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Our growing Earth?

Put aside that stuff about continental drift and tectonic plates explaining the world as it is, and consider a globe that may be getting bigger all round like a pumpkin on a vine

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The world is awash with wild theories, conjecture and speculation about everything you could imagine — and then some. However, one theory that popped up some time ago stands out due to its unexpected curiosity: Earth is enlarging — in the way a pumpkin both balloons and adds mass.

Could this theory offer one simple explanation for the current distance between Earth's continents, and the death of the dinosaurs — without involving a Hollywood-size asteroid — and turn the long-held notion of India smashing into Asia on its head?

Is it merely a coincidence that you can reassemble the continents into a single supercontinent that would encase a much smaller Earth?

Growing Earth Theory says yes, yes, yes — and no; geology is not big on coincidences.

Though much of the theory is routinely ignored or dismissed by mainstream scientists, as its specifics reveal themselves, a nagging awareness persists that "dismissed" does not mean "disproved."

Indeed, the prevailing explanation of how the continents came to be where they are today — Plate Tectonics Theory — was also generally dismissed by mainstream science until well into the 1950s.

That theory, incidentally, draws on much the same data as Growing Earth Theory.

Plate Tectonics Theory assumes the Earth has been about the same size since it was created some 4.5 billion years ago out of material thrown across space in the so-called Big Bang 13.7 billion years ago.

That assumption has gained further traction due to a lack of evidence that our planet may have been smaller or may be growing according to the 18th-century Kant-Laplace nebular hypothesis about the formation of our solar system in an ever-expanding universe.

On the other hand, as its name suggests, Growing Earth Theory has it that the Earth has grown over the eons — and indeed is still doing so.

Moving picture: This NASA image from Apollo 17 in December 1972 shows the first view of the south polar ice cap as well as almost the entire coastline of Africa, and the Arabian Peninsula at the top of the picture. A newly opened oceanic rift through the Gulf of Aden has been pushing the Arabian Peninsula and the Horn of Africa apart over the past 20 to 30 million years. AFP-JIJI

Start by taking a look at the complex makeup of this planet we inhabit.

Earth is 40,000 km around the Equator. It has a solid iron-nickel inner core measuring about 70 percent the size of our moon. Around that inner core swirls an outer core of liquid metal, about 2,260-km thick, that generates Earth's magnetic fields. This is all encased in a 2,980-km thick blanket of magma — semisolid rock kept just below its melting point by tremendous pressure bearing down on it from what is called the mantle.

At points of weakness in this solid rock mantle, magma melts due to the reduced pressure and then escapes through it to the surface in a volcanic eruption. This is followed by the magma's cooling or crystallization as it gradually becomes an additional part of Earth's relatively thin crust.

The mostly granite crust beneath the continental land masses is around 3.5 billion years old and averages 60- to 100-km thick, though it is deeper in some places. It is either resting on, or rooted into, the mantle.

The crust beneath our oceans, however, is markedly thinner and younger. Consisting mostly of dense basalt (volcanic rock) and gabbro (crystallized basalt), it is only about 8- to 10-km thick and 200 million years old at most.

