

ASTRONOMY AND OUR SOLAR SYSTEM

BY AN EMBRYO ASTRONOMER.

The science of astronomy is necessarily a science of great difficulty and magnitude for its comprehension has perplexed the minds of men, even of the rarest geniuses.

Proctor and other astronomical writers have made successful efforts to explain the problems of astronomy, so that now, in this age of progress, an ordinary mind can read certain works on this interesting subject and learn something about the "celestial bodies, their magnitude, motions, distances, periods of revolution, eclipses, order, and of the causes of the various phenomena."

Astronomy is the most ancient of all the sciences. Some of the observations made by the Chaldeans, date as far back as 250 years B. C. or only 55 years after the flood. It has been said that the Chinese made observations 1100 years B. C., and a conjunction of Mars, Jupiter, Saturn and Mercury is mentioned in Chinese records as occurring 2000 years B. C.

The first astronomer was Spherias and herdsman; for they would naturally observe the movements of sun, moon and stars, while watching their flocks through the night.

The first regular teacher of astronomy was Thales, one of the seven wise men of Greece, who taught B. C. 600 years; Anaximander, a disciple of Thales, was the successor of the school of Pythagoras, B. C. 543. Anaximander had some idea of the daily revolution of the earth, and is said to be the first man to construct a map and a globe.

Some of the thoughts advanced by ancient astronomers were good; while others were sublimely ridiculous. For example, Pythagoras, a Greek philosopher, greatly enlarged the science. He taught that the sun was the center of the planetary orbits; that the earth floated unsupported in space, and that the distant stars were worlds and probably inhabited. In fact, he taught the system which immortalizes the name of Copernicus.

Pythagoras, an Egyptian philosopher, said that the earth was located in the center of the universe and was at rest; that the sun, moon and stars revolved around it, from west to east, in a circle, once in every 24 hours. Ptolemaic theory was generally believed for something over 13 centuries.

About the year 1543, Copernicus, a Prussian astronomer, revived and improved the theory of Copernicus. Copernicus maintained that the earth was a sphere of a globe, and inhabited on all sides. He also taught that the apparent westward revolution of sun, moon and stars was caused by the rotation of the earth on its own axis, and that the sun was the center of the system, including our solar system.

We can safely say, therefore, that the Copernican theory, as simplified by the great German astronomer, Kepler, is the true one; for by it eclipses of the sun and moon are explained, and astronomers are able to predict their commencement, duration, etc., to a minute, even hundreds of years before they occur.

In the year 1633, a ludicrous incident occurred in which Galileo figured rather prominently. He Galileo figured rather prominently in the movement of the earth. On June 22, 1633, he was compelled to make the following renunciation: "I, Galileo, in the 70th year of my age, on bended knees before your excellencies, confess with my eyes and touching with my hands the Holy Gospels, I curse and detest the error of the earth's movement." As he left the court he said to have stamped upon the earth, and exclaimed: "It moves, after all."

The solar system is composed of the sun, planets, moons, comets and meteors. Five planets besides the earth, can be readily seen by the naked eye, and were known to the ancients. These are Mercury, Venus, Mars, Jupiter and Saturn. These, together with the sun and moon, make up the seven planets known to the ancients, and from which the seven days of the week were named.

A sun is a luminous body, consequently it gives out light. It is generally speaking, all stars are suns, or at least, they are an opaque body, or one that is not self-luminous, and derives its light from a sun. But it has become customary to call the seven planets by their own names, and to call the other planets by their own names, when in reality, they are not.

One way to tell whether a body is a star or a planet is to see if all stars (or suns) twinkle, while planets do not, because their light is only reflected.

The sun is the center of what is termed the solar system—the father, as it were, of a great family of planets and planetoids which have been revolving around him for centuries. But perhaps it is better to think of him as a huge magnet, toward which all the planets, planetoids and comets are attracted. The sun's diameter is estimated to be 860,000 miles and circumference 2,900,000 miles. The mass of the sun is over 700 times that of all the planets and moons in the solar system.

The sun turns once on its axis every 25 days, and is journeying through space, according to Professor Simon Newcomb's calculation, toward a star called Vega, in the constellation of Lyra. It is estimated that the solar system is being carried in a northerly direction at the rate of a little over 10 miles per second.

Several theories have been advanced as to what constitutes the sun. The first attempt to solve this mystery was made by Alexander Wilson in 1774. His theory was that the sun is a dark, spherical globe, and surrounded at different distances by three entirely distinct atmospheres, or gaseous envelopes; the first one is opaque, therefore possesses no light in itself; the second is a perpetually burning gas, and constitutes the sun's atmosphere; the third is transparent in appearance, and in combination with the first is a means of reflecting the light received from the second, while other astronomers claimed the sun to be a solid globe.

