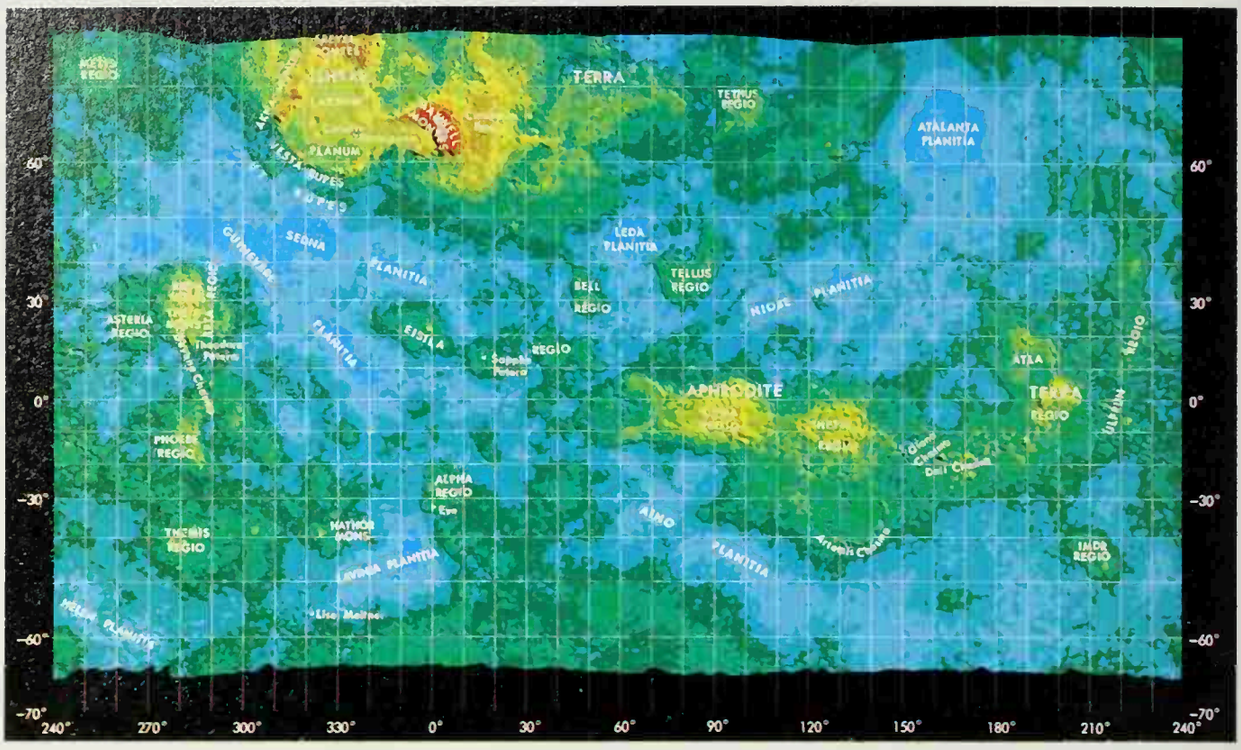

A radar map of the surface of Venus, made by the Orbiter section of the Pioneer Venus spacecraft.

so that any sedimentary rocks would have to be formed from wind-borne deposits. Radar techniques are able to penetrate the dense atmosphere, and studies from Earth (using the large Arecibo telescope) and from the Orbiter section of the Venus Pioneer mission have revealed considerable surface detail. (The Orbiter had low resolution of about 100 km, whereas Earth-based radar can approach 6 km in certain regions.) The main portion of the planet is surprisingly flat, and this has caused speculation that there is little current tectonic activity on Venus relative to that on Earth, and that it is more like Mars in this respect. The lack of water (thought to help to 'lubricate' Earth's plate tectonic movements) and the high temperature which would possibly maintain rocks in a somewhat plastic state (and thus allow them to deform, and any elevations to subside) may be contributory factors. But there are high regions, such as Aphrodite Terra, Beta Regio (Thea Mons and Rhea Mons) and especially Ishtar Terra, where Maxwell Montes rise to 12 km above the mean planetary radius of 6 051·2 km. These must be sustained somehow, and although suggestions have been made that they are relics of earlier tectonic activity and represent the planet's continental regions, it is distinctly possible that they are situated over 'hot spots' in the mantle and that volcanic activity is still occurring. Many of the landforms are similar to terrestrial shield volcanoes, and high-resolution images of Maxwell Montes appear to show a 100 km summit crater and other volcanic features. The other two regions, and especially Beta Regio, show a strong concentration of lightning-like activity. As the atmospheric processes do not appear to be able to generate lightning in a manner similar to that occurring on Earth, this is further evidence of volcanism and the accompanying electrical discharges within the cloud of ejecta.

There are indications of other considerable features, including a couple of graben-like structures, large basins and a considerable number of craters, ranging in size from about 160 km to 35 km in diameter. There are also indications of larger impact structures, including one 1 800 km in diameter, but there appears to be a deficiency of small craters. This is probably due to the presence of a very massive atmosphere which prevents small meteoroids from reaching the surface, as well as perhaps to the thermal effects mentioned earlier. Surface winds are now known to be very light, so that any erosion of

A photograph of the surface of Venus taken by Venera 10. This has been processed to correct the original distorted shape produced by the camera. The horizon line is marked. The flat surfaces in this photograph suggest that erosional forces have been at work.