mollusks, such as snails, clams, &c., by having a very large head, a pair of large eyes, and a mouth furnished with a pair of jaws, around which are arranged, in a circle, eight or ten arms furnished with suckers. In the common cuttle-fish or squid of our coast, the body, which is long and narrow, is wrapped in a muscular cloak or mantle, like a bag, fitting tightly to the back, but loose in front. It is closed up to the neck, where it is open like a loosely-fitting over-coat buttoned up to the throat. Attached to its throat, by the middle, is a short tube, open at both ends. The tube or siphon can be moved about in any direction. The animal breathes by means of gills, which are attached to the front of the body, inside the cloak, and look like the ruffles of a shirt-bosom. By means of these gills the air contained in the water is breathed, and they answer the same purpose for the cuttle-fish that our lungs do for us. In order to swim, the animal swells out the cloak in front, so that the water flows in between it and the body. Then it closes the cloak tightly about the neck, so that the only way the water can get out is through the siphon. Then it contracts forcibly its coat, and the water is driven out in a jet from the siphon, and the body is propelled in an opposite direction like a rocket through the water. This siphon is flexible, like a water-hose, and can be bent so as to direct the stream not only foward, but sideways, and backward, so that the animal can move in almost any direction, and turn summersaults with perfect ease; and so rapidly do some cuttle-fishes swim, that they are able to make long leaps out of the water. Usually, however, the animal swims backward, with its long arms trailing behind. Our common cuttle-fish of this coast has, in addition to its eight arms, two long slender tentacles, which may be withdrawn into the body. The tail is pointed, and furnished with a fin on each side. The octopods, to which the Brazilian cuttle-fish belongs, have round purse-like bodies, and eight arms united at the base with a web, and they swim by opening and shutting their arms like an umbrella; in this mode of swimming they resemble the jelly fishes. The paper nautilus is nothing in the world but a female cuttle-fish that builds a shell. There was a very pretty story told of her habits by Aristotle, the old Greek naturalist, which every body believed until quite lately. He said she rode on the top of the waves, seated in her boat-like shell, and spreading her broad arms to the winds for sails. But, unfortunately, the story has no foundation in fact. She either crawls about on the bottom of the sea, or swims quite like other cuttle-fish, shell foremost, only occasionally coming to the surface. Strangely enough, she holds the two broad hand-like extremities of the arms against her body, and it is the inside of these arms that secrete the paper-like shell, which is only a sort of cradle for her eggs. Not so with the pearly nautilus, which is furnished with a beautiful coiled-up pearly shell, formed on the outside of the animal. The shell is divided into numerous chambers, and the animal, living in the outer one, builds a partition across the back part of it as the shell grows. Cuttle-fish are sometimes used for food by the Brazilians, and different species may be seen in the markets, where one frequently finds them still alive. Sometimes as we stoop to examine one, its body is suddenly suffused with a deep pinkish glow. Before we have time to recover our surprise this colour fades, and a beautiful blue takes its place as rapidly as a blush sometimes suffuses a delicate cheek. The blue, perhaps, is succeeded by a green, and then the whole body becomes pink again. One can hardly conceive anything more beautiful than this rapid play of colours, which is produced by the successive distension of sets of little sacs containing fluids of different colours which are situated under the skin. The cuttle-fish is also furnished with a bag containing an inky fluid, which when the animal is attacked or pursued, it ejects into the water, thus completely blinding its adversary and effectually covering its retreat. It is from this fluid that the colour sepia is made. Besides carrying an ink-bottle some species of cuttle-fish are provided with a long, delicate, horny pen, which forms a sort of stiffener to the back. In some species the pen is hard, thick, and broad, and the cuttle-fish bone of commerce is of this kind. The species found in our waters is very small, and not at all dangerous, being barely large enough to draw blood from the hand; but in the tropical seas they are very large, powerful, and dangerous. The cuttle-fish is the original of Victor Hugo's devil-fish, so vividly described in the "Toilers of the Sea." If the devil-fish were a beneficent one, Mr. Hartt says he should be sorry to destroy our faith in it; but as it is, he believes it will be rather a relief than otherwise to know that in some important respects Victor Hugo's story of it is a fable. The Kraken was a mythical cuttle-fish of fabulous size.—*American Naturalist.*

The Moon.