It is now generally believed that the sun is mainly a ball of gas or vapor, powerfully condensed at the center, and that its brilliancy may be ascribed to incandescent particles of matter. It is now generally thought of the sun as an immense sea of light, or, perhaps more properly speaking, a carbon light. And how magnificent it appears! He said Professor Emil Isenhardt, "If some one should stand on a crown of glory on an open quenchy earth at its every rising and setting. What a bleak and uninhabitable planet would our earth be were we deprived of the life-giving shafts of light, now dispensed with such a lavish hand by old 'King Sol'! Man, animals and all plant life would cease to exist."

The principal planets over which the sun exerts its mighty influence, are eight in number, and may be divided into two distinct groups; the first and nearest to our earth, and other planets are grouped about the sun. The earth has one, the moon; Jupiter has a train of four; Saturn, of eight; Uranus, eight, and Neptune probably has one or two.

observation and inquiry; but it remained for Sir Isaac Newton to define this law, viz., the law of universal attraction or gravitation.

We will now describe briefly each planet of this wonderful system in their order from the sun. First, comes Mercury, which is about 30,000,000 of miles from "Old Sol"; its diameter is about 3000 miles. Being so much nearer the sun than the earth, the attraction is stronger; Mercury, therefore, makes the revolution of the sun sooner than does our earth, or in 88 days, which is the length of Mercury's year. His day is about the same length as ours.

It has been ascertained by observations of Mercury during its "transit," or when it crosses the sun's face, that it has an atmosphere; one will then naturally suppose that it is inhabited. This planet is seldom seen with the naked eye, owing to its nearness to the sun.

Venus is next in order. As seen from the earth, she is the most beautiful and brilliant of all the planets. She is about 30,000,000 of miles from the sun.

Earth is the planet we inhabit. It is about 93,000,000 of miles from the sun. It is the only planet in our solar system which is known to be inhabited.

Mars is the next planet in order. It is about 140,000,000 of miles from the sun. It is the only planet in our solar system which is known to be inhabited.

Jupiter is the next planet in order. It is about 480,000,000 of miles from the sun. It is the only planet in our solar system which is known to be inhabited.

Saturn is the next planet in order. It is about 950,000,000 of miles from the sun. It is the only planet in our solar system which is known to be inhabited.

Uranus is the next planet in order. It is about 1,920,000,000 of miles from the sun. It is the only planet in our solar system which is known to be inhabited.

Neptune is the next planet in order. It is about 2,880,000,000 of miles from the sun. It is the only planet in our solar system which is known to be inhabited.

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WHAT MIGHT HAVE BEEN

IF BRITISH HAD MET FIRST-CLASS POWER INSTEAD OF BOERS.

Inefficiency of London and Line Officers—Need of Thorough Reorganization Pointed Out.

Among the very serious reflections to which the reverses sustained by the English troops in South Africa give rise is the question as to the showing which these same forces would have made if the enemy they have been facing had been the highly trained and up-to-date army of some great military power of Continental Europe, such as Germany, Russia, Austria or France, instead of the irregular levies of farmers who have been commanded straight from the plow, and whose life has been spent until now in agricultural pursuits.

Let us have one year a well-planned and well-executed exhibition of the "Jumbo" industry of the Pacific Northwest, which will show this branch in its most advanced form; which will be an exponent of our great natural resources in this line; which will be a living guide to show the capitalists where to invest his money; which will show the Eastern and Southern lumbermen a profitable and profitable and advantageous, and such a display will have lasting benefits to this and our neighboring states. In another year let us make a show of our "fishing interests," and still in another year or "mining districts," and so on. Perhaps some time in the near future an exposition in this city of the resources and products of our new Pacific colonial possessions is not an impossibility.

Such expositions, if properly managed and properly arranged, will make the producers and manufacturers anxious to show their wares in the most creditable way, because they will only tax them once in a long time. They will see quickly the benefit coming from such an exposition, because, if undertaken in the right spirit and well advertised, it will attract the tradesman in that line and the capitalist from all over the United States. Such an exposition will be a profit beyond calculation to the whole Pacific Northwest.

It does not matter in which order the exhibits are made, whether lumber or fishing or mining or any other industry in the first year. I only desire that the Chamber of Commerce, the board of trade and other organizations take this matter under consideration and then act together in harmony toward one object; the advancement, progress and upbuilding of this Pacific Northwest.