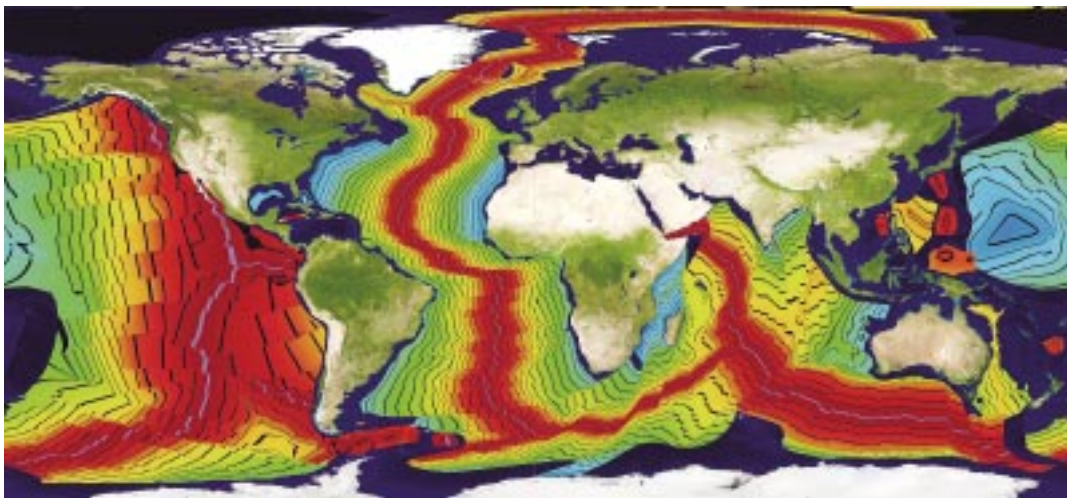
Meanwhile, under our oceans and running almost entirely around the planet is a 65,000-km-long network of volcanic rifts, through which new volcanic material is being continuously added in an accepted process called sea-floor spreading.

However, scientists favoring Plate Tectonics Theory maintain that this new material is not actually new, but is material that is recycled in a theoretical convective cycle called subduction.

This cycle posits that the tectonic plates are moving and that they force the material down from the surface (or the mantle) back into the molten magma blanket — from where it eventually re-emerges. This analysis allows the surface of the planet to remain the same size.

The problem with Growing Earth Theory, mainstream scientists say, is that it would require the creation of brand new matter — a mechanism for which they claim has not been confirmed and therefore is not accepted as happening.

However, it probably doesn't help that it also leads to a reassessment of the planet's very evolutionary nature and, with it, humankind's rise to dominance.



Oceans of data: This map, using radiometric data compiled by the U.S. National Oceanic and Atmospheric Administration, illustrates the process by which the ocean floors have been created within the last 200 million years. Pink and red indicate the most recent additions; greens followed by blues are the oldest. Detail added by researcher Neal Adams' Continuity Associates breaks the growth into 10-million-year sections. Humans have existed on Earth only during the time indicated by the pink lines. NOAA / CONTINUITY ASSOCIATES

All that aside, Growing Earth Theory, summarized in detail from here, is really quite simple and even explains a number of paleontological mysteries — but beware: this is the stuff many dismiss.

The theory has it that, since the Archean Eon some 3.5 billion years ago, our planet has been ever so slowly growing in size and mass — and expanding radially outward like a balloon being inflated.

In fact the theory states that, over the past 200 million years, Earth has approximately doubled in size and the rate of growth has also been slowly accelerating.

During the Permian Period, from 300 million to about 250 million years ago, the annual rate of growth cited by the theory's proponents was about the width of a human hair. Currently it is estimated to be about 22 mm a year — or some 2.2 meters every century. Certainly, widespread measurements have confirmed that the equator is expanding, but tectonic-plate theorists attribute that to what they call "polar flattening" — without explaining the rationale for that.

Growing Earth Theory, however, winds the clock way back to when a supercontinental granitic crust was covering a half-size Earth like the shell of an egg.

There were no large mountains or deep oceans in those times, just shallow seas, although about 70 percent of the surface was covered, as now, by water.

Then, when the growth of the underlying mantle (due to forces not yet agreed upon), became more than the supercontinental crust could take, the volcanic fissures started to appear. These are the fissures that now underlie the ridges we see today in all the world's oceans.

We know that from these oceanic rifts there spews a continuous outpouring of volatile gases, mineral-rich water and molten rock up from the mantle — magma, just like from a volcano — which, when exposed to cold ocean water, crystallizes to begin forming a new, thinner crust.

In the accepted process of sea-floor spreading, constantly erupted material settles and starts forming new crust while at the same time pushing older material away from the ridge with the helpful pull of gravity. All of our oceanic basins were formed this way.