To produce a volcano, water is required. By the slow escape of the central heat of our globe, the interior parts cool and contract. The crust of the earth, left without sufficient support, cracks and subsides. The shock is propagated through the earth, and an earthquake is produced. Often water penetrates, and in the form of steam at high pressure drives up the molten rocks before it, and a volcano is produced. No water can be detected on the surface of the moon; where, then, is the water that produced the volcanoes we see there? Some have suggested that the solid part of the moon is pear-shaped, with the stalk end as it were towards us; whilst the water has all accumulated on the flattened end of the pear, and so is invisible to us. Such a supposition, however, appears extremely gratuitous, and besides is unneccessary. If any of Jupiter's or Saturn's satellites were so constituted, the part furthest from Saturn or Jupiter would be less bright than the rest of their surfaces; but though their surfaces do vary in brightness in different parts, the dimmer part in no case, we believe, is that which is furthest from their primaries. So there is no analogy in favour of this idea. The solution of the difficulty arises from the different bulks of the earth and moon. The weight of bodies on the moon is less than one-sixth of what it would be on the earth. Now, we know that the sun is composed largely of elements such as exist on our globe; nay, further, remote fixed stars are so also. We have thus every reason to believe that the materials of the moon will not differ much from those of the earth. As the interior of the earth cools down and contracts, the weight of the outer crust which, if strong enough, would be left as a shell, breaks it down, and crushes it into the contracted matter below, so that no cavities, or comparatively small ones, are left. But in the moon the shell covering a cavity would be of smaller radius, the moon's radius being less than that of the earth, and consequently stronger. Above all, the weight of the materials composing it being less than a sixth of the weight of the materials of the earth's crust, but as strong, owing to the feebler force to crush the crust down, cavities would be formed on a far larger scale than could exist in the earth. Imagine, then, the earth and moon at equal temperatures. They cool down—the moon, however, being the smaller, the more rapidly. The thin crusts at first formed on each are crushed down on the central mass as it contracts. After a while, when the crusts have acquired some thickness, the lunar crust becomes thick enough to withstand the crushing for awhile, and cavities are formed. When the break-up takes place at last, the lunar oceans penetrate, and pouring in immense quantity into the large cavities, meet the still hot mass below, and a tremendous volcanic outburst is the result. When we remember that the power of the pent-up steam would be as great as on the earth, but the rocks and lava to be thrown up would weigh less than one-sixth, we can easily understand the vast craters which exist on the moon, so thickly in places as to suggest the idea of the surface having been blown up in bubbles. As the cooling process continues, other and larger cavities are formed, the weight of the superincumbent crust being too little to crush it down into them. Into these ultimately the oceans descend, and after them the atmosphere. We thus see how, by the cooling down of the moon, vast internal cavities have been formed, in which her ocean and atmosphere are now buried. The atmosphere that still clings to the moon is but the thin upper layer; the rest has long since disappeared. The rates of cooling down of the earth and moon are inversely proportional to their diameters, or as three to eleven. The disproportion between these is nothing so great as that between the times of their stopping each other's rotations. We can thus see why it is that, whilst ages ago, the moon has ceased to rotate independently of us, she still continues to show some signs of central heat in the few cases of volcanic outbursts that have been observed.—*Chambers' Journal.*

The Rosse Telescope Set to New Work.

Lord Rosse has even been able to form an estimate of the relative amount of heat we receive from the moon and from the sun. He states, as the result of his observations, that the radiation from the moon is about the 900,000th part of that from the sun. But perhaps the most interesting result of the inquiry is the determination of the actual heat of the moon's surface at the time of full moon, or rather at lunar mid-day. By comparing the heat received from the moon with that derived from certain terrestrial sources of heat, Lord Rosse finds that the moon's surface must be heated to a temperature of about 500° Fahrenheit, or nearly 300° above the boiling point! Nor is this result, startling as it seems at first sight, to be greatly wondered at, when we remember the circumstances under which the moon's surface is exposed to the solar rays. Fancy a day a fortnight long; not as in our polar regions, with a sun only a few degrees above the