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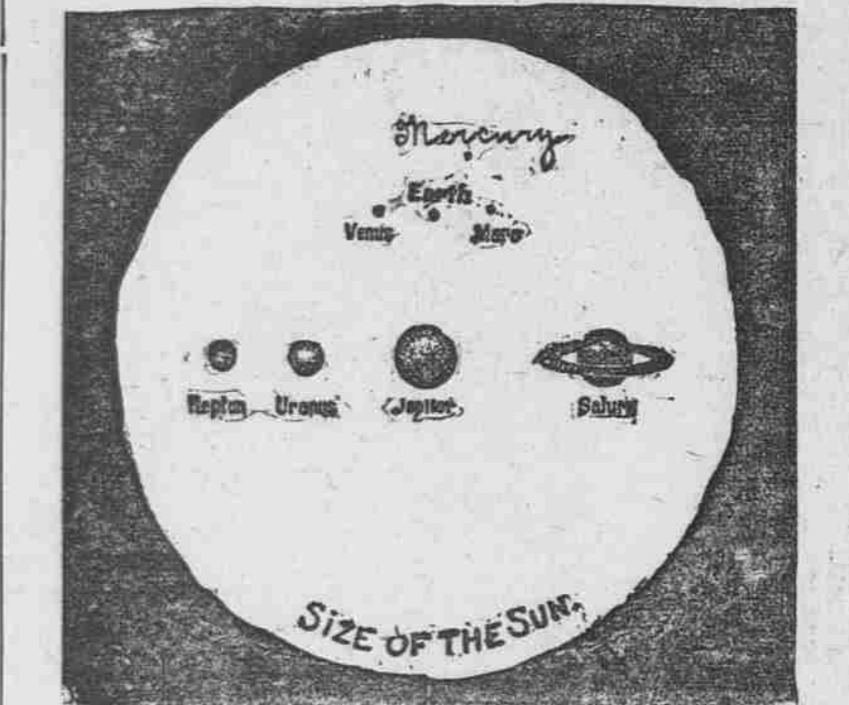
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SIZE OF THE SUN COMPARED WITH THAT OF THE LARGER PLANETS.

the same size as our earth; for this reason they are sometimes called "twins." Its distance from the sun is about 69,000,000 miles. Its day is about half an hour shorter than ours, and her year is nearly 225 days. Both Mercury and Venus show phases like the moon.

The "transits" of Venus are few and far between. Two "transits" occur within eight years of each other, and then follows an interval of over 100 years before another occurs; the dates of the most recent being 1874 and 1882. These "transits" are of one time, important matters; for by them was calculated the sun's distance from the earth; other means are now employed to make this calculation.

After Venus is our earth. Its diameter is 8000 miles; circumference, 25,000 miles, and is distant from the sun about 93,000,000 miles. Its diameter is 100 times smaller than the sun's, and it would take more than 1,500,000 little earths like ours, rolled into one huge ball, to make a body equal in size to the sun.

The earth has three distinct movements. First, it makes the 24-hour revolution upon its axis, which we term one day. Second, it revolves around the sun once in 365 1/4 days; this we call one year. Third, it follows the sun in its wonderful journey through space.

NO GENERAL EXPOSITION. But Exhibitions From Year to Year of Special Lines of Industry. PORTLAND, Jan. 6.—(To the Editor.)—The Portland exposition has for the last few years fallen in its original object of being an industrial representation of the Pacific Northwest. This is wrong, because

talent where to invest his money; which will show the Eastern and Southern lumbermen a profitable and profitable and advantageous, and such a display will have lasting benefits to this and our neighboring states. In another year let us make a show of our "fishing interests," and still in another year or "mining districts," and so on. Perhaps some time in the near future an exposition in this city of the resources and products of our new Pacific colonial possessions is not an impossibility.

Such expositions, if properly managed and properly arranged, will make the producers and manufacturers anxious to show their wares in the most creditable way, because they will only tax them once in a long time. They will see quickly the benefit coming from such an exposition, because, if undertaken in the right spirit and well advertised, it will attract the tradesman in that line and the capitalist from all over the United States. Such an exposition will be a profit beyond calculation to the whole Pacific Northwest.

It does not matter in which order the exhibits are made, whether lumber or fishing or mining or any other industry in the first year. I only desire that the Chamber of Commerce, the board of trade and other organizations take this matter under consideration and then act together in harmony toward one object; the advancement, progress and upbuilding of this Pacific Northwest.

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What might have been if British had met first-class power instead of Boers. Inefficiency of London and Line Officers—Need of Thorough Reorganization Pointed Out.

Among the very serious reflections to which the reverses sustained by the English troops in South Africa give rise is the question as to the showing which these same forces would have made if the enemy they have been facing had been the highly trained and up-to-date army of some great military power of Continental Europe, such as Germany, Russia, Austria or France, instead of the irregular levies of farmers who have been commanded straight from the plow, and whose life has been spent until now in agricultural pursuits.

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