

Plate Tectonics: Have the Continents Really Moved Apart?

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Forty years ago, most geologists were adamant that the information they had about the earth could be explained only by the idea that the continents were stationary. Only a handful of geologists promoted the notion that the continents had moved (continental drift), but those believers were accused by the majority of indulging in pseudo-scientific fantasy. Today, that opinion has reversed — plate tectonics, incorporating continental drift, is the ruling theory. (Interestingly, it was a creationist, Antonio Snider, who in 1859 proposed horizontal movement of crustal plates catastrophically during the Genesis Flood.¹)

What brought about such a dramatic about-turn? Between 1962 and 1968, four main lines of independent experiments and measurements gave rise to the remarkable synthesis that today is called plate tectonics:²

(1) mapping of topography of the sea floor using echo depth-

sounders;

(2) measuring the magnetic field above the sea-floor using magnetometers;

(3) timing the north-south reversals of the earth's magnetic field using the magnetic memory of rocks from the continents and their radiometric ages; and

(4) determining very accurately the location of earthquakes using the world-wide network of seismometers originally developed to detect nuclear blasts.

PLATE TECTONICS

The general tenets of plate tectonics theory may be stated as follows.³ The earth's surface crust consists of a mosaic of rigid plates, each moving relative to adjacent plates (Figure 1). Deformation occurs at the edges of the plates by three

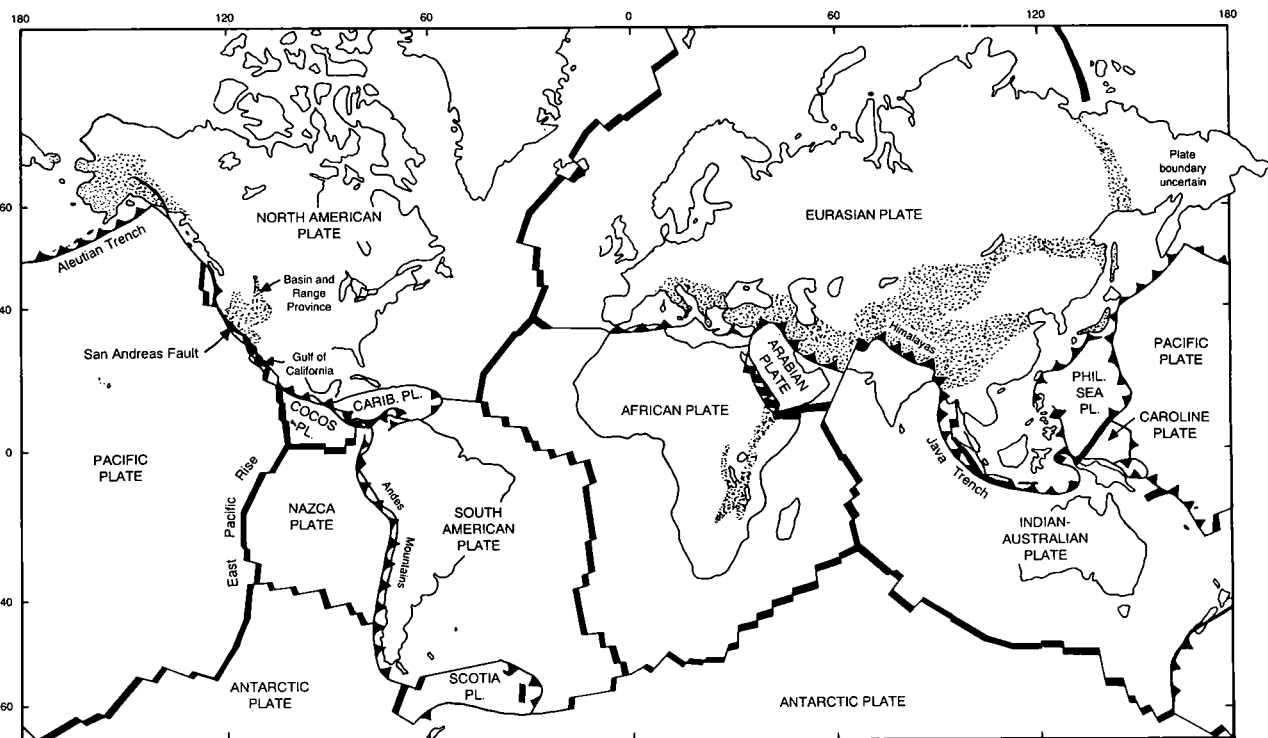


Figure 1. Simplified map showing how the earth's surface is divided into 'plates', some with continents and some without. Spreading is believed to occur along the mid-ocean ridges (heavy lines), sliding along transform faults (thin lines — for example, the San Andreas Fault of California), and colliding where one 'plate' is being pushed under the other one along 'subduction zones' (barbed lines on overriding plate.) Stippled areas within continents are regions of active deformation (for example, earthquakes) away from 'plate' boundaries.

