and broken. A few of the mountains are similar to ours, but are in general more rugged, and on an immensely greater While no craters on the earth scale. exceed seven miles in diameter, some of the lunar ones exceed one hundred miles, and thousands are from ten to twenty These craters are miles in diameter. circular in form, and are surrounded by a ring of mountains generally very high, ranging from 1,000 to 20,000 feet above the general surface; within the crater there is in some cases a deep hollow, and in others it is completely filled in, and in the centre is a group of high peaks, having also small craters at the summit. In many cases there is no elevation at all, but merely a great cavity in the open plain.

These mountains cast long shadows on the bright surface of the moon, and from observing the length of these, the heights of some of them have been computed to be from 25,000 to 30,000 feet. These summits often reflect the light, while the surrounding portions are in total darkness, and thus they present many strange appearances in the different phases. Another peculiar feature is seen in certain long, deep fissures or clefts, called by the Germans furrows or rills, which run in some cases for hundreds of miles, through mountain and plain alike, and also in long streaks of light which, near full moon, extend hundreds of miles, and form a very striking feature in the moon's appearance. The principal instance of the latter is that proceeding from the crater Tycho. Their cause has not yet been satisfactorily explained, but it is thought they are, as it were, cracks, filled with some substance of greater reflecting power than their surroundings.

The whole presents an indescribable chaos of mountains, depressions, and craters, of which no counterpart can be found in the roughest of terrestrial mountain-ranges, in some parts level, and in others honey-combed with cavities and hills, standing very thickly in places, and merging into one another in confused masses, where new ones have encroached upon the older, and partly obliterated them.

The resemblance of these lunar phenomena to volcanic formations on the earth's surface naturally leads us to attribute them to the same cause, but we cannot be certain about this, as no evidences of volcanic

activity can be perceived in the moon and, although it has been daily observed for hundreds of years, no perceptible change $h_{i,j}$ been noticed on its surface; all is apparently in a state of absolute quiescence—ellent as the grave.

A question very much discussed is whether the moon has an atmosphere. No positive evidence of the existence of any has been found, and if there be any, it must be at least hundreds of times rarer than that on the earth. Several lunar phenomena indicate the total absence of atmosphere. In its telescopic appearance we notice the jagged and sharp line between light and darkness, and the abrupt disappearance and re-appearance of stars when occulted by the moon, whereas, if any air were there, the passage from light to darkness would be gradual, as is the case in our twilight, and moreover, no storms, nor clouds, nor any effect of atmospheric pressure can be noticed. Another proof is the absence of refraction. Stars in their occultations should be seen after they really disappear, and before they reappear, from the refraction of their light-rays by the atmosphere, if there were any, but, though great numbers of these occultations have been observed, there is not the slightest sign of their being shortened in this way. Neither is there seen any distortion of the sun's light in a solar eclipse, such as occurs in the transits of Venus. Moreover, the moonlight, when examined with the spectroscope, appears the same as sunlight, with no trace of atmospheric influence.

If the moon were once part of the earth, as is supposed, it must have had an atmosphere, and there are many hypotheses to account for its disappearance. It has been surmised that there may be immense cavities in the moon's mass, caused by volcanic eruptions, and that the air has retired into these; and, again, that the rocks within the moon's surface have, in cooling, absorbed the air, for it is well known that, while a rock, becoming heated, expels all its absorbed gases, when it again cools slowly, it can re-absorb a very great quantity; and, in connection with this, it has been suggested that the interior of the earth which is now supposed to be intensely heated, if it continue to cool will, in time, by absorption, rob the surface of all its atmosphere.

When more careful observation had been