

under side, as in C and D, the ray usually meets the eye after the second reflection; but in consequence of two reflections and two refractions, the violet will form the upper and the red the under part of the spectrum.

The lower bow A B is called the primary bow, and there is no doubt that it is produced by one reflection and two refractions, for by calculating the inclination of the red and violet rays to the incident rays R A, R B, it is found that one is $42^{\circ} 2'$, the other $40^{\circ} 17'$, which gives $1^{\circ} 4'$ as the breadth of the bow, a result which agrees with observation.

It is equally certain that the secondary bow C D is produced by two reflections and three refractions, for by computing the inclination of the red and the violet rays to the incident rays R C, R D, we find it to be $50^{\circ} 58'$ for the red ray, and $54^{\circ} 10'$ for the violet, leaving $3^{\circ} 10'$ as the breadth of the bow. This result agrees with observation, and with the fact that its colours are reversed, the violet forming the upper part of the bow. The secondary bow is frequently seen without the primary, but it is not so vivid, in consequence of the light having suffered two reflections.

Lunar rainbows have been occasionally seen, and are produced by the rays of the moon falling upon drops of rain. Plot, in his history of Oxfordshire, says that he observed one in 1675, but it was without colour; and an appearance of the same character was seen by Mr. Tunstall, in the year 1782. The same gentleman observed another a few months after, which had a singular variety of appearances. It was visible for about five hours, and during this time assumed many peculiarities of form and colour. When it was first seen it was without colour, though the arch was strongly marked; but after a short time it began to assume the appearance of a solar bow, and in about three hours was very brilliant, though less so than the solar. Soon after this the bow failed in the northeastern limit, and the intensity of the colours decreased, until at last they vanished.

Another account of the appearance of a lunar rainbow is given by an anonymous writer, which, however, we must refer to as one of the most interesting and circumstantial accounts with which we are acquainted. "On Sunday evening," he says, "the 17th of August, after two days of rain, attended with thunder and lightning, about nine o'clock, twenty-three hours after full moon, looking through my win-