types of horizontal motion: extension (or rifting), slipping, and compression. Sea-floor spreading occurs where two plates are moving away from each other horizontally (for example, the Mid-Atlantic Ridge and East Pacific Rise), with new molten material from the earth's mantle being added between them to form new oceanic crust. Transform faulting occurs where one plate is slipping horizontally past another (for example, the San Andreas Fault of California). Subduction occurs where two plates are colliding, with one plate being pushed under the other, producing compressional deformation (for example, the Peru-Chile Trench and associated Andes Mountains of South America, and the Himalayan Mountains, where the Indian-Australian Plate collided with the Eurasian Plate). In keeping with their evolutionary-uniformitarian assumptions, geologists suppose that the plates move very slowly — about two to 18 centimetres per year. At this rate, it would take 100 million years to form an ocean basin or mountain range.

Almost all geologists today enthusiastically endorse this theory of drifting continents. However, there have been a few very competent earth scientists who have not.^{4,5} Even though their objections are quite numerous and usually ignored, it is important that a few of their main objections be summarized and dealt with here.

FITTING OF CONTINENTS

The idea that the continents can be fitted together like a jigsaw puzzle to form a single super-continent is an old one,

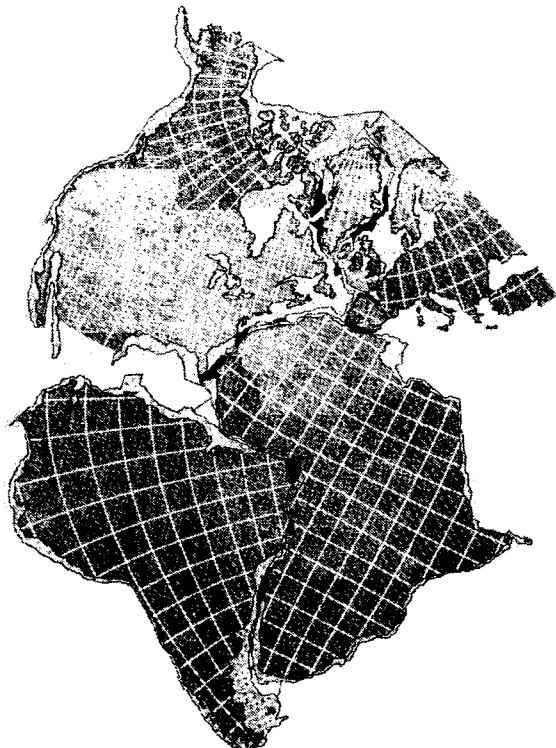


Figure 2. The fit of continents like a jigsaw puzzle using the 500-fathom contour lines at the edges of the continental shelves (black areas are overlaps).

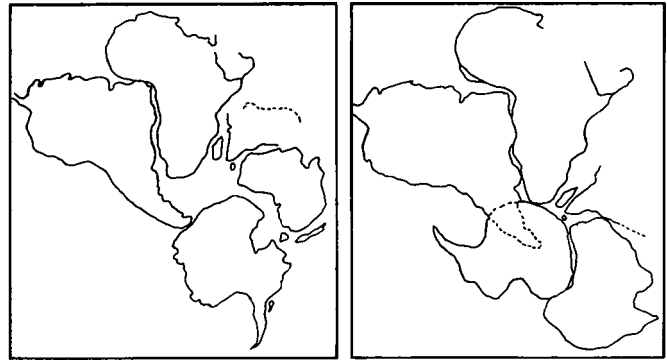


Figure 3. Two attempts at reconstructing the great southern super-continent of Gondwanaland, that is supposed to have broken up and drifted apart.

based on the interesting apparent fit of the eastern bulge of South America into the south-western concavity of Africa. (Antonio Snider noted this in 1859.) Investigators have used computers to try to fit the continents. But even one of the best reconstructions of how Africa, South America, Europe and North America once fitted together⁶ has areas of overlap between these continents, and Central America is omitted altogether (Figure 2)!

There are a number of ways to fit South America, Africa, India, Australia and Antarctica, but if the theory is true, only one can be correct (Figure 3). Some reconstructions have been shown to be geometrically feasible, but they are virtually impossible to explain by continental drift/plate tectonics (for example, rotation of eastern Australia to fit into eastern North America).⁷

Nevertheless, it needs to be kept in mind that the coastlines of continents have been altered by erosion and tectonic adjustments even in recent times, so some discrepancies when fitting the jigsaw pieces back together again can be expected. Thus, due to sea level changes also, some reconstructions use the edges of the continental shelves. However, the primary units that have 'drifted' are the plates, many of which contain continents or continent fragments, but some of which don't, being just oceanic crust, and so geologists today believe that their reconstructions of a former super-continent (or super-continent) are both valid and defensible.

