THE SUN SPOT THAT COULD SWALLOW UP A HUNDRED WORLDS.

A Celestial Explosion and a Small Earth May Have Shot Into Space.

Prof. Garrett P. Serviss Explains the Strange Commotion in the Sun.

The Azoic Age. The Paleozoic Age. A Sketch of the Great 100 Thousand Mile Sun Spot by Prof. Serviss. The Mesozoic Age. The Cenozoic Age.

THE FOUR AGES OF THE EARTH'S EVOLUTION.

By Prof. Garrett P. Serviss.

THE immense group of sun spots which suddenly attracted the attention of astronomers last week, presenting an appearance well calculated to awake awe and wonder on this terraqueous atomy, is still visible, but now the rotation of the sun on its axis has carried the wonderful phenonmenon from the centre to the western edge of the solar disk, where it will disappear; perhaps to come into sight again in about a fortnight, when the sun will have turned the same face toward us once more, perhaps never to be seen again.

The appearance on the sun of a group of black spots so large that no telescope is required to show them is a thing of comparatively rare occurrence, particularly just at this time, when the mysterious cycle known as the "sun-spot period" is nearing its minimum phase, and when, consequently, the surface of the solar orb shows few evidences of violent disturbance. Suddenly, in the midst of this quiesence, a tremendous upheaval has taken place, and the face of the sun shows the effects by marks that are plainly visible to the naked eye ninety-three million miles away.

The present group of sun spots has a maximum diameter of about 100,000 miles—an area large enough to swallow up a hundred planets like our earth.

It is no small thing to look upon the work of an explosion that would not merely have split a mountain, not only have swallowed the Alps, not simply have licked up the Pacific Ocean in a gulp of steam, not have stopped with shattering Europe, Asia, Africa, America into indistinguishable ruin, but which had power enough to turn the whole world to chaos! Anybody who looked at the largest black centre in that group of sun spots saw how big the earth would appear at the distance of the sun. Into that fearful chasm our globe could have been dropped without touching its blazing walls. Out of it could have come, so far as the question of size is concerned, another earth as large as this, bounding into sudden existence like Minerva born from the forehead of Jove.

And this leads me to a question that has been addressed to me for a reply. Was a new world actually ejected from the sun when that great spot was formed, and is that new born planet now careering in space, and rushing earthward, perhaps, bearing direful fate upon its spinning front? The idea that such a thing has occurred, or could occur, is no doubt based upon a theory put forth last Summer by Professor Corrigan to the effect that the phenomena of sun spots indicated that the sun was about to give birth to a new planet, and that the disturbances accompanying such planetary birth would probably have a disastrous effect upon the earth. That theory has since been erroneously ascribed to me. As a matter of fact I do not believe in it at all. I think that the sun long ago—millions of years ago—passed the planet-bearing period of its existence, and that even when it was capable of giving birth to planets it did not do so by explosion or ejection.

There is nothing that we know about sun spots which could lead us to think that even the largest of them—and those now visible belong to the first magnitude—would be able to cast forth a sufficient quantity of matter to form a planet in the sense which is ordinarily attached to that word. The sudden separation from the sun (supposing such a thing possible) of a body as massive as the earth would probably convulse the whole globe of the sun, and might well be accompanied by thermal and electrical disturbances that would traverse the ether with lightning speed and produce more or less serious consequences on our planet. Certainly no such separation or ejection occurred when the sunspots now visible were formed.

On the other hand, it is true that the formation of great sunspots is frequently, perhaps always, accompanied by explosive action of the most violent character, and masses of the material of which the sun is composed are hurled away from it with velocities sometimes sufficient to free such masses from the sun's immediate control, somewhat as a discharged projectile is freed from the cannon out of whose mouth it has issued. And it is not improbable that these masses are sometimes as large as, or even larger than, the earth. But the material of which they consist, instead of being solid, like rock or metal, is gaseous. It comprises, no doubt, such things as iron and other metals, but they are so heated, and consequently expanded, that they float like clouds around the sun. We must remember that in the sun no solid that we know could remain in the solid state. There everything is in the form of blazing vapors. A volcano liquefies rock, but the sun vaporizes it.

Consequently, while it is possible that a mass of matter has been ejected from the sun within the past week which equalled the earth in size, yet since that mass must have been in a gaseous or vaporous condition it would not weigh a millionth part of the weight of the earth, and, as it cooled, it would rapidly contract until, instead of a thing as big as a world, it would become simply a meteor. That a meteor, or a giant's handful of meteors may just have been shot from the sun, can be granted without doing violence to scientific probability. And it is also within the range of possibility that that meteor, or some of those meteors, may reach the earth. The chance of their coming direct to the earth would be very small. There are too many perturbing attractions to be escaped, and too careful an adjustment of the original aim to the resultant effects of the sun's rotation, and of the earth's motion in its orbit, would be required to make it easy for the sun to strike a bull's-eye on earth. Yet, undoubtedly, a meteor, born from the sun, could, sooner or later, reach the earth. By the time it got here—and that time might be measured by days, weeks, months or centuries—it would have cooled and solidified. If it survived the blaze of heat caused by the friction of its rush through the atmosphere it would reach the surface of the ground. It might commit "a celestial crime," as a recent story writer has imagined, by slaying a human being in its fall. And, in the end, it might rest on a shelf in a museum and furnish the text for a learned lecture on the wonders of space and the mysterious relations of suns and worlds. Lieutenant Peary's great meteorite may thus have had its birth from the sun, furnishing, as it dropped upon the snowy coast of Greenland, the closing chapter in the story of a sun spot.