As this volcanic spreading pushed the continents apart, Growing Earth Theory has it that most of the ancient seas drained off the land masses and started forming the oceans.

Indeed, it also holds that the volume of water, which, in a hydrogen-rich universe is readily produced (Enceladus, a moon of Saturn with a diameter of just 600 km, spews water from its southern pole), has increased in proportion to the amount of Earth's growth — just as the planet's gravity has increased along with its increased mass.

In terms of mountain building, too, it's interesting that none of the large, nonvolcanic mountain ranges on our planet, such as the Alps, Andes or Himalayas, are more than 100 million years old.

In terms of geological time, that makes them quite recent arrivals.

However, rather than attributing their formation to what would be an improbably rapid movement leading to the collision of tectonic plates — or to ancient shields (like that of the Indian subcontinent) breaking loose from the mantle and sliding about — Growing Earth Theory puts their formation down to folding and stacking resulting from sea-floor spreading.

This has the effect of flattening the Earth's curvature, but — because the Earth's granite crust is so thick — it tends to retain its curvature as it can't bend or stretch. Then as gravity tries to recurve it to the flattening surface of the growing

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Plate Tectonics Theory assumes the Earth has been about the same size since it was created some 4.5 billion years ago . . . (whereas) Growing Earth Theory has it that the Earth has grown over the eons, and indeed is still doing so.

Dogmas may blinker mainstream scientific thinking

The competing claims of Growing Earth Theory and Plate Tectonics Theory as presented in the accompanying article may appear to be a recent rivalry, but they are in fact following in a long tradition.

Soon after accurate maps of the world were first drawn courtesy of the great European navigations of the 15th to 18th centuries, scholars studying them were struck especially by the facing coastlines of Africa and North and South America that appeared to fit into each other if pushed together.

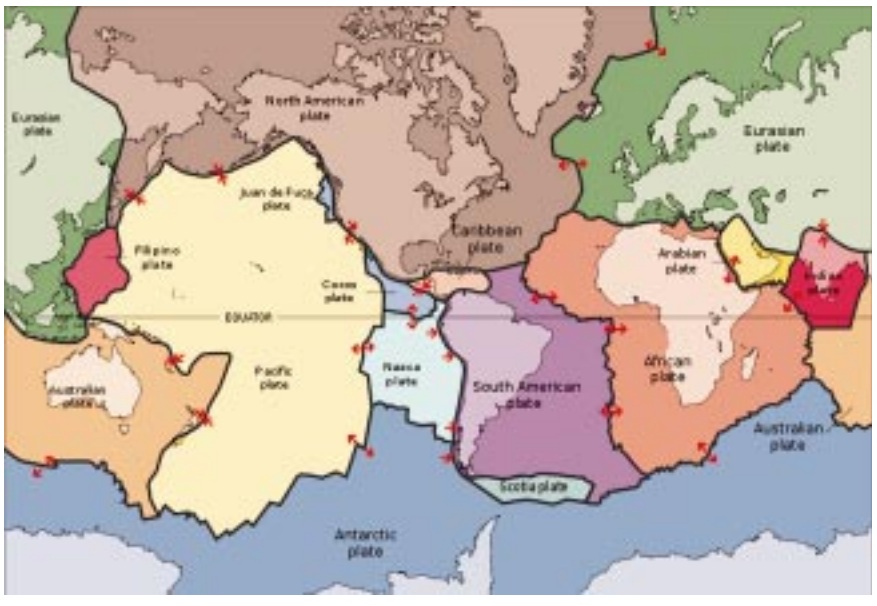
Consequently, they theorized that those continents — and by extension other land masses — were long ago much closer together. Just how long ago, however, was not determined until well into the 20th century.

Back in 1912, a German scientist named Alfred Wegener (1880-1930) published his theory of continental drift, which he believed held the key to answering those questions.

According to this, the land masses were once one giant continent Wegener named Pangaea that was surrounded by water, and they arrived at their present positions by drifting around somewhat like melting ice cubes do on a sheet of glass.