SEA-FLOOR SPREADING

Evidence suggesting sea-floor spreading is the most compelling argument for plate tectonics. In the ocean basins, along mid-ocean ridges, plates are thought to be diverging slowly and continuously with molten mantle-derived material being injected between the plates and cooling to form new oceanic crust. The youngest crust is at the ridge crests, with the rocks becoming progressively older away from the crests. At the time of cooling, some of the rocks' minerals acquire magnetism from the earth's magnetic field. Since the earth's magnetic field is supposed to have reversed numerous times in the past, during some epochs the cooling oceanic crust

should have been reversely magnetized. Thus, if sea-floor spreading is continuous, the ocean floor should possess a magnetic ‘tape-recording’ of reversals (Figure 4). A zebra-stripe pattern of linear magnetic anomalies parallel to the mid-ocean ridge crest has been recorded in many areas, while potassium-argon dating has been claimed to show older rocks are farther from the ridge crest.

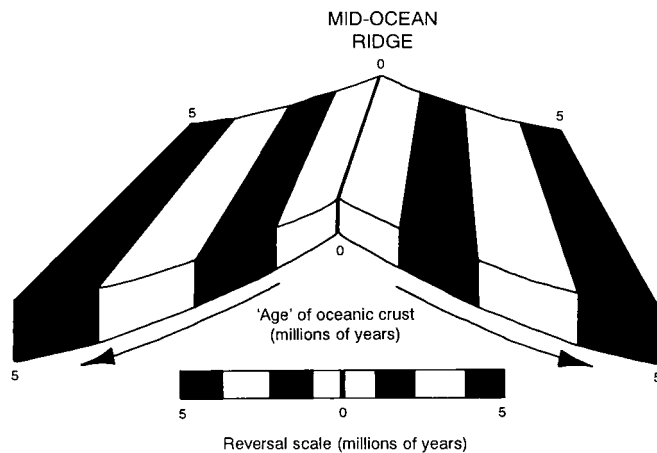


Figure 4. The oceanic crust is like a conveyor belt carrying the record of polarity reversals on both sides of the spreading sea-floor centre at the mid-ocean ridge.

MAGNETIC STRIPES?

However, initially there were some very serious problems with this ‘compelling’ evidence. Rezanov⁸ concluded

‘that paleomagnetic data are still so unreliable and contradictory that they cannot be used as evidence either for or against the hypothesis of the relative drift of continents or their parts.’

Asymmetry of magnetic stripes, not symmetry, was regarded as the normal occurrence.⁹ Vine and Wilson,¹⁰ among the leading early investigators, admitted

‘as ever in the interpretation of magnetic anomalies, there is no unique solution, and the various parameters are so flexible that, having assumed normal and reverse stripes, the model can be fitted to any existing concept of the structure of oceanic ridges.’

Furthermore, it was claimed that the magnetic bands may not always have formed by reversals of the earth’s magnetic field at all, Doell and Cox¹¹ stating that *‘the reversed magnetization of some rocks is now known to be due to a self-reversal mechanism.’* Jacobs¹² also noted:

‘such results show that one must be cautious about interpreting all reversals as due to field reversal and the problem of deciding which reversed rocks indicate a reversal of the field may in some cases be extremely difficult.’

Thus, the Meyerhoffs claimed *‘the so-called magnetic anomalies are not what they are purported to be.’*¹³

Moreover, Hall and Robinson¹⁴ reported on deep crustal

drilling in the North Atlantic Ocean. Drilling of magnetized rocks revealed *‘the absence of the source for linear magnetic anomalies.’* They concluded,

‘It is clear that the simple model of uniformly magnetized crustal blocks of alternating polarity does not represent reality.’

Why? Because the drilling revealed that down the holes

‘a variation of magnetization intensity occurs on several scales from centimetres to tens of metres, and there are no consistent trends with depth.’

Furthermore, there is

‘poor agreement between the sense of the effective magnetization in the drilled holes and the associated linear anomalies.’

In other words, the actual magnetism in the rocks on the sea floor bore little resemblance to the magnetism previously recorded from boats sailing across the ocean surface. Hall and Robinson were forced by the evidence to concede:

‘It is apparent that crustal drilling has shown that the processes of generation and modification of oceanic crust are much more complex than originally thought.’

More recent investigations have confirmed that the alternately reversed zebra-stripe pattern of palaeomagnetic polarities is both real and almost similar in the sea-floor basalts on either side of the mid-ocean ridges, when measured by magnetometers towed across the ocean floor. However, repeated drilling into the ocean-floor basalts has also confirmed that on the small scale these neat patterns are not there, the palaeomagnetic polarity changing in patches down the holes, even though the magnetometers towed across the tops of the drill-holes seem to have recorded the average, or overall trend, of the total block of sea-floor basalt. While these observations still strongly support the concept of sea-floor spreading within the plate tectonics model, the drill-hole random palaeomagnetic patterns contradict the slow-and-gradual uniformitarian interpretation involving polarity reversals, each over a million years or so.

