VOLCANIC PLAINS AND SMALL EDIFICES. J.E. Guest[1], J.W. Head[2], M.H. Bulmer[1] and C.R. Wiles[1], [1]University of London Observatory, University College London, London, NW7 2QS, UK. [2]Dept. of Geological Sciences, Brown University, Providence, RI 02912.

Pioneer Venus, Venera 15/16 and Arecibo data show that the majority of the surface of Venus consists of low-lying plains of volcanic origin. Extensive lava flow fields were identified from these data, as well as clusters of small volcanic edifices (1, 2, 3).

Magellan data returned so far confirm this interpretation and show a complex volcanic history with a variety of volcanic landforms indicative of different styles of volcanism. Styles of volcanism represented include: extensive lava flow fields, some of which extend for hundreds of kilometres and are interpreted to have been erupted at high effusion rates; lava shields of up to some 10 km across produced by relatively low effusion rate eruptions of material of similar rheology to basalt; shields produced by extremely fluid lava spreading around a single centre; lava flows of a few kilometres to tens of kilometres long erupted from fissures; domes produced by lava of higher effective viscosity and possibly of more silicic composition than basalt; and mantling deposits that may be tephra surrounding craters of explosive origin.

Although small volcanic edifices are distributed over most of the plains areas, there is a strong tendency for them to occur in clusters covering areas in the order of hundreds of kilometres across. These nodes of volcanic activity tend to be dominated by the products of one particular style of eruption suggesting that each cluster was produced in a relatively short period of time from a magma source that repeatedly produced lavas of similar composition and/or rheology. However, in some areas, volcanic complexes consist of a wide range of types of edifice from those produced by highly fluid lava to those produced by lavas with high effective viscosities. Such complexes may have resulted from long-lived volcanism with the production of more evolved magmas within high level magma reservoirs.

References

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