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Of Knowledge: The Solar System

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Of Knowledge: The Solar System

With these definitions determined as far as **it** is necessary to our purpose, we may now proceed with the investigation of man's knowledge of the universe, beginning with his knowledge of the solar system, that is the sun and the group of worlds held in balance by its and their mutually attracting and repelling forces.

The Sun. The sun is the most conspicuous object to the knowledge of man external to the earth, and with it he forms an early acquaintanceship—it becomes a childhood consciousness. Its brightness, together with its welcome glow of warmth, make it a conspicuous object of knowledge. The regularity of its “rising” reaching high noon, and slowly declining to its “setting”; all this not only makes the sun a conspicuous and wonderful object of knowledge, but constantly renews it for us, until one may say truly that it is the most conspicuous object of knowledge external to the earth. Its wonderfulness grows upon us the more we become acquainted with it. From our present knowledge, developed through long years of observation by men, the sun is regarded as an immense spherical mass of substance aflame, with a diameter approximately of 888,000 miles; while the earth which we regard as so large has a diameter approximately of only 8,000 miles! The circumference of the sun would be its diameter $\langle ? \rangle$ multiplied by three—that is 2,664,000 miles; while the earth, to us so large, is but 24,000 miles in circumference! So large is the sun that its mass is said to be equal to 750 times the mass of all the planets and their satellites (moons) of the solar system. How large such a mass is will better appear after what is to be said of these planets is set down.[†]

[†]“List of Points on Doctrine in Question by the Committee [of the Quorum of the Twelve],” written before May 15, 1930, noted: “Size of the sun—figures do not agree with other figures.”

The sun, as already stated, is the center of a group of planets or worlds held by attracting and repelling forces in regular movement about the sun in orbits determined by the operation of these forces. These planets so far as we now know are eight in number; but moving between the orbits of two of them are what are called the asteroids, apparently a swarm of fragments of a world or worlds broken into bits. Little is known of the nature of them, but they move in a fixed course between the orbits of two of the planets, Mars and Jupiter.

Mercury. The first of the planets of the solar system, first in nearness to the sun, is Mercury. Its mean distance from the sun in moving around its orbit is 36,000,000 miles; its diameter is 3,030 miles; its sidereal period, the time required to move in its orbit around the sun, is 87.96 days. The axial revolution of Mercury—the revolutions upon its axis which determines the length of its days, is uncertain. Mercury has no satellites.

Venus. The second planet of the solar system is Venus. Its mean distance from the sun in moving around its orbit is 67,000,000 miles; its mean diameter is 7,700 miles; its sidereal period is 224 days; the axial revolution is uncertain; it has no satellites.

Earth. The third planet of the system is the Earth. Its mean distance from the sun is 93,000,000 miles; its mean diameter is approximately 8,000 miles; its sidereal period is 365 days; its axial revolution is practically 24 hours; it has one satellite.

Mars. The fourth planet is Mars. Its mean distance ~~of miles~~ from the sun is 141,000,000 miles; its mean diameter is 4,230 miles; its sidereal period approximately 687 days; its axial revolution is 24 hours, plus; it has two satellites.[†]

Jupiter. The fifth planet is Jupiter. Its mean distance from the sun is 463,000,000 miles; its mean diameter approximately 87,000 miles; its sidereal period 4,332 days, plus; its axial revolution approximately 9 1/2 hours; it has five satellites.

Jupiter is known as the “giant planet” of the system, and here we have an opportunity for comparison with the Earth, which will give us opportunity to form some notion of the great masses of the separate planets, and the greatness of the planetary system. Our Earth for example is but 93,000,000 miles from the sun, and that we think of as an enormous distance; but how insignificant it is in the comparison with the distance of Jupiter from the sun which is 463,000,000 miles! Our Earth which we think of as so large has a diameter of only 8,000

[†]“List of Points on Doctrine in Question,” also noted: “The number of sidereal days of Mars should be checked; also of Jupiter and Saturn.”

miles; while Jupiter's diameter is 87,000 miles! Our Earth requires only 365 days, plus, to make the complete circuit around the sun, but it requires Jupiter about 4,432 days to circle the sun! This comparison will suggest to the reader-student the making of other comparisons with the remaining planets of the system, and with the same amazing result of a constantly growing consciousness of the immensity of these respective planets, the distances that separate them from each other, and their immense distances from the sun.

