

THE EARTH'S CRUST.

Pent-Up Forces Underneath Us Which Sometimes Get Uneasy.

The Latest Convictions of Scientific Students Concerning the Peculiar Features of Earth-quakes—Theories.

Prof. George H. Merriman of Rutgers college, New Brunswick, has made the crust of the earth a study, and has written on the subject. He said in a recent lecture:

"While facts enough regarding the extent of the earthquake of Sunday have not come to hand to enable me to speak on the direction of the earth wave or its peculiar features as compared with other earthquakes, yet something may be said as to the latest convictions of students of science on the nature of the earth below the point any man can penetrate. That may lead us to guess intelligently at the cause of earthquakes.

"You know the long received theory of the nature of the interior of the earth was that it is a molten mass, and that we move around on a crust enveloping the earth and caused by the cooling off of this mass on the outside. It is undoubtedly true that about thirty miles below the earth's surface the temperature is so high that everything is in a melted condition. We know this, because we have learned that every fifty feet we penetrate into the earth there is an increase of temperature of about 1 degree and at a distance of thirty miles the heat is so great that any substance we know of would melt. Perhaps the melted mass is in the form of a liquid. That would be certain but for the immense pressure on it. The pressure is estimated at 10,000 tons on a square foot. Of course scientific men cannot experiment with matter at a high temperature with a pressure of 10,000 tons to a square foot, so we can only guess what may be its condition. In talking about this melted mass thirty miles under us the term water substance is used by geologists.

"How great is the distance through this water substance we do not know, but it is certain that its density increases more and more, gradually, until the interior of the earth is solid, probably, from the inconceivable pressure 1,000, 2,000, or 3,000 miles from the surface. Sir William Thomson has demonstrated that the earth must have a core much denser than the land and water we live on. He points out the fact that if a shell only thirty miles thick surrounding a molten liquid mass extending from one side of the earth through the center to the other side, then the moon, through the law of gravitation, would displace the liquid or gas in the interior of the earth to such an extent that the earth's crust would bulge out in the direction of the moon, making a tide in the solid crust of the earth, as certainly as the skin of an orange bulges out when you squeeze the fruit between the palms of your hands. And this would be evident to us because the ocean tides would be almost, if not quite, imperceptible to us. To withstand the attraction of the moon, the earth, Sir William says, must be as rigid as steel.

"So we have the theory that the crust of the earth floats on and imposes an immense weight on a water substance, which is inconceivably hot. Now, as to the way an earthquake may be caused. Suppose moisture trickled gradually, year after year, through this crust into the heated mass. In our atmosphere steam would be produced. Thirty miles below us the pressure is so great that it is not likely that steam could be generated. One thing, though; the pressure of 10,000 tons to the square foot, a pressure exerted in every direction, would be increased. Some effect must be produced down there, and it is easy to see that if one place in the earth's crust is weaker than another near the region where the water trickled in, then 'the weakest place must stand the strain.' It is not unreasonable to suppose that this pressure below might be so great that the earth's covering was shifted a little to adapt itself to the pressure from below. This shifting of the crust is, in fact, the earthquake.

"I believe this theory has the greater reason on its side, because earthquakes are almost always in the region of volcanoes, and volcanoes are almost always in or near the ocean.

"Another theory of earthquakes is that as the earth is very gradually cooling off the crust is thickening on the under side, and cracks or fissures on the under side of the crust many miles deep may occur in consequence of the enormous pressure, so that the water substance runs into a new position with a force that would knock a continent out of shape if it took place on the earth's surface. That notion would be sufficient to produce a vibration thirty miles distant.

"Whatever the cause of the earthquake on Sunday," added Professor Merriman, "I think the earth in the region where it took place has either settled into a new position or is forced back into an old position, from which it was pushed by former earthquakes."

Economical of Space.

[Chicago Times.]

A western circus recently ordered a large advertising poster to be printed, and then looked because there was so much sky in it. "I ain't agoin' to advertise the sky," he said to the lithographer. "I paid you to advertise my show. Drop a few camels and stick 'em up there. I ain't agoin' to have all that gaudy space run waste."

Valuable Deposits.

[Exchange.]

At Bresha, I. I., the German settlers have made some valuable discoveries. In the so-called "purple barrens" they have found deposits of peat, marl, fine clay, black-clay, and kasha. In excavating the clay beds tools and Indian arrow-heads have been found, indicating that these were worked by the aboriginal inhabitants of America.

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[Chicago Herald.]

The latest telephone dispenses with electricity altogether. Its diaphragm is split willow or other wood closely woven, dried and varnished. The drying contracts the fibers and produces a very high tension. In the center of the diaphragm is a strong copper wire to which the wire is attached. For distances less than two miles the new telephone conveys sound better and more distinctly than the old. The difficulty in "switching" the wires, however, limits its use.

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