LAND ANOMALIES

Meanwhile, the magnetic properties of rocks have also been measured on land, and it is now well established that there are large linear areas of rock within which are successive stripes of reversed and normal magnetic polarity, as well as successive lava flows that have different magnetic polarities. Humphreys¹⁵ has reviewed the evidence for the validity of these fossil magnetism studies, and found that fully half of all the 200,000-plus geological samples tested at that time had a measurable magnetization whose direction (‘polarity’) is reversed with respect to the earth’s present magnetic field. He concluded that the variety, extent, continuity, and consistency of the reversal data all strongly suggest that most of the data are valid, so that he had no option but to accept that reversals of the earth’s magnetic field must have occurred.

The problem with the interpretation of these magnetic

data is the presumed mechanism for operation of the earth's magnetic field, and thus the presumed vast time-scale for these reversals. The operational mechanism preferred by many geophysicists, the so-called dynamo hypothesis, has many problems associated with it which have been well documented.¹⁶⁻¹⁹ The only viable alternative is the hypothesis that proposes freely decaying electric currents in the earth's core,²⁰⁻²⁴ a mechanism that can account for the magnetic reversals recorded in the rocks having taken place in a matter of only days and years!²⁵ Humphreys predicted that if this hypothesis were correct then evidence of rapid magnetic reversals might be found in lava flows thin enough to have cooled within a few weeks. Soon after, respected scientists Coe and Prévot found such a lava flow with a large portion of a rapid magnetic reversal 'frozen' in it on Steens Mountain in southern Oregon (USA).^{26,27}

POTASSIUM-ARGON DATING

As to the 'successful' dating of the sea-floor magnetic anomalies, such a claim is doubtful. Wesson²⁸ says that potassium-argon (K-Ar) dating, when correctly interpreted, shows no evidence of increasing age with distance from the ridge crest. Furthermore, others^{29,30} have found that the greater argon content (giving older apparent age) of the ocean-floor basalts on the flanks of the mid-ocean ridges can be easily explained by the greater depth and pressure at the time of solidification, incorporating original magmatic argon (not derived by radioactive decay).

Nevertheless, it cannot be denied that K-Ar dating studies of basalts on islands such as Iceland that sit astride a mid-ocean ridge have confirmed the same relative pattern of 'aging' with distance from the mid-ocean ridges.³¹ What the real significance of the 'dates' is, given the unproven assumptions foundational to such 'dating' techniques, plus the propensity for anomalous results, has yet to be resolved within the biblical framework.

SUBDUCTION

A corollary to the idea of plate growth by sea-floor spreading is the notion that converging plates are destroyed below the deep ocean trenches, a process called subduction. The volcanic island arcs and coastal mountain ranges associated with the ocean trenches (for example, the Pacific 'Ring of Fire') are said to result from remelting of the subducted, or underthrust, plate at depths of up to 700 km, while the deep and high-intensity earthquakes in these same areas are assumed to indicate movement and break-up of the underthrust plate (Figure 5).

There have been two major difficulties with the subduction hypothesis. First, if subduction is occurring, there should be compressed, deformed, and thrust-faulted sediments on the floors of the trenches. However, the floor of the Peru-Chile and East Aleutian Trenches are covered with soft flat-lying sediments devoid of compressional

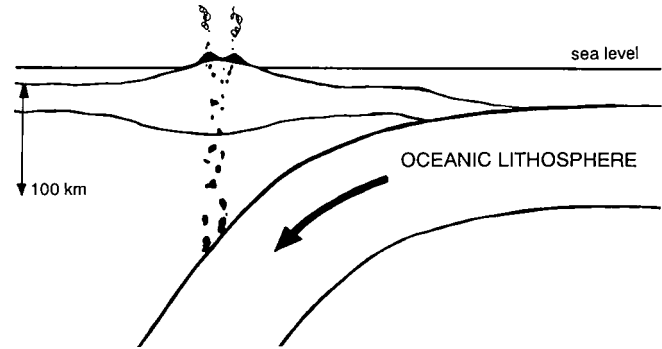


Figure 5. Sketch through a collision or 'subduction' zone. Geologists believe that the 'oceanic lithosphere' (right) or 'plate' of ocean floor rocks is being pushed under the continental 'plate' on the left.

structures.^{32,33} Second, seismic first-motion data indicate that modern earthquakes occurring approximately under trenches and island arcs are often tensional, and only rarely compressional (Figure 6).³⁴ However, both of these apparent inconsistencies may have more to do with subduction having occurred in the past and then having virtually stopped in the present.

THE DRIFT MECHANISM?

What about a driving force for continental drift and plate motion? How is a plate 10,000 km long, several thousand kilometers wide, and 100 km thick, kept in constant but almost imperceptibly slow movement during millions of years? Will slow and continuous application of stress on a plate 100 km thick cause it to be torn asunder? How can a plate be broken slowly and then rammed slowly into the earth's mantle to a depth of 700 km?

