anything beyond a yardstick. Sir Walter Scott was called stupid as a child, and it was not even considered to his credit that he was fond of "sic trash" as ballads, and could learn them by heart at any time. That boy, who really worries you *by being so much unlike* his bright brothers, may be the very one who will make you proud and happy some years hence. Take that for your comfort.

THE WONDERS OF ASTRONOMY.

CHAPTER III.

THE GREAT DISCOVERY.

PERHAPS the question presents itself to the thinking reader: If it be true that the heavenly bodies attract each other, *why do not the planets attract one another in such a manner that they will run round and about each other?*

Newton himself proposed this question; he also found the answer. The attractive power of a celestial body depends upon its larger or smaller mass. In our solar system the sun's mass is so much larger than that of any of the planets, that the balance of attractive power is largely in his favor; hence the revolving of the planets around him. If the sun were to disappear suddenly the effect of the attractive influence of the planets upon one another would be tremendous. There can be no doubt that they would all begin to revolve around Jupiter, because that planet has the largest mass. To give some examples in figures,—the sun's mass is 355,499 heavier, while Jupiter's is but 339 times heavier than that of the earth. It is evident that, the sun's mass being more than *a thousand times* larger than Jupiter's, so long as the sun exists the earth will never revolve around Jupiter.

Yet Jupiter is not without influence on the earth; and although he is not able to draw her out of her course round the sun, yet he attracts the earth to some extent. Observations and computations have shown us that the earth's orbit around the sun, owing to the attraction of Jupiter, is somewhat changed, or, as it is called, "disturbed."

As with Jupiter and the earth, so with all the other planets; their mutual attraction disturb their orbits round the sun. In reality, every planet revolves in an orbit which, without this "disturbance," would be a different one. The computations of these disturbances *constitutes a great difficulty in astronomy*, and requires the keenest and most energetic studies ever made in science.

Perhaps some of our readers may ask here, whether in course of time these disturbances will become so great as to throw our whole solar system into confusion? Well, the same question was proposed by a great mathematician named Laplace, who lived towards the end of the last century. But he himself answered the question *in an immortal* work, "The Mechanics of the Heavens." He *furnished the proof*, that all disturbances last but a certain time; and that the solar system is constructed so that the very attractions by which the disturbances are caused, produce at the end of certain periods, a regulation or rectification; so that in the end there is always complete order.

After what has been said, it is evident that if one of the planets were invisible, its presence would still be known to our naturalists, on account of the disturbances it would cause in the orbits of the other planets; unless, perhaps, its mass to be so insignificant as to render its power of attraction imperceptible.

And now we may proceed to explain the subject of this chapter.

Up to the year 1846, when Leverrier made his great discovery, it was believed that Uranus was the most distant planet revolving around the sun. Uranus itself was discovered by Sir John Herschel in England in the year 1781. As this planet takes eighty-four years to go round the sun, its complete revolution had not yet been observed in 1846; in spite of this, however, the course of Uranus was calculated and known very precisely, because the attractive force of the sun was known; and all the disturbances that might influence the planet were taken into account.

But notwithstanding all the nicety of calculations, the real course of Uranus would not at all agree with the one computed. At that time already long