

The Democratic Sentinel

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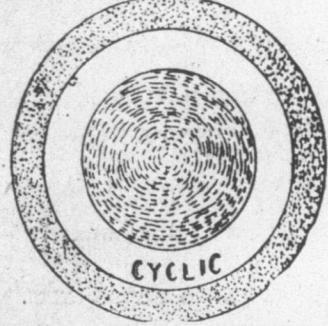
EARTH'S EVOLUTION.

THE PLANET FROM ITS BIRTH TO ITS PRESENT STAGE.

The Fire Period and the Stage of Water—Appearance of Dry Land—Beginning of Life—How the World Looked at Different Periods.

From a lecture recently delivered at Chicago by Mr. Oliver H. Richmond, the following interesting story of the earth's evolution is taken:

The evolution of the earth from the point where it ceased to be a part of its mother sun, at the time when it is a full-fledged world in its own right, cannot but be an interesting theme to persons of intelligence. We will take this infant, after a few millions of years had elapsed. The ring of matter which parted from the sun about 64,000,000 years ago, had slowly folded itself into a disk, thick in the middle and thin, comparatively, at the outer edges; ready to form itself, under the unerring law of nature into a small system. Of but little importance to the universe was the forthcoming insignificant globe and satellite, but of the greatest importance to the countless millions of beings who were des-



THE EARTH IN A GASEOUS FORM, WITH THE RING OF LUNA.

tined to evolve upon the surface of one or the other of these tiny specks.

We need no engraving to present to our sight the thinly distributed mass of matter, for the place was as near being a dark void as we can conceive.

The disk, which a million miles wide in its diameter, must have contained matter attenuated to at least one-eight-hundredth the density of air. In other words, space occupied by it was a greater "void" than the most perfect vacuum practicable by our knowledge. Yet, strange to say, even in this state represented a condensation of matter that had been going on for thousands of millions of years, extending back to a period long anterior to the birth of Neptune. Our first view of Terra exhibits her as a dark, pale, sombre, planet like Saturn, except that the ring is not composed as with Saturn, and the planetary matter had not condensed to near the

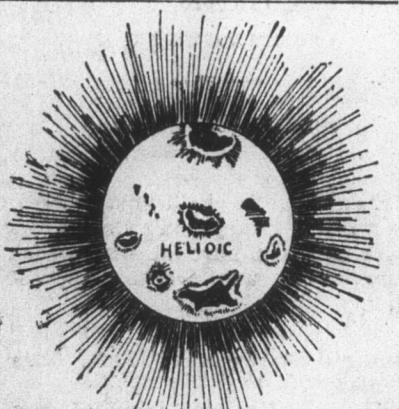
extreme.

The Birth of the Moon.

Our earth, at the stage shown in engraving No. 1, was about 445 times greater in mass than the ring of Luna, but probably must have been still far less than that of water. The moon having parted from this infant earth we will leave her to fulfill her own density, become an inhabited globe, with sea and continents, mountains, land and lakes, and afterwards die out to a cold and airless rock as we now behold her, a fit type of what our earth is to become in the fullness of time.

Whilst our gentle attendant was passing through her cycle of life, she presented an equal brightness, shining luminously to warm and vivify her. The brightest and largest of these suns, apparently, because so much nearer to her, was the one upon which we now reside.

"A sun, say you?" Yes, a sun. For we are living and moving upon the ashes of a



THE EARTH AS A SPOTTED, BLAZING SUN.

dead sun—upon the storm-beaten and earthquake-shaken mass of cinders left from the dying out of a small sun. Enormous gashes now appear upon the surface, well advanced in size. Herence we see. Not surface had become yellow, while many spots obscured her fair face. These spots were vast masses of scoria, which had become slightly cooler and had in many places assumed a comparative to the more condensed material of the core of the body. Around these "islands of red-hot lava" gigantic cyclones of fire swept and swirled, while the war of elements was so great that a mass of basaltic rock the size of Rhode Island might have been tossed about as a small pebble. This period had been 13,000,000 years since she parted from the parent sun; still, she is an infant.

Two million years ago past, and we view her once more in No. 2. All is not a change. The blisters we saw so long ago have increased until they have inclosed her melted interior with a shell of lava; red-hot about her equator; gray and dark about her poles, always turning poles. Why is this? You ask. Let me explain. Under the well-known principles of gravitation, a retarding and centrifugal force, a floating body on a circularly moving surface will seek the parts that move with the least velocity, even as chips floating in a tub of water will seek the outer edge. When the water is whirled about the tub with a stick. Therefore, the poles became loaded with masses of cooling rock ages before the equator became cool enough to become red. Up to this time the central sun, although blotted out, still gave out a present power, but had little effect upon the earth, because her own heat was so great. But now the cooling process was to go on more rapidly at the poles by reason of the slant rays of sun upon them. So the crust



gradually thickened and hardened at these points, while it was constantly cracked and fissured by enormous upheavals and the bursting forth of the pent-up matter within.