Explanations for plate motion have ranged, until recently, from very doubtful to impossible. One popular theory was that slow convection currents in the earth's mantle exert lateral forces on plates, moving them slowly and continuously (Figure 7). But the then best theory of the mantle's viscosity demonstrated that large-scale slow-moving convection cells are impossible.³⁵ Three other theories were sometimes mentioned:—

- (1) plates slide slowly by gravity from the elevated mid-ocean ridges to the depressed trenches;
- (2) plates are 'pulled' slowly into the mantle below trenches by chemical phase changes during melting; and
- (3) plates are 'pushed' slowly apart along mid-ocean ridges by slow injection of magma into vertical cracks.

Each of these mechanisms (alone or together) cannot overcome the viscous drag at the base of the plates, and cannot explain how the difference in elevation developed, or how the plate boundary originally formed.³⁶

DRIFT MEASURED?

An article in *Scientific American*³⁷ suggested that

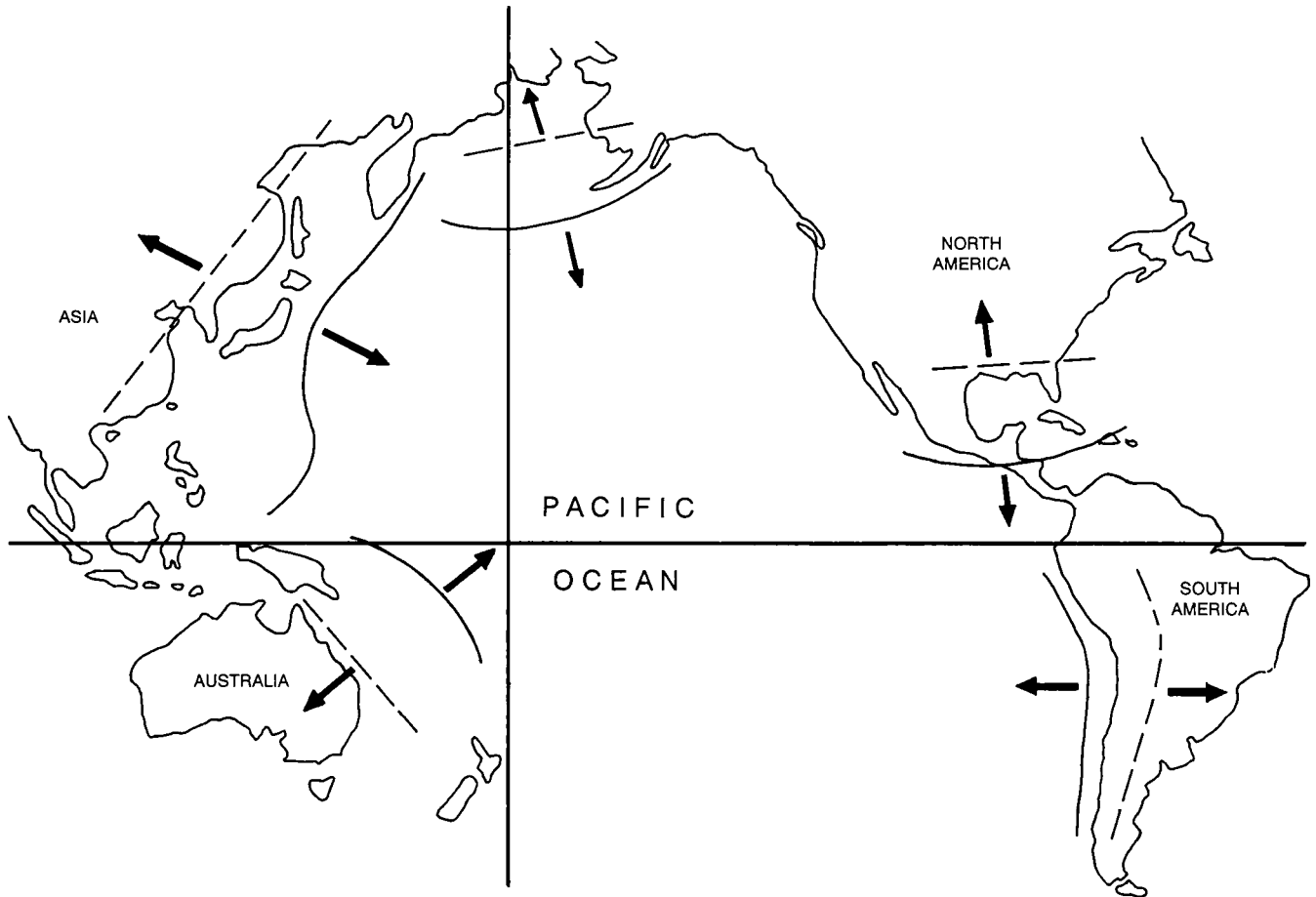


Figure 6. Plate tectonics theory predicts that earthquakes will be compressional along plate collision or 'subduction' zones. However, this sketch map shows that along many of these zones the forces producing earthquakes are tensional (that is, 'plates' are pulling apart)!

measurements have shown the continents are drifting relative to each other. The authors used a map to summarize the results from two sets of observations — their own, between observatories on the Eurasian and North American Plates (which are supposed to be moving apart along the Mid-Atlantic Ridge), and those from NASA, between the Pacific Plate and the Eurasian and North American Plates, respectively, which are supposed to be coming together.

