TWO PROBABLE HOT SPOT PATHS ON VENUS. A.L.Sukhanov. Geological Institute, USSR Academy of Science, Moscow, Zh-I7.

According to the spreading model of ridge belts (I) "continental" blocks with tesserae, coronae and shear zones (now more ore less under lava cover) were formerly united in a single polar massif: Metis and Atalanta blocks were merged and polar plains absent. Later this massif was slided apart by the wedge of younger crust with ridge belts on I50-250°E, forming global symmetrical pattern.

The structural similarity of western and eastern "continental" blocks was confirmed in the course of general mapping (2). Metis and Atalanta regions are also connected with the chain of structures wich can be interpreted as traces of hot spot (fig.I). The present position of this hot spot is marked by Maslenitsa corona (A) and its older traces by pairs of structures from B-B to F-F. The pairs are not exact matches, but the same is in case of terrestrial hot spot paths orthogonal to mid-oceanic ridges.

Three calderas on Lakshmi Planum may also be the traces of one hot spot: Sacajawea seems to be the oldest one due to its "degraded" appearence, Colette - the middle one, and unnamed NW caldera at the Akna-Freyja junction (3) must be the youngest as its deposits cover Akna dislocations and the letter partly deform the Colette deposits. If so, the Lakshmi plate is not the stable "locus of convergence"(4) or the area of "central spreading"(5), but it moved at least twice above hot spot - first to the east and second to the south.

Such interpretation can explain the apparent differences in age and tectonic styles of Lakshmi surroundings: narrow subparallel ridges and furrows in Akna and augen blocks in Freyja that cross Akna structures and therefore are younger. Akna (folds and thrusts?) must have been formed first due to pressure from the west while hot spot shifted from Sacajawea to Colette, and Freyja (megaboudinage above the polar plain subduction?) formed second while hot spot shifted to NW caldera.

Both interpretation are tentative ones but they are in accordance. The eastern and western members of the ridge belts fan seem to be the oldest ones and they are not traced into polar plains breaking at 60-70°N, so the spreading of this first stage was limited by this latitude and should be followed by the movement of Metis-Lakshmy block to the east and its compression (fig.2). On the second stage the wedge of spreading entered the polar area and Lakshmy plate must have moved to the south.

The origin of Maxwell Montes (composite multiaged folds and faults in the zone of obduction?) remains unexplained in this model. The active pressure of Tessera Fortuna (6) seems to be unlikely, as the center of tessera is brocken by extensional features (Lasdona graben and others) with signs of eastward (i.e. reverse) movements of material. Maxwell massif could emerge as a result of regional concentration of material in the zone antipodal to the fan of belts, or due to SW-NE compression compensating extension in Beta region.

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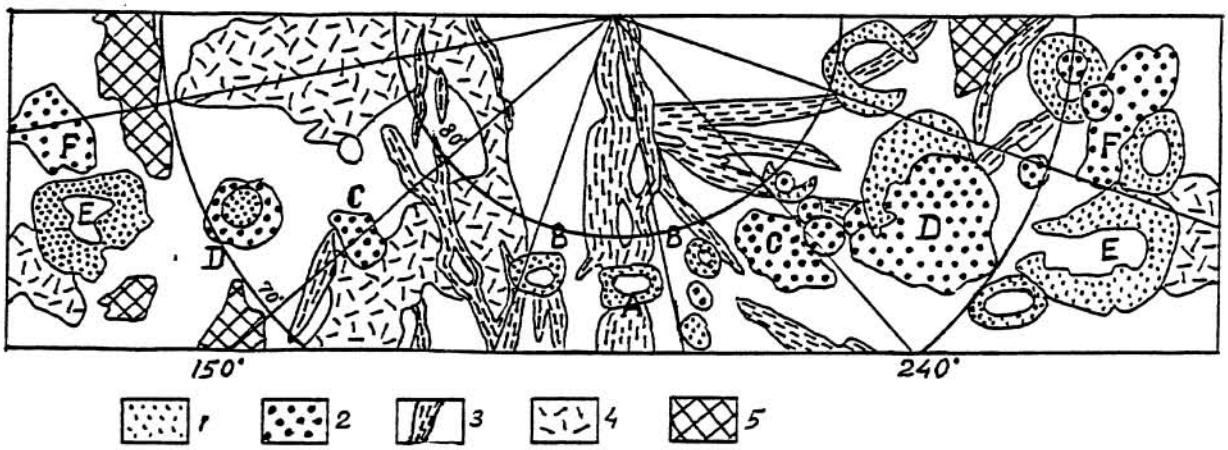

Fig.I. Chain of volcano-tectonic constructions symmetrical to the central corona A. I - coronae, 2 -volcanoes, 3 -ridge belts, 4 - striped plains, 5 - tesserae

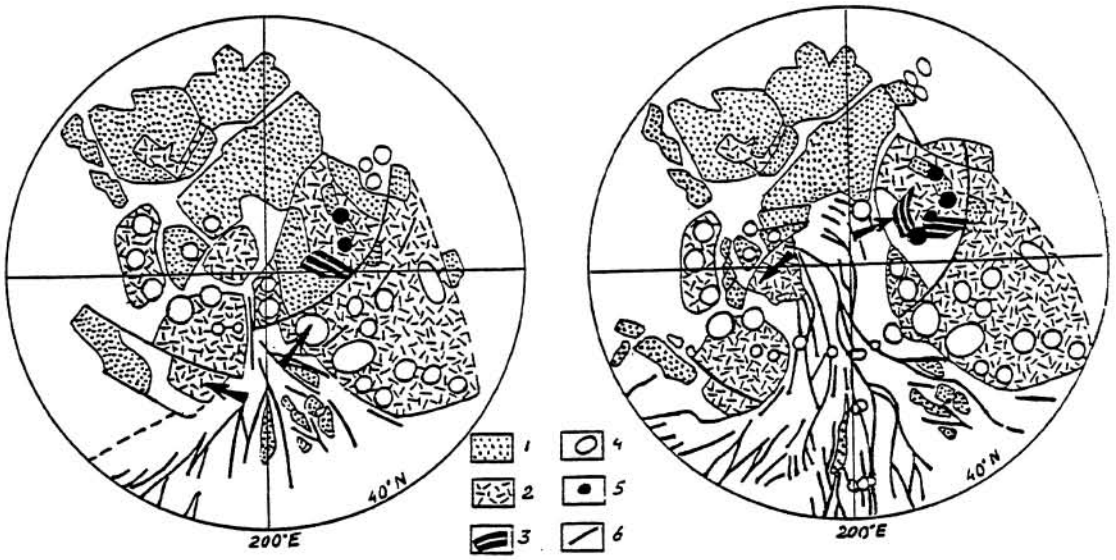

Fig.2. Two stages of ridge belt formation (see text). I -tesserae, 2 - blocks with coronae and complex deformations, 3 -Akna and Freyja, 4 -coronae and large volcanoes, 5 -calderas on Lakshmi Planum, 6 -ridge belts and faults.

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