A Belated Planet.

The engraving shows the earth in this stage of fire as a belated planet like Venus; the belt being composed of dark masses of carbonic acid, mingled with carbonic gas and other gases. It was formed a belt about the equator 1,000 miles in thickness and extended nearly to the poles. That belt contained the future seas and oceans, the coal beds and rich earth that were millions and millions of years later to render the earth fit for man.

These carbonic and hydrogen vapors

were constantly condensing, as they came in contact with the intense cold of outer space, thereby becoming precipitated to the hot earth below, to again be sent flying upward in the form of steam and gas. This produced a constant rain night and day for more than 300,000 years, and a period of time when rain storms were violent and almost constant for millions of years more.

Our world being now formed in the shape of a ball slightly flattened at the poles, we will watch it during its further development, for a grand and mighty work



OUR GLOBE IN ITS EARLY STAGE OF LAND FORMATION.

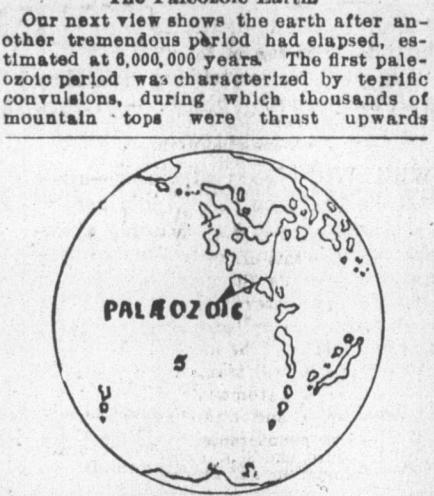
must yet be done upon her by the forces of Vulcan before she can become the abode of man. Who has left her astronomical history and must begin upon her geological career.

We first behold her as an azotic earth 20,000,000 years later, during which period mighty changes have taken place. The crust has cooled, and is now white. But it is covered with marshy miles of stone. But the pent-up fires within are constantly heaving and gushing upward through vast rents in the warm rock. Were it not for this the level earth would be covered with water. Impregnated to saturation with carbonic acid, it is to the depth of several feet. But the contraction of the crust under the cooling process has folded up great ridges of rock, and has thereby lifted it above the terrible abyss of water so that dry land appears. But what an inferno! The earth is now 10,000 feet thick, granite rock a thousand miles from the birth of a new continent, the first one south of the Arctic Circle.

America, called the "New World," is geologically the old. "We may say," says Agassiz, "that the continents and seas are upon the granite ridge that first divided the waters into a northern and a southern ocean, and if our imaginations carry us so far, we can look down to its base and fancy that sea washed against this granite ridge of 10,000 feet." A little land at the poles, a V-shaped strip extending from the north polar land downward to where Lake Superior now is, and from thence northward to the Arctic Sea, together with a few islands widely scattered, are the only land in the widest ocean. That is the azotic earth 28,000,000 years ago.

The Paleozoic Earth.

Our next view shows the earth after another tremendous period had elapsed, estimated at 6,000,000 years. The first paleozoic period was characterized by terrific convulsions, during which thousands of mountain tops were thrust upwards



THIRD STAGE OF LIFE—THE GREAT INLAND SEA PERIOD.

surface was concerned. Previous changes were mostly beneath the waters, but a grand fashioning of the land must now take place.

The Cenozoic time is divided into two great periods, the tertiary and the quaternary. The tertiary is subdivided into three grand periods, called the miocene, the pliocene, and the pleistocene. The post-tertiary extends upward through the glacial epoch and the terrace epoch.

We cannot stop to relate the wonderful animal life which developed upon the land during the Miocene and Pliocene periods, but we will examine the geographical changes. During the millions of years which supervened we find that the great sea of the Americas was born of the rising of great miles of rock in the north. Then the sea grew smaller and smaller by slow degrees while its salt was deposited slowly in layers upon its bottom until after an enormous time had elapsed the great sea became a comparatively shallow lake, which developed upon the land during the Miocene and Pliocene periods, but we will examine the geographical changes. During the millions of years which supervened we find that the great sea of the Americas was born of the rising of great miles of rock in the north. 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