The most obviously impressive thing about these results

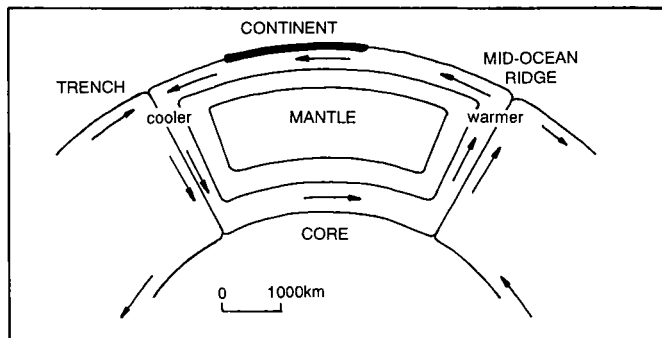


Figure 7. Mantle-wide convection with resulting sea-floor spreading and continental drift as envisaged by earth scientists.

is that in both groups of observations the direction of the apparent movement is that predicted by current theory (see Table 1). However, let us assume that the technique itself is

| OBSERVED (cm/yr) | PREDICTED (cm/yr) |
|---------------------------------------|----------------------|
| (a) Carter-Wilson Observations | |
| +1.1 | +1.7 |
| +1.1 | +1.9 |
| (b) NASA Observations | |
| -8.5 | -9.4 |
| -11.1 | -8.9 |
| -4.4 | -2.3 |
| -3.9 | -5.0 |
| -7.9 | -5.2 |
| -1.9 | -0.7* |

* This was between the Eurasian and North American 'plates'.

Table 1. Comparison of two sets of very-long-baseline interferometry observations with 'plate' motions predicted by computer models of 'drift'.

inherently accurate and reliable, in spite of the fact that the accuracies claimed (*'changes as small as a centimetre in relative positions of points on the earth'*³⁸) are mind-boggling over such distances. The impression is given that the distance has actually been measured as varying by the amounts shown in each case, but the results are given as a **rate**. We are not told how this rate was obtained, how far the plate really moved, and over what period of time.

RANDOM FLUCTUATIONS

The authors say that the technique has been operational for more than a decade, but in January, 1983, **Science News** reported that interferometry had been used to make measurements like this, looking for movement between plates, since 1979, and no one had yet detected any change!³⁹ They make no mention of this, nor do they attempt to give non-drift explanations for apparent changes in the baseline. They do, however, make a very telling admission:

*'... the baseline lengths are increasing at a rate of between one centimetre and two centimetres per year. On the other hand, the baseline lengths also exhibit equally large random fluctuations; hence from these data alone we would be reluctant to conclude that we had really measured plate motions.'*⁴⁰

It appears that far more detail, and probably at least another decade or two of careful observations, would need to be reported before one could begin to reach satisfactory conclusions. It seems just as valid to accept the four years or so of 'no change' reported to 1983 as to accept that drift has been 'actually measured'. That continental drift has been measured has become the popular view, although the authors were commendably cautious:—

*'Once we have accumulated enough observations to be sure the measurements of plate motions are accurate, the measurements will have great value as a check on plate-tectonic theory.'*⁴¹ (Emphases added.)

Unfortunately, they are less temperate elsewhere:—

*'Now we are beginning to measure . . . the baselines . . . getting longer by about a centimeter a year . . . we are watching geology happen.'*⁴²

A CONTRARY RESULT

However, two observatories on the North American continent (in Texas and Massachusetts, respectively) must, if one uses the same sort of approach to the data, be accepted as moving towards one another at a rate of one centimetre a year, even though they are supposed to be on the same **rigid** plate!

This makes nonsense of the claim *'it appears the VLBI (very long baseline interferometry) is indeed capturing plate tectonics in action'*⁴³ when this result is completely contrary to the current plate tectonics theory these 'measurements' are supposed to be capturing 'in action'. The current plate tectonics theory that was used in the computer modelling to

predict what 'drift' values should be observed assumed *'the plates move at a constant rate and move rigidly, so that there is no motion within the plates.'*⁴⁴

By their own admission, therefore, their measurement of contraction of the Texas-Massachusetts baseline within the North American Plate disproves this assumption, throwing into doubt both the computer modelling and aspects of the plate tectonics theory on which it was based.

