

flecking one spot in the heavens, and the earth may be altogether lost in surrounding darkness. Yes; this busy world, full of light and life and energy, this world which we count so large, is, to millions of distant suns and worlds, far too small and too dim in her shining to be seen at all by anything approaching to human vision.

You need not imagine that *all* the bright bodies shining over our heads by night, most of which appear so small to us, are larger than our earth. Some are greater, some are less; some are more bright, some are more dim; some are heavier; some are lighter; for there is infinite variety in the universe. We can no more find two worlds or two stars exactly alike in the sky, than we can find two leaves, or two blades of grass, exactly alike on earth.

Take the two heavenly bodies which are most familiar to us—the moon and the sun. As we commonly see them, they appear to be much the same in size; only the moon is pale and clearly defined, while the sun is dazzlingly brilliant, and surrounded by a fringe of radiant light. Nobody would imagine, from mere guesswork, that the one is enormously larger than the other, and for ages nobody ever did imagine it. In fact, it was quite impossible that men should, so long as they counted the sun and the moon to be at about the same distance from the earth.

Now we know how things are; not by guess-work, but by actual measurement. Now we know that the size of the sun, compared with the size of the moon, is, roughly, much the same as the size of a small house compared with that of a cricket-ball. We know that the sun and moon occupy to our vision the same amount of space in the sky, only because the sun, although enormously larger, is also enormously more distant; and the greater distance reduces the apparent size—not, of course, the real size.

We know these facts, as already stated, by actual measurement. The size of the sun, the size of the moon, and their distances from earth, have all been again and again calculated. No plumb-line has been dropped upon the sun from earth, no tape has been carried to the moon. Such modes are not needful. The height of a church steeple can be measured from the ground, without any need to climb it. The altitude of a mountain may be discovered from its base. In many cases the distances and

sizes of heavenly bodies may be measured, more or less accurately, from earth, by means of the right instruments and of careful observation. In many cases; by no means in all; because countless stars and worlds are too far distant. But the sun, the moon, and all the planets, lie within reach of such operations.

We have seen that the earth is about 8,000 miles in diameter, with a circumference at the equator of about 25,000 miles. The moon is much smaller, having a diameter of only 2,000 miles, and a circumference of about 6,000 miles. But the sun, measured straight through the centre from side to side, is 865,000 miles, while his circumference is over 2,500,000 miles.

If the sun were as near as the moon he would be a fearful object; not alone because of his enormous size, but because of the raging ocean of fiery gases which covers his whole surface; because of the whirling storms, the awful heat, the scorching glare. Though, indeed, we ourselves would see little of all this; for long before the sun could approach to the position of the moon, our little earth must have fallen into his fierce embrace, to be speedily transformed into a part of the sun's gaseous envelope. If by any possibility the sun *could* be where the moon is now, and our earth *could* still occupy her present position, then great tongues of fiery hydrogen gas might at any moment leap out from the sun's surface, and enfold the whole world from north to south, from east to west. So, thankful as we ought to be for the sun's heat and light, we may also be thankful that he is very far away.

The moon's distance from us is only about 240,000 miles; a mere nothing compared with the generality of astronomical distances. Powerful telescopes lessen greatly the dividing space, bringing our silvery friend, as it were, to a position only about 500 miles off; some say even as near as 250 miles.

To be sure, one cannot see very much of a place that is 250 miles off. A town on earth is only visible at such a distance, if visible at all, from the top of a high mountain, because otherwise it must be hidden by the bulging surface of the ground. London itself, 250 miles away, would appear as a mere faint spot, and New York would be fainter still. A mountain or a large lake might be more distinctly seen.

On the moon we can detect wide plains and great mountain ranges, and