Most of Wegener's evidence was circumstantial and his theory failed to explain the geological mechanism driving continental drift — how, for example, the Indian shield, ancient rock that is essentially welded to the mantle, could break loose and ram northward into Asia and keep on going with such force as to cause the giant ripples now known as the Himalayas.

Wegener's hypothesis was largely forgotten until the 1950s, when it was dusted off and revised to become Plate Tectonics Theory a decade or so later. And that — despite being so complex in its supposed workings and requiring such radical geomorphic change over a very short period of geological time as to render the Earth unique in the whole of our solar system as we know it — became the received wisdom now generally treated as fact.



On a plate: A map of the world showing the boundaries of the 15 largest tectonic plates on the surface of the planet as delineated by Plate Tectonics Theory. The theory assumes the planet has always been about its present size, and that many of its landforms have been created as a result of enormous pressures caused by movements of these plates. U.S. GEOLOGICAL SURVEY

Interestingly, though, it's not so long since science was leaning in favor of a far simpler explanation that followed in the footsteps of those who had centuries before set their eyes on the first world maps.

Scientists such as Otto Hilgenberg (1896-1976) in Germany and Samuel Warren Carey (1911-2002) in Australia, working in the years before World War II, not only noted how the continents bordering the Atlantic appeared to fit into each other if pushed together. They also observed, and made models to show, that the Pacific, Indian and Southern Ocean continents also fitted together — but as one mass entirely covering an Earth half its present size.

Rather than accept this staggering proposition, though, scientists — without being able to refute it — instead latched on to the more comfortable alternative of Plate Tectonics Theory that didn't require any change in Earth's size.

However, that scientific consensus occurred despite oceanic surveys and deep-core sampling in the 1960s that began to plot a 65,000-km-long network of undersea volcanic ridges that run like the seams on a baseball around our planet — and which were found to be in constant and various stages of "eruption."

Advanced radiometric age-dating then revealed something truly remarkable — that the age of the oceans' floors increases symmetrically on both sides as you move away from the volcanic ridges. And yet more stunning, the findings also showed the ocean floors are nowhere more than 180 million years old.

From the results of this research it was a short step for some scientists to postulate a process of seafloor spreading. This holds that new volcanic material erupting from the submarine ridges is constantly forming new oceanic crust which, with the help of gravity, pushes the older crust further away. It was an analysis that seemed to quite adequately explain what enlarged the Atlantic and pushed the Americas and Africa apart.

Hard evidence: This NASA image taken from the International Space Station in 2004 shows Mount Everest in the Himalayas. Plate Tectonics Theory has it that such land forms were pushed up by pressure from colliding tectonic plates; Growing Earth Theory has the pressures coming from rippling of the Earth's crust as rising material widens the ocean floors of the expanding planet. AFP-JIJI

But if this spreading has been happening over geological time from all the ridges, wouldn't that mean the whole planet must be growing in size?

Not necessarily said all those wedded to Plate Tectonics Theory.

In their collective mind, it was — and remains — more feasible that the surface of the planet is made up of crustal plates that are either converging, diverging or colliding with one another, all driven by heat from inside the planet.

In essence, such thinking is an extension of 1929's Theory of Continental Drift championed in the face of widespread skepticism by the English geologist and pioneer of radiometric dating, Arthur Holmes (1890-1965). According to Holmes, it is so-called convection cells in the mantle that dissipate radioactive heat from beneath, which then propels the continents around.

So both the continental drift and plate tectonics theories allow Earth's size to have remained relatively unchanged since its creation.

As far-fetched as the proposed mechanisms behind both these theories may have seemed to some, they gained a new lease of life through the work of seismologists Kiyoo Wadati (1902-95) at the Japan Meteorological Agency and Hugo Benioff (1899-1968) at the California Institute of Technology.

After conducting research independently in the 1930s on deep seismic activity, they theorized the existence of what came to be known as Wadati-Benioff Zones. In these zones, they maintained that tectonic instability appeared to be the result of one piece of

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