last 46 years, a greater or leas number of spots have been visible every year. For several days, during the latter part of September, 1846, we could count sixteen of these spots which were distinctly visible, and most of them well defined; but on the 7th of October following, only six small spots were visible, though the same telescope was used, and circumstancse were equally favourable.

Nature of the Solar Spots.—The appearance of the solar spots is that of a dark nucleus surrounded by a border less deeply shaded, called a penumbra. They are both well represented on the map. When seen through a telescope, the sun presents the appearance of a vast globe, wrapped in an ocean of flame, with the pots, likes incombustible islands, floating in the fiery abyss.

Concerning these wonderful spots a variety of opinions have prevailed, and many curious theories have been constructed. Lalande, sa cited by Herschel, suggests that they are the tops of mountains on the sun's surface, laid bare by fluctuations in his luminous atmosphere; and that the penumbræ are the shoaling declivities of the mountains, where the luminous fluid is less deep. Another gendeman, of some astronomical knowledge, suppose that the tops of the solar mountains are exposed by tides in the sun's atmosphere, produced by planetary attraction.

To the theory of Lalande, Dr. Herschels objects that it is contradicted by the sharp termination of both the intornal and external edges of the penumbræ; and advances as a more probable theory, that " they are the dark, or at least comparatively dark, solid body of the sun itself, laid baro to our view by those immense fluctuations in the luminous regions of the atmosphere, to which it appears to be subject." Prof. Olmsted supports this theory by demonstrating that the spots must be "nearly or quite in contact with the body of the sun."

In 1773, Prof. Wilson, of the University of Glusgow, ascertained by a series of observations that the spots wore probably "vast excavations in the luminous matter of the sun;" the nuclei being their bottom, and the umbræ their shelving sides. This conclusion varies but little from that of Dr. Herschel, subsequently arrived at.

Magnitude of the Solar Spots .---The magnitude of the solar spots is as variable as their number. Upon this point the map will give a correct idea; as it is a pretty accuratore prosentation of the sun's disc, as seen by the writer on the 22nd of September. 1846. In1799. Dr. Herschel observed a spot nearly 30,000 miles in breadth: and he further states, that others have been observed whose diameter was upwards of 45,000 miles. Dr. Dick observes that he has several times seen spots which were not less than $\frac{1}{25}$ of the sun's diameter, or 22,192 miles across.

Revolution of the Sun upon his Axis.-The axis of the sun is inclined to the ecliptic $7\frac{1}{2}^{\circ}$, or more accurately 7° 20'. He revolves in the same direction in which the planets revolve around him, and the time occupied in making a complete sidereal revolution is 25 days 10 hours. But when a particular spot has arrived opposite any particular star from which it is started. in the direction of which the earth was 25 days and 10 hours before, the earth is found to have advanced some 24°, or 1,700,000 miles in her orbit; and the sun must actually turn a little more than once round, to appear to make a complete revolution to a beholder on the earth. His synodic revolution consequently requires 27 days, 71 hours, or near 46 hours more time than his sidereal revolution.