NEW CLAIMS OF MEASURED DRIFT

New claims were made at a 1989 conference that drift has actually been measured.⁴⁵ David Smith of NASA reviewed the data collected since the late 1970s, via the space geodetic techniques of laser ranging to satellites and very long baseline interferometry (VLBI), and claimed that these measurements are confirming the geological predictions for motions between the major tectonic 'plates'.

However, these results are only from the continuation of the same NASA measurement program as that reported in **Scientific American** and **Science News**, the latter stating in 1983 that no one had yet detected any movements! Now Smith is claiming movements have been measured, but again he reports the results only as a **rate** (for example, 15 mm/yr across the Mid-Atlantic Ridge, 170 mm/yr across the East Pacific Rise, and 28 mm/yr across the San Andreas Fault). But how far have the plates really moved, and over what period of time? We are not told. Smith says only that overall agreement with models of plate motion based on geological data of the past 30 million years is very good, but how much have the evolutionary models of geological data and time influenced the rate interpretations? In any case, the current rates of plate movements may not be representative of past rates, particularly if the distances plates have 'drifted' occurred over a drastically shorter time-scale.

A BIBLICAL PERSPECTIVE

It is well established now that the continents have drifted in the past, but it is not clear whether 'drift' measurements today actually do represent continuing 'drift' or simply minor readjustments. This is important to a biblical view of geology, not because the Bible speaks directly for or against continental drift and plate tectonics, but because in the biblical post-Flood framework, if the continents (with their loads of Flood-deposited, fossil-bearing strata) separated to their present position (for example, at the time of the Tower of Babel, suggested by some because Genesis 10:25 says *'the earth was divided'* in the days of Peleg⁴⁶), the relatively short time involved would lead to enormous difficulties in accounting for the heat energy necessarily dissipated against friction, not to mention the earth movements and destruction at the earth's surface that would result from such rapid continent-wide motion.⁴⁷

However, Baumgardner, working at the Los Alamos National Laboratory, has demonstrated from supercomputer

modelling of processes in the earth's mantle that the only way any form of plate tectonics/continental drift could have occurred is catastrophically.⁴⁸⁻⁵⁰ The key component is what is known as runaway subduction. Once the earth's crust broke up into plates subduction would begin, but the friction generated would be overcome by the heat produced lowering the viscosity of the adjacent mantle material.⁵¹ At its peak this thermal runaway instability would have allowed for metres-per-second subduction.

CATASTROPHIC PLATE TECTONICS

Baumgardner's 'discovery' opens up prospects of a catastrophic plate tectonics global Flood model for earth history⁵² that is able to explain more geological data than the conventional plate tectonics model with its millions of years. Austin *et al.*'s proposed catastrophic plate tectonics model begins with a pre-Flood super-continent ('*Let the waters . . . be gathered together unto one place*', Genesis 1:9) and dense ocean floor rocks. Once the Flood was initiated, it is envisaged that cracking of the ocean floor along thousands of kilometres of pre-Flood continental margin caused the denser ocean floor to sink, leading to metres-per-second thermal runaway subduction. The sinking slabs would of course have displaced mantle rock material, so this rapid subduction process would have automatically initiated large-scale flow throughout the entire mantle. However, as the slabs of ocean floor rocks sank and were rapidly subducted adjacent to the pre-Flood super-continent's margins, elsewhere the earth's crust would be under such tensional stress that it would be torn apart (rifted), breaking up both the pre-Flood super-continent and the ocean floor. Thus concurrent crustal spreading centres would have rapidly extended along linear belts on the ocean floor tens of thousands of kilometres long where the rifting was occurring, while hot mantle material flowing as a result of displacement by the subducting slabs would upwell and rise to the surface along these spreading centres/rifts. On the ocean floor this hot mantle material would degas its volatiles (including copious steam) plus vaporize ocean water to produce a linear geyser of superheated steam along the whole length of spreading centres (perhaps the '*fountains of the great deep*', Genesis 7:11; 8:2), which would have dispersed then condensed in the atmosphere to fall as intense global rain.

This catastrophic plate tectonics model, though still at the developmental stage, nevertheless still has greater explanatory power than its conventional millions-of-years counterpart. For example, the mantle-wide flow would have generated convection within the earth's core, providing the conditions for rapid geomagnetic reversals there. These in turn would be expressed on the earth's surface as many rapid magnetic field reversals,⁵³ and recorded in the cooling mantle material along the spreading centres as the so-called magnetic stripes, though erratic and locally patch, laterally and at depth, just as the data indicates,⁵⁴ even according to the uniformitarian critics already cited. Furthermore, not only

does this model provide the drift mechanism that explains how the plates could move over the mantle, subduct, etc., but it predicts that little or no movement would be measurable between plates today because the drifting virtually came to a standstill when all the pre-Flood ocean floor was subducted. So the trenches of subduction zones today would be infilled by undisturbed late and post-Flood sediments, just as we observe.

