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Degree of Smoothness of the Continents and Seas of Mars

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This is a study of changes in "land-sea" contrasts from the center to the edge of images of Mars, obtained through infrared and red light filters, and also of the positions of brightness maxima on the intensity equator for the continents and seas in relation to different values of the phase angle of the planet. Investigation reveals a decrease in contrast toward the edge of the image and a noncoincidence of the positions of the forementioned brightness maxima for the continents and seas of Mars. The author's previous conclusion, namely, that the law of reflection of light is not the same for the averaged continents and seas of Mars, is confirmed.

In previous articles,[1-3] devoted to an investigation of the surface of Mars, we used the so-called smoothness factor q, introduced for a dissected surface by N. N. Sytinskaya.[4] In this connection we made studies of the distribution of brightness along a radius of the image of Mars for the continents and separately, as far as possible, for the seas.

It is well known, however, that this is a difficult problem to solve, since it is necessary to have very accurate information, for example, about the angle of incidence of the light for the point being photographed. In this article we shall consider the same problem, but shall approach it from a different standpoint.

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Study of Variation in the Land-Sea Contrast from the Center to the Edge of an Image of the Planet, Obtained in Red and Infrared Light

We have at our disposal a whole series of negatives of Mars, obtained through red and infrared filters and suitable for studying the land-sea contrast at different distances from the center of the disk. In the process of photometric evaluation these negatives were placed on the stage of an MF-2 microphotometer in such a way that operation of the micrometer displaced a 0.14- × 0.14-in. light window in a direction perpendicular to the land–sea boundary (see, for example, Fig.