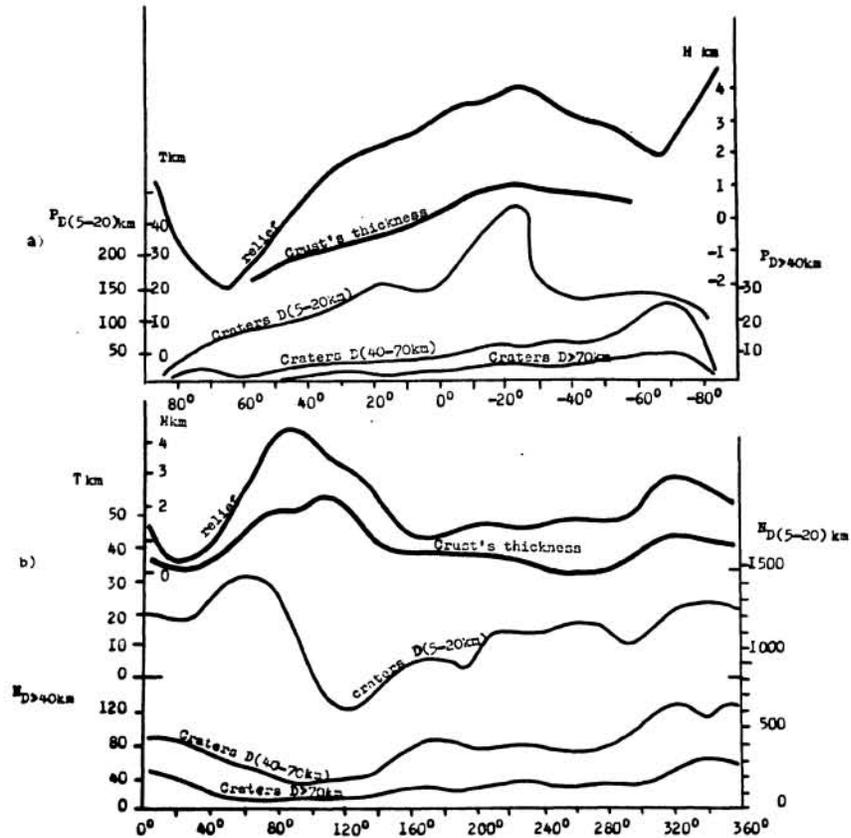


Fig. 2. Craters' distribution for different diameters (P,N), crust's thickness (T) and relief's heights (H) on Mars: a) along latitudinal bands; b) along longitudinal bands.

References:

- (1) Kazimirov D.A., Rodionova Zh.F., Sitnikov B.D., et al. (1980) Density of craters' distribution on the Moon, Mercury and Mars, p. 1-56.
- (2) Kazimirov D.A., Rodionova Zh.F., Sitnikov B.D., Poroshkova G.A. (1981) Planetary regularities of craters' distribution. Moscow, p. 1-67.