Saturn. The sixth planet of the solar system is Saturn. Its distance from the sun is nearly double the mean distance of Jupiter from the sun, being 886,000,000 miles; its mean diameter, though less than Jupiter's, is still 71,000 miles; its sidereal period is 10,756 days, plus; its axial revolution 10 hours, plus. Saturn has eight satellites, which distinguishes it, in addition to the well known and beautiful bands of seeming light which circle the planet, giving it the distinction of "the most beautiful world of the planetary system," while its eight moons circling it in regular order, make it appear almost as a miniature solar system by itself.

Uranus. The seventh planet of the system is Uranus. Its mean distance is more than double the distance of Saturn from the sun, being 1,781,000,000 miles; its mean diameter is 31,900 miles; its sidereal period 30,686 days, plus; its axial revolution is uncertain; it has four satellites.

Neptune. The eighth planet is Neptune. Its mean distance from the sun is 2,791,000,000 miles; its diameter is 34,800 miles; its sidereal period is 60,181 days, plus; its axial revolution is uncertain; so far as discovered, it has but one satellite.

In order that the above information may be more clearly visualized, I place it in tabulated form at the close of this chapter.

The solar system to be a basis for future comparison. All these particulars respecting the solar system are set down here, not with the idea that something new or special is being given out about the solar system, for the writer very well knows that all this is but the commonest knowledge of the grade and the high schools; but this common knowledge is here set out for the purpose of bringing home to the readers and the students of this book the consciousness of the immensity of that scale on which the solar system is drawn, that it may become a sort of measuring wand by which, through comparisons, we may form some judgments of the still greater immensities to be considered when dealing with the sidereal or star system of the universe. All this consideration of the greatness and the extent of the solar system,

and the still greater vastness of the sidereal system, is in order that the reader student may appreciate somewhat the greatness of the theme upon which we are entering, the search for the heart of all this, the master secret of all; its soul! God!*

Solar System^a

Names of the Planets	Mean Distance from the Sun in Mill. of Miles	Mean diameter in Miles	Sidereal Periods in days around orbits	Axial Revolution in hours	No. of Satellites
1. Mercury	36.0	3,030	87.96	uncertain	0
2. Venus	67.2	7,700	224.70	uncertain	0
3. Earth	92.9	7,918	365.25	23.56	1
4. Mars	141.5	4,230	686.95	24.37	2
Asteroids					
5. Jupiter	463.0	86,500	4332.580	9.55	5
6. Saturn	886.0	71,000	10,759.22	10.14	8
7. Uranus	1,781.0	31,900	30,686.82	uncertain	4
8. Neptune	2,791.0	34,800	60,181.11	uncertain	1

The Sun: Mean diameter in miles, 888,000. The mass of the Sun is 750 times that of all the planets and moons of the solar system added together.

*Roberts attached to the end of this chapter an article, "The Latest News from Pluto," *Literary Digest* (September 6, 1930): 18.

^aRoberts kept a draft of this chart in the front of his copy of the Bible. Much of his data is, of course, now obsolete.

Further references recommended by Roberts for this lesson: "Any standard work on astronomy"; Gillett and Rolfe, *First Book in Astronomy*; Newcomb, *Popular Astronomy*; Thomson, *Outline of Science*, vol. 1; Todd, *New Astronomy*, esp. for experimental demonstrations of astronomical subjects; Phillips and Steavenson, eds. *Splendour of the Heavens*.