Interestingly, aspects of Baumgardner's mantle modelling have recently been independently duplicated and thus verified by others.^{55,56} Furthermore, Baumgardner's modelling predicted that because this thermal runaway subduction of cold ocean floor crustal slabs occurred only recently during the Flood (about 5,000 or so years ago), then those slabs would not have had sufficient time since to be fully assimilated into the surrounding mantle material, so evidence of them above the mantle-core boundary (to which they sank) should still be found today. Indeed, evidence for such unassimilated relatively cold slabs has recently been outlined in seismic studies.^{57,58}

The mechanism for retreat of the Flood waters is also associated with tectonics. Psalm 104:6-7 describes the abating of the waters which had stood above the mountains. The eighth verse properly translated says, '*The mountains rose up; the valleys sank down*', implying that vertical earth movements were the dominant tectonic forces operating at the close of the Flood, in contrast to the horizontal forces dominant during the spreading phase. Plate collisions would have pushed up mountains, while cooling of the new ocean floor increased its density causing it to sink and thus deepen the new ocean basins to receive the retreating Flood waters. It is significant, therefore, that the '*mountains of Ararat*' (Genesis 8:4), the resting place of the Ark after the 150th day of the Flood, are in a tectonically active region at what is believed to be the junction of three crustal plates.⁵⁹

A metre or two of measured movements today is no issue, but if such slow movements are extrapolated back into the past as uniformitarians do, then their conventional plate tectonics model has limited explanatory power. For example, even at a drift rate of 100 mm/yr it is questionable whether the kinetic energy of the collision between the Indian-Australian and Eurasian Plates would have been sufficient to 'push up' the Himalayas. On the other hand, catastrophic plate tectonics in the context of the Flood can explain how the plates overcame the viscous drag of the earth's mantle for a short time due to the enormous catastrophic forces at work, followed by a rapid slowing down to present rates. Imagine then the kinetic energy of plates moving at metres per second colliding — the uplifting of the Himalayas would have been inevitable.

Such continental separation solves apparent geological enigmas; for instance, the amazing similarities of sedimentary layers in the north-eastern United States to those in Britain, but the absence of those same layers in the intervening North Atlantic ocean basin; the similarities in the geology of parts of Australia with South Africa, India and Antarctica, etc.

However, what might have initiated this catastrophic plate tectonics Flood event is not yet clear and many possibilities have been suggested.

CONCLUSIONS

The absence of sufficient mechanism(s) for conventional slow-and-gradual plate motion renders the whole idea of slow-and-gradual continental drift and the uniformitarian theory of plate tectonics untenable, even though the initial uncertainties regarding some sea-floor palaeomagnetism, and the doubts about aspects of subduction zones and trenches have since been overcome by later investigation. One evolutionist once said:

‘Why then do a few crabbed earth scientists refuse to accept some or all of the tenets of the “new global tectonics” ? . . . Strictly speaking, then, we do not have a scientific hypothesis, but rather a pragmatic model, reshaped to include each new observation . . . obviously, this kind of model is not testable in any rigorous scientific sense.’⁶⁰

Such early skepticism about the concept of plate tectonics has been found to be unwarranted, given that such pragmatic models do have explanatory power. Since the Bible does not directly speak for or against continental drift, the possibility of plate tectonics during the Flood cannot be ruled out. Indeed, a catastrophic plate tectonics model for the Flood not only incorporates the demonstrated conventional elements of plate tectonics but delivers and promises greater explanatory power, including evidence not explained conventionally.

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QUOTABLE QUOTE: But Creation is not Science

'He [Sir Peter Medawar, Nobel Prize-winning biologist] says, "Ask a scientist what he perceives the scientific method to be. He will adopt an expression that is at once solemn and shifty-eyed. Solemn because he feels he ought to be clear in opinion, shifty-eyed because he is wondering how to conceal the fact he has no opinions to declare." That's if you ask him, the scientist, what is the scientific method you'll get 72 answers. But this is a special case — these folks [the 72 Nobellists] perceive themselves to be under attack. There is a sort of a group mind that comes together — a mentality of "circle the wagons in defence of our profession". You've got to do this otherwise you're not going to have any luck. And to try to get (let's say) the 72 to sign a brief on (let's say) abortion, which they did try to do (I think they got nine of the 72); I mean they just couldn't get any agreement at all. It's hard to get agreement and Nobellists are particularly very individualistic — big egos, right? So they're clearly doing this because they perceive themselves in defence of their profession.'

— Dr Michael Shermer, prominent American skeptic and anti-creationist, in a series of lectures on 'Evolution v. Creationism: The History of a Controversy' given at the Californian Institute of Technology in 1993 and available from the **US Skeptics Society**. Shermer was referring to the Louisiana Supreme Court creation trial, for which 72 Nobel laureates signed a statement opposing creation science (on the grounds that it did not qualify by accepted definitions of science, scientific method, etc.). Notice Shermer's frank admission of the difficulty in determining what constitutes 'science' anyway, but that this did not deter the Nobellists from unanimously excluding creation.