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The atmosphere of our planet is an interesting optical system the refractive index of which decreases with altitude due to reduced air density. Thus the earth's atmosphere can be considered as the lens of the huge size of the shape of the Earth and having a monotonously changing refractive index. This circumstance leads to the appearance of a number of optical phenomena in the atmosphere caused by the refraction and the reflection of rays in it. Consider some of the most significant optical phenomena in the atmosphere. Atmospheric refraction is the phenomenon of curvature of light rays when light passes through the atmosphere. With altitude, air density and so the refractive index decreases. Imagine that the atmosphere consists of optically homogeneous horizontal layers, the refractive index of which changes from layer to layer Fig. 299. During the propagation of the light beam in such a system it will be in accordance with the law of refraction to cling to the perpendicular to the boundary layer. But the density of the atmosphere decreases not irregular and continuously which leads to a smooth curvature and rotation of the beam at the angle α with the passage of the atmosphere. As a result of atmospheric refraction we see the moon, the Sun and other stars is somewhat higher where they are actually. For this reason, increasing the length of the day in our latitudes for 10-12 minutes compressed disks of the moon and Sun on the horizon. I wonder what the maximum angle of refraction is 35' for objects near the horizon which exceeds the visible angular size of Sun 32'. From this fact comes at the moment when we see that the lower edge of the luminary touched the horizon line is actually the solar disk is below the horizon Fig. 300. The twinkling of stars is also associated with astronomical refraction of light. It has long been noticed that the flickering is most pronounced for stars near the horizon. The air flows in the atmosphere alter the air density over time which leads to an apparent flickering of the heavenly bodies. Astronauts in orbit any flashing do not watch. In hot desert or steppe regions and in the polar regions of strong heating or cooling of air near the earth's surface leads to the appearance of a Mirage due to the curvature of the rays become visible and appear closely spaced objects which are actually located far beyond the horizon. Sometimes this phenomenon is called terrestrial refraction. Appearance of mirages is explained by the dependence of the refractive index of air on temperature. Distinguish between lower and upper mirages. The lower mirages you see on a hot summer day on a hot asphalt road

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