Lost continents found deep underground as old as Earth shed light on planet's formation

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Continents 4.5 billion years old, entombed nearly 2,000 miles underground, predate the formation of the moon and could shed light on how everything we know today came to be, according to new research.

The ancient masses lie about 1,800 miles under Earth's surface, near where the mantle and the outer liquid core meet. One is under Africa,

and the other is under the Pacific Ocean.

Researchers have long known that the two bodies of solid rock existed, but the seismic imaging that revealed them could not furnish enough detail to tell geologists what was setting them apart from the material around them, according to the American Geophysical Union's blog.

Scientists used to surmise that deeply embedded, separated continents lodged deep in Earth's mantle were ocean plates that had been subducted, or shoved underneath the edge of a competing plate. But the new findings indicate that they "may have been formed from an ancient magma ocean that solidified during the beginning of Earth's formation," the researchers' statement said. Moreover, these distinct, humongous hunks of rock may have survived intact after the massive collision that tore off part of the nascent Earth to create the moon, as detailed by London's Natural History Museum—making them as old as Earth itself.

The Earth's crust, which is the part we live on, is "like the skin of an apple," explains Oregon State University. It's between 3 miles and 5 miles thick under the oceans, and about 25 miles thick under the continents. The other layers—there are four—get denser and hotter the deeper you go.

The lost continents are located between the second and third layers, the researchers said, encircling the liquid outer core. Scientists had plenty of samples from the inner core, thanks to volcanic rock that bubbles up in places like Hawaii and Iceland, as Live Science noted. Those are identifiable by the ancient isotopes—atom formations unaltered by the oxygen at Earth's surface—such as helium 3 that they carry.

By retracing these rocks' paths to the surface, they realized that these rock columns, rather than rising straight up as originally thought, drifted. This shed new light on these continents' relationship to the surface, and

shed light on Earth's origins, the researchers said.

Thus the new research, tantalizingly, could connect the dots between the inner and outer data, as Science Alert explained.

"We had all of these geochemical measurements from Earth's surface, but we didn't know how to relate these geochemical measurements to regions of Earth's interior," geologist Curtis Williams from the University of California, Davis, and the study's lead author, told the AGU's GeoSpace blog. "We had all of these geophysical images of the Earth's interior, but we didn't know how to relate that to the geochemistry at Earth's surface."