

It is possible, according to Marov and Petrov, to interpret the data obtained about the magnetic field and upper atmosphere of Mars in terms similar to those used for the earth: shock front, magnetospheric boundary and magnetosphere. The magnetic field strength at the Martian equator is about 60 gamma, or 500 times less than that on the earth.

Ultraviolet photometers aboard the two satellites gave some information about the distribution of gases in the upper atmosphere. At 400 to 500 kilometers from the surface, hydrogen is very rare. There are only about 6,000 hydrogen atoms per cubic centimeter. Atomic oxygen is practically absent above 1,600 kilometers.

Like Mariner 9 the Soviet orbiters found "hotspots" on the surface of Mars, areas where the temperature is 10 to 15 degrees K. higher than in the surrounding areas. The reason for the temperature difference is probably that the surface at these hotspots is made of particles of different size and porosity from the neighboring areas. Or the hotspots may mark locations where rock formations emerge.

There are also temperature differences over larger regions. The dark and bright regions ("seas" and "continents") differed by about 10 degrees both during the dust storm and after it. This probably is due to differences in the amount of sunlight reflected by the different regions. The storm caused a general depression of surface temperatures. At middle latitudes the decline was about 20 to 30 degrees. At latitude 60 degrees south the temperature around midday did not exceed 245 degrees K. After the storm it rose to 270 degrees K.

During the storm photometric measurements of carbon dioxide showed its emissions much weakened. This was probably due to obscuration by the dust. It probably indicates that the tops of the dust clouds were very high, between 8 and 10 kilometers above flat terrain and somewhat less above mountainous terrain. The contrast in brightness between seas and continents was considerably less than in clear weather. The numerical difference led V. Moroz and Z. Ksanfomaliti to conclude that the mean radius of the dust particles (assuming that they are made of silicates) is between one-half and one micron.

In conclusion Marov and Petrov remind the reader that they are summarizing the results of a large number of investigators, whose work continues and from whom further reports may be expected. What has been found so far by the Soviet orbiters and by Mariner 9 whets the appetite for future Mars orbiters and landers. □

June 30, 1973

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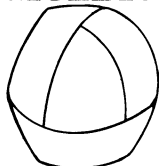
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