PARQUET ON VENUS: AREAS OF REGIONAL DEFORMATIONS.

A.L.Sukhanov. Geological Institute, Academy of Sciences of the USSR

Areas of regional deformations called parquet because of their peculiar patterns of criss-crossing ridges and furrows occupy on Venus $\sim 9 \times 10^6 km^2$ and can be traced in places under lava cover; their total area can be $16 \times 10^6 km^2$.

The patterns of parquet change gradually from one area to another one, making a sequence from irregular chaiotic terrain to the regular structures of uniform orientations. I. Areas with small elevation gradient show irregular intricate curved ridges and furrows with vague terminations (47-57°N, 125-143°E); some remnants of circular features (50-150 km) are seen here. This parquet can be called stagnant one. 2. On the gentle-sloping dome of Tellus regio the structures make NW-NE grid-pattern in the central flattened part of the dome, but with the increasing slopes at the edges they change into V-shaped or loop-wise structures oriented radially to the summit, some large blocks seem to slide down the slope of about 1,5:1000. In places large-scale flow-like structures can be seen. 3. SE part of Ishtar terra with average slope $\sim$2:1000 to SE shows definite signs of general movement of material downslope. The area is composed of several stripes devided by long narrow valleys, the material of each stripe resembling glacier tongues with extentional fissures pattern at the upper rear parts of tongues and compressional features at their heads, the latter moving upon ajacent dislocation belt. The thickness of tongues is $\sim$1 km. 4. Tethus regio is the most impressive example of mobilized material. Here series of fissured tongues (50-100 km wide, 200-400 km long) are displaced in "en echelon" manner spreading from the dome in NW part of the region. At least three generations of landslide-like features descend from the dome along the slope $\sim$(1-2):1000. The rear part of the system is 1300-long rift-like zone filled with lavas, the frontal parts overlap the surrounding terrain that seems to subside under the weight of flows (the thickness of flow tongues is 500-1500 m). The displacement of material can be up to 40-180 km. 5. Area east of Maxwell mountains is made of several blocks, each block showing movement of material down the slope, the rear parts of blocks are marked by large grabens with lavas and frontal parts either overthrusted or are in collision with next blocks. 6. There are also examples of parquetized medium-size blocks behaving like single landslides and small-scale plastic flowing of material into local depressions.

The process of parquet formation seems to cover rather large span of time: usually it is mantled with lavas, but in places it was formed simultaneously with linear dislocation belts on lava plains and sometimes cuts the belts. At the eastern part of Ishtar terra lavas cover part of the parquet and in their turn are corrugated by continuing movements. According to crater counts the surface of parquet is older than the surface of latest lavas but definitely younger than lava basement though the parquet seems to be made of the same old material as that ba-

PARQUET ON VENUS
A.L.Sukhanov

sement, representing structural uplifts of pre-lava bed. We see here the result of some resurfacing process, and all ancient structures have been obliterated.

The uniform distribution of dislocations over vast areas shows that stresses were applied to the whole area, not to narrow zones. The spacing of dislocations (5-10 km) suggests little thickness of deformed layer - about several kilometers. The uplifted position of parquet can be considered as the evidence of some active processes at the depth, and the transitions to glacier-like and flow-like structures on relatively steep slopes is an indication of material mobility.

It seems that parquet structures have been created by a general heating of the crust, fascilitated by the high temperature on the surface, probable above ascending asthenospheric currents. The most heated softened and partially melted material was mobilized and moved under gravity force down slopes of about 0,05-0,1° corrugating and fracturing on the way. According to preliminary estimation the velocity of movement and reology of material are comparable with such of glaciers.

Each parquet area behaves as a single microcontinent upwelled above the mantle plume, linear belts of dislocations bordering them or being squeezed between them. The extention in most uplifted parts gave way to lavas. The volcano-tectonic constructions like Beta and Ulfrun are another manifestation of such upwelling processes; at the Bell dome we see some remnants of parquet at the base capped with massive volcanic accumulations.

It seems that instead of global rift zones of the Earth we have on Venus a number of giant hot-spots not connected by faults into the global system because of the very thin lithosphere at the time of parquet formation. And so, Venus tectonics corresponds more closely to the early tectonics of the Earth than to the present plate-tectonics. If the name is needed it may be rather called plume-tectonics.