There is much captivating food for reflection in the fact that since the sun is composed of materials precisely the same, in nature, as those which constitute the earth, everything that it may now give forth in the shape of meteoric bodies can, in a certain sense, be likened to a little planet. The earth is the child of the sun, born untold millions of years ago, when the sun was so large that it filled the entire circuit of the earth's orbit. The brood of a sunspot, evanescent in duration and insignificant in magnitude, are no less children of the sun, and akin to the earth, though born in a different manner and formed for a different fate.

And the difference in the history of the earth and of a meteorite is largely a mere matter of size. The cooling of the earth has required tens, and perhaps hundreds of millions of years, and the various stages through which it has passed have left indications that are yet discernible in the rocky strata of the globe. Being so massive, the cooling earth was able, by its gravitation, to retain an atmosphere of vapors and permanent gases which enwrapped it while its other constituents solidified into rock. As the rocky shell cooled, the steam that filled the atmosphere above condensed and descended in the form of oceans. That was the first great geological age—the Azoic, or Age without Life.

But, as the heated rocks and simmering seas became cooler, the earliest germs of animated existence appeared, and geologists still find some of their remains in the rocks of the Archaean Age, or the Age of Beginning Life. No man has yet discovered whence those germs came. Evidently they were locked up in the original man when the sun gave it birth, and, as the time ripened for them, they manifested their presence and their power.

Once started they multiplied and developed and produced new forms and varieties with marvellous rapidity, until in the next great age, the Paleozoic, or Age of Ancient Life, the earth had begun to swarm with living beings.

Then followed the Mesozoic Age, or the Age of Middle Life, when the planet was overrun with wonderful reptilian monsters, whose remains to-day strike the beholder with awe as he gazes upon their restored skeletons, towering thirty feet high, in some museum of paleontology.

After that was the Cenozoic Age, or the Age of Recent Life, whose latest period is sometimes called the Psychozoic era, or the Age of Mind; because, since its dawn, the brain has become the master force in physical existence, and man has appeared to lead the procession of animal life.

Now, all these things have been possible to the earth because it was born large, and none of these things are possible to a meteor because it is born small. A meteor has some of the elements, and we can imagine one possessing nearly all the elements that form the earth and its inhabitants; but a certain mass, or quantity of matter, must be aggregated into one body before the physical laws by means of which a world is developed are able to operate. Once the sun could give existence to masses of that magnitude and potency, and when it was able to do so the earth and the other planets were born; now the sun, at rest, can only shoot forth meteoric bodies, sterile through their dwarfyness, and emphasize its impotence with the exhibition of yawning chasms that give out only vacuous clouds.

Yet in parting with its ability to produce worlds, the sun, in consequence of its condensation, has acquired what for us is now of supreme importance—the power to nourish them with life-supporting rays.

GARRETT P. SERVISS.

Romantic Courtship in Far Away Japan.

Japan is a long way off, and this charming story of how courtships are carried on among the elite of the society of the land of the rising sun has not been confirmed by travellers, yet it is pretty enough to be true.

In certain districts in houses wherein reside one or more daughters of a marriageable age, an empty flowerpot, of an ornamental character, is encircled by a ring and suspended from the window or veranda by three light chains.

The Juliets of Japan are, of course, attractive, and the Romeos as anxious as those of other lands. But instead of serenades by moonlight, and other delicate ways of making an impression, it is etiquette for the Japanese lover to approach the dwelling of his lady bearing some choice plant in his hand, which he boldly, but, let us hope, reverently, proceeds to plant in the empty vase. This takes place at a time when he is fully assured that both mother and daughter are at home, neither of whom, of course, is at all conscious that the young man is taking such a liberty with the flowerpot outside their window. This act of placing a pretty plant in the empty flowerpot is equivalent to a formal proposal to the young lady who dwells within.

The youthful gardener, having settled his plant to his mind, retires, and the lady is free to act as she pleases. If he is the right man, she takes every care of his gift, waters it and tends it carefully with her own hands, that all the world may see the donor is accepted as a suitor. But if he is not a favorite, or if stern parents object, the poor plant is torn from the vase, and the next morning lies limp and withered on the veranda or on the path below.

A Bottle Sure to Be Destroyed.

There are fifty inventions on the market under the name of non-refillable bottles. The design is to protect proprietary articles like sauces, or famous liquors, by making it unfeasible to refill the bottles and thus gain the benefit of the labels. An ingenious Philadelphian proposes to accomplish this by blowing a coin in the body of the glass bottle, and he thinks that this will be tempting enough to induce some one to break the bottle as soon as it has been emptied.