

of his life. He fitted up three contiguous houses owned by him, making them his observatory, workshop, engraving and printing office, and library. Hovel was an extraordinary man. He made his own instruments, engraved his own maps, and printed his observations with his own hands. On the 26th of September, 1679, a vicious servant wickedly set Hovel's observatory on fire. Although most of his important works had been already printed and distributed, the loss of his instruments and many papers caused him much grief, and hastened his death. His "Selenography" appeared in 1647. The telescope he used magnified from thirty to forty diameters, and from his observations he engraved a map shewing two hundred and fifty lunar formations. The chief lunar formations he named after the earthly formations he fancied they most resembled. The lunar Alps and Apennines, and four of the lunar promontories, retain the names he gave them; and the term *Mare* used by him to designate the dark lunar plains has since remained in common use. He called these plains seas, he says ("*weil er sie mit nichts anderm besser zu vergleichen wisse*"), because he knew nothing better to liken them to. For more than a century Hovel's map was the best map of the moon.

The first telescopic observers soon found: the lunar hemisphere turned earthward is always the same, or nearly the same. The difference there is, is due to libration, and its maximum amount is not a forty-ninth of the moon's circumference, or more exactly is 7 degrees, 53 minutes of lunar measurement. To that extent only the moon changes the face turned earthward. The rest of her sphere is hidden forever from mortal sight. Hovel was first to explain that libration in longitude is due to the fact, the moon rotates on her axis at a uniform rate, while her movement of translation varies in velocity with her varying distance from the earth. Galileo had already found out that there is a similar libration in latitude, due to the moon's axis of rotation not being exactly perpendicular to the plane of her orbit.

In 1651, J. B. Riccioli, a member of the Society of Jesus, compiled a lunar map noteworthy chiefly from its nomenclature. In lieu of Hovel's names, he designated the craters and places marked on his map after names of eminent mathematicians and astronomers. A French astronomer archly says: "Riccioli shrewdly avoided the