

what seem to be huge craters of extinct volcanoes, but no lakes. To the best of our knowledge, no water is to be found on the moon; at all events, no water in either the liquid or the vaporous form. The fair world, to us so beautiful in her silvery whiteness, appears to be a world of lifelessness; without air, without water, without fire, without plants or trees, animals or men—not a globe of fierce light and furious heat, like the sun, but a dead ball rolling through the sky; bright only when lighted by the sun's brightness.

One might quite reasonably suppose that the sun would be farther from us than the moon; because, while the moon is, as it were, given to Earth for her own especial benefit, the sun is the centre of a whole family of worlds, our earth being only one among many. The sun pours out heat and light upon other planets, as well as upon us, and he has to occupy a central position, for the benefit of all. Some planets are nearer to him than we are, and some are much farther away.

The sun's distance from us "straight as a crow flies," is nearly 93 millions of miles!

To picture to ourselves even 1 million miles is not easy; and 93 millions, whether of miles or of ought else, are almost hopeless. The following comparison, if carefully studied, may be a help.

We have already imagined a train, going steadily at the rate of 50 miles an hour, never pausing or slackening night or day, travelling direct through Earth's centre, from the north to the south pole, and accomplishing the whole journey in *less than a week*.

The same train, at the same unceasing rate of speed, might pass round the whole earth, at the equator, in *nearly three weeks*.

The same train might travel through the moon's diameter, from the moon's north pole to her south pole, in *about two days*.

The same train might travel through the sun's centre from pole to pole, always keeping the same speed unchanged, in *nearly two years*.

The same train might travel round the outside of the sun, at the sun's equator, in *something under six years*.

The same train, passing through space, from earth to moon, would arrive in *less than seven months*.

The same train, passing through space,

from the earth to the sun, would arrive in *two hundred and ten years*.

Now you may form a tolerably clear idea how it is that the sun and moon seem to be so nearly of a size, while in reality so different. The greater size and brilliancy of the sun are counterbalanced by his immense distance; the smallness and dimness of the moon are counterbalanced by her nearness.

Our earth shines, as the moon shines, by reflection of the sun's radiance. One main difference between a planet and a star—or in other words, between a world and a sun—is that stars or suns shine by their own intrinsic radiance; while the light of planets or worlds is, generally speaking, derived from the sun. Our sun is a star, and all true stars are suns. The world on which we live is a planet, and all planets are counted to be worlds; while the little attendant planets, commonly called moons or satellites, really belong to the same category.

The Solar System, to which reference has been more than once made, consists chiefly of the great central sun, the earth and other planets, the moons belonging to some of those planets, an unknown number of comets, and countless hordes of meteorites.

Of the planets, those which we can most frequently and easily see are Venus, Jupiter, and Mars. Venus has sometimes been called "Earth's Twin," because it is nearly of the same size as Earth, and also it is comparatively near,—not so near as our moon, but not so far as most of the planets. "Evening Star" is a name often given to Venus; though in reality she is no star but a world like our earth, shining only by reflection.

Next to Venus in size and brilliancy comes Jupiter. In apparent size I mean, for in real size Jupiter is a huge globe; not, indeed, to be compared 'or a moment with the sun; but bigger than Venus or Earth, as an apple is bigger than a pea. Jupiter has four beautiful little moons, which may be easily seen through a common opera-glass on any clear night when this planet is visible. A fifth and much smaller moon has been lately discovered.

Venus has a position nearer to the sun than ourselves, and Mercury is nearer still. Farther away than we are is the "red planet Mars," and Jupiter lies at a great distance beyond Mars; while farther still, divided by mighty gulfs of space, are the planets Saturn, Uranus, and Neptune. Between Mars and Jupiter lies a belt of very numerous small planets named the Planetoids.