THE PLANET MARS: PRESENTATION OF A GLOBAL MAP

Heinz - Peter Jöns, Technische Universität Clausthal, Geol. Inst. Leibnizstr. 10, 3392 Clausthal - Zellerfeld, F.R. Germany

A global map of Mars will be presented at a scale of 1:20 Mill. with the projection of Hammer's equal area planisphere. Four main sets of morphologic units have been outlined on this map - beside the most prominent impact structures Argyre, Isidis, and Hellas which form units of its own:

1) The ancient martian uplands (predominantly southern hemisphere),
2) the updomings of Tharsis, Noctis Labyrinthus, Valles Marineris (= TaNoVa) and Elysium,
3) the lowlands of Mars (predominantly northern hemisphere), and
4) the polar caps.

The main purpose of this map is to demonstrate the relief genesis, the relief dynamics, and (as a result of both) the now existing relief division. It is obvious that the bulk of activities which reshaped the planets primitiverelief has happened in the area of the TaNoVa- and the Elysium updomings and along their margins. Large - scale depressions which occupy the centre of the TaNoVa-updoming have been interpreted as a result of melting of permafrost and/or ground ice which led to the origin of giant progressive chaotic terrains. During their activity these features delivered their mobilized material (mud, aqueous slurry, debris, water) into the already existing circumpolar depression of the northern hemisphere of Mars.
A reactivation (or simply continuation?) of the Tharsis (and Elysium?) volcanism resulted in a large-scale flooding of the adjacent permafrost-related depressions with younger lavas. But remnants of these depressions have been preserved along the border of the Tharsis-updoming (arcuate escarpments and a set of special features northwest of Olympus Mons). Smaller (catastrophic?) outflow events happened into the Chryse Planitia, within Isidus Planitia, probably into Hellas Planitia, and in the vicinity of the South Pole and into Argyre Planitia.

The general border of the TaNoVa-updoming south of the equator is indicated by a set of special features (wrinkle ridges, compressional zones, rows of flatirons, a cuesta landscape, and very old unclassified relatively small volcanoes) which are arranged concentrically or radially with respect to Syria Planum, the most elevated area of the TaNoVa-updoming. That set of features— together with the much younger giant shield volcanoes and the large linear tectonic features to which they are related—offers the possibility to identify areas of nappe tectonics (mainly with concentrically arranged features) as well as (fossil?) embryonic plate boundaries (mainly with radially arranged features).

This global map will show for the first time the dynamic events and their results described above together with many other important features